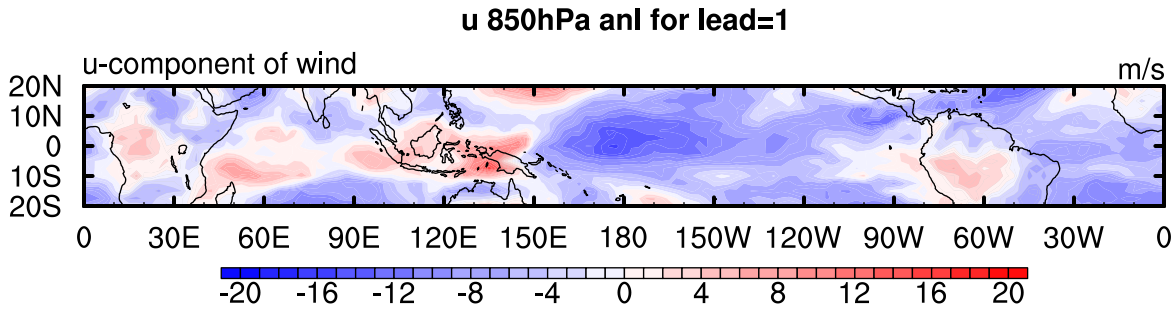
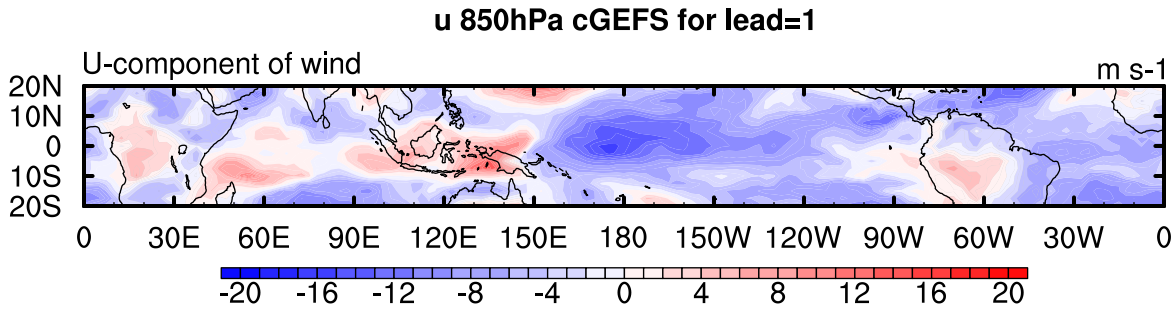
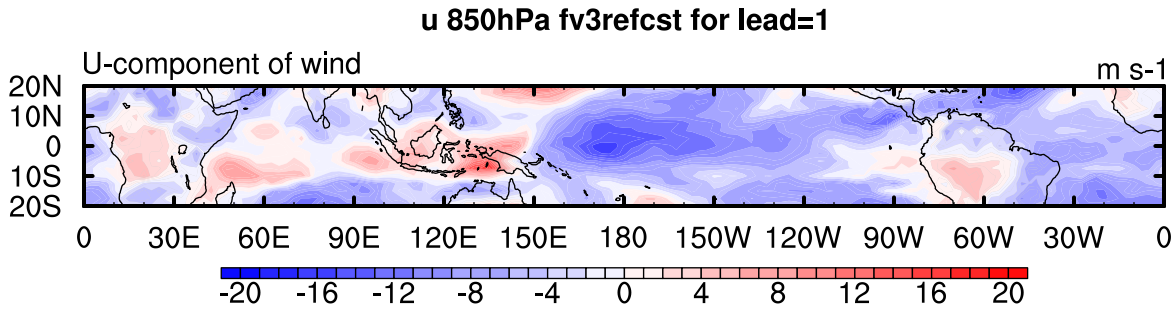
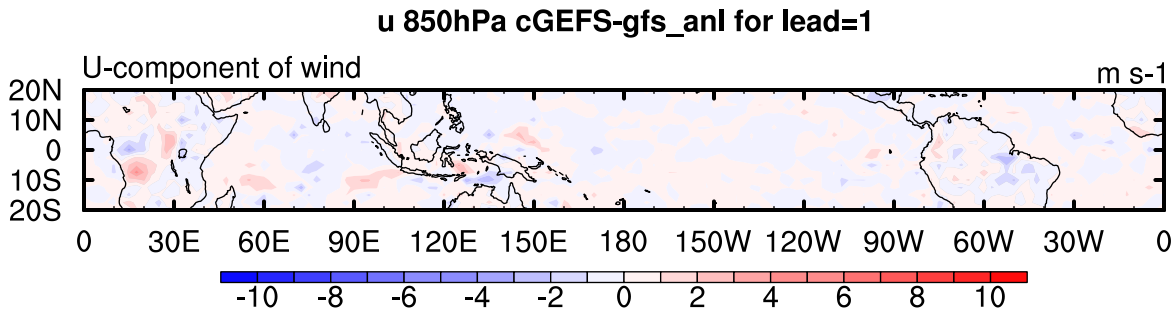
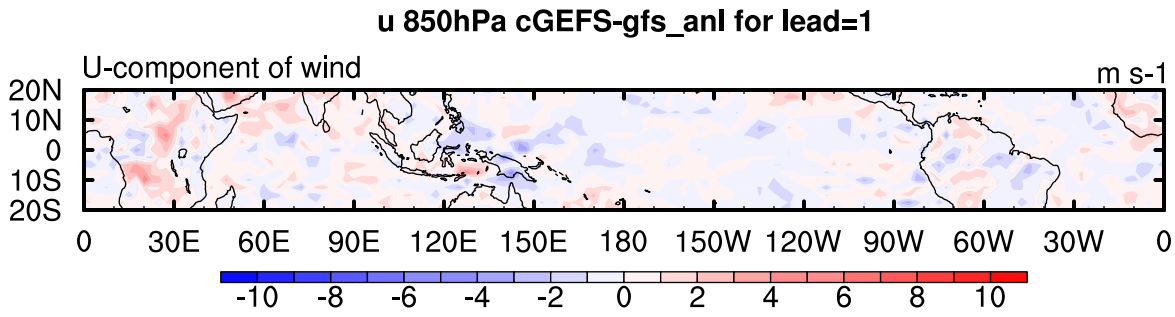

u 850hPa anl for lead=1
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS for lead=1
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa fv3refcst for lead=1
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=1
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 850hPa cGEFS-gfs_anl for lead=1
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-8
-6
-4
-2
0
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8
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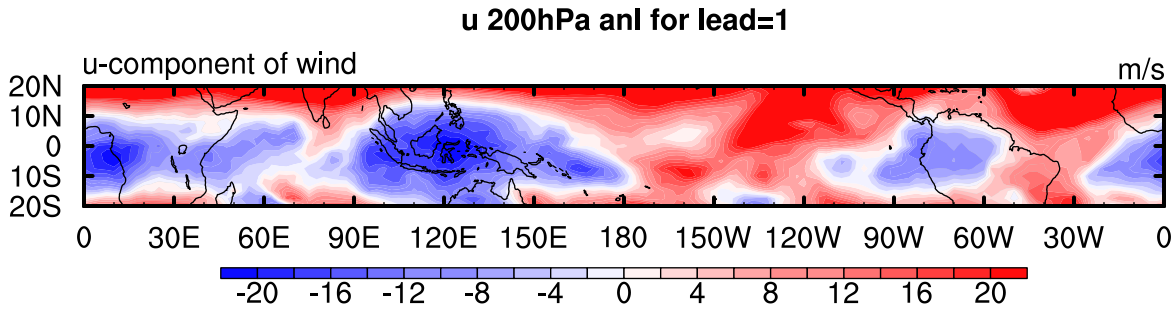
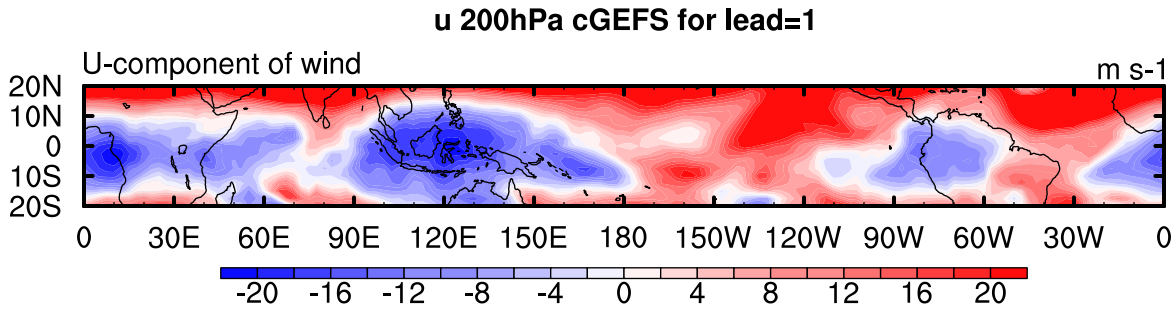
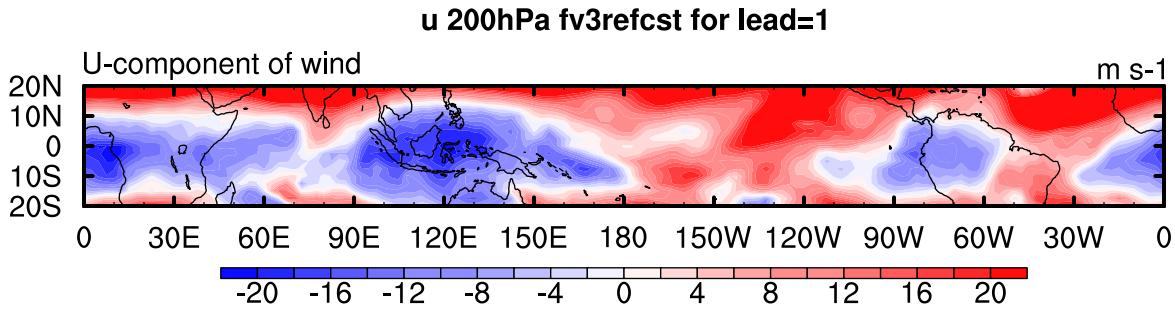
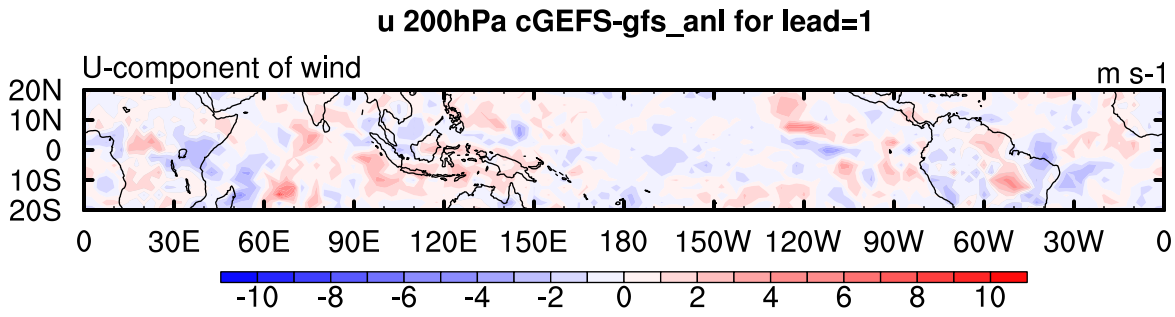
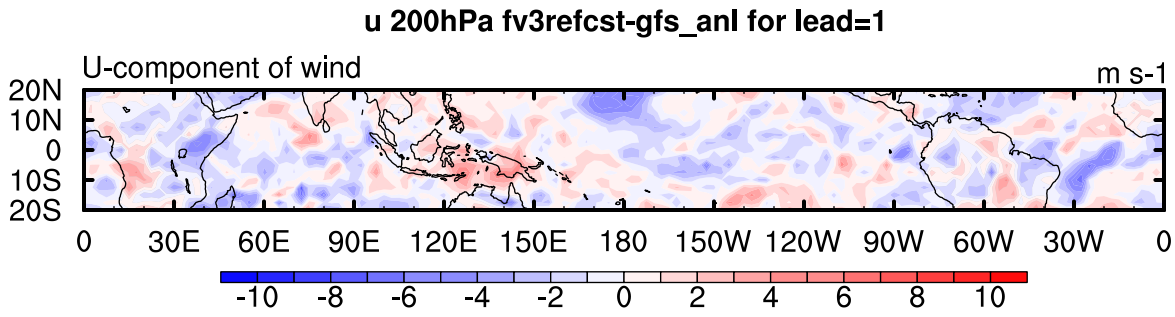
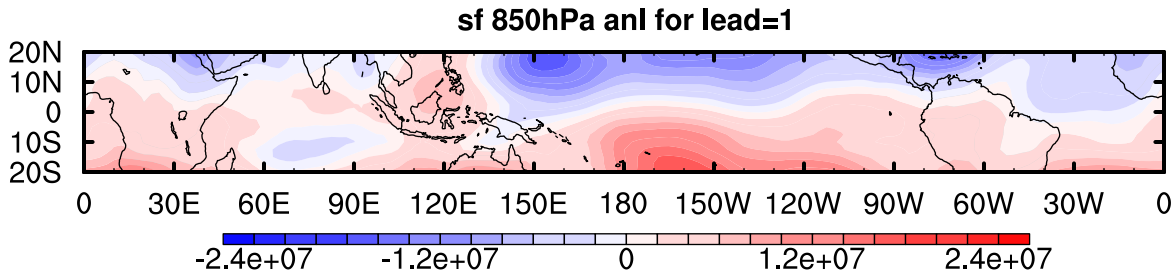

u 200hPa anl for lead=1
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=1
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=1
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=1
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=1
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


sf 850hPa anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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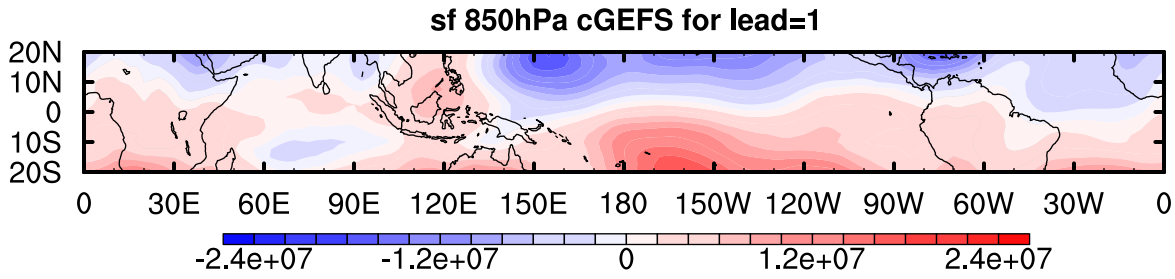
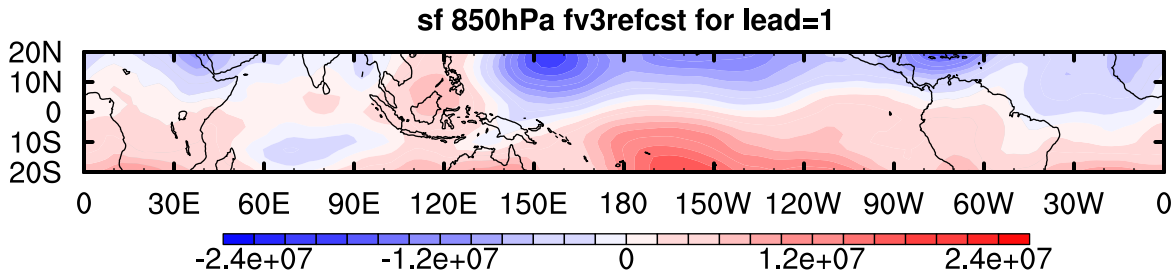
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
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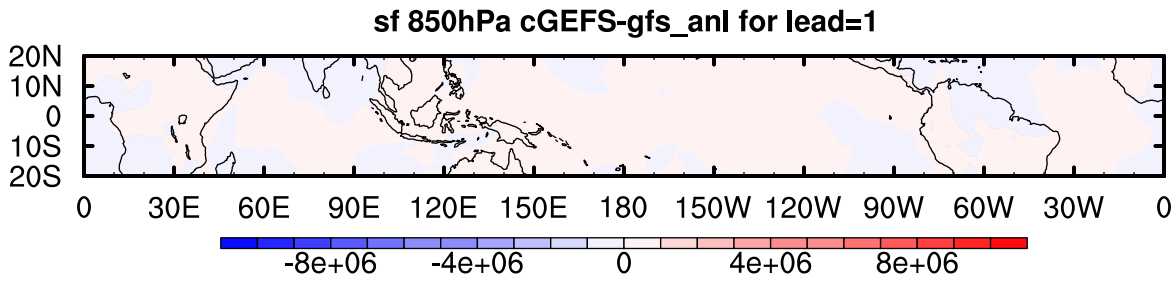
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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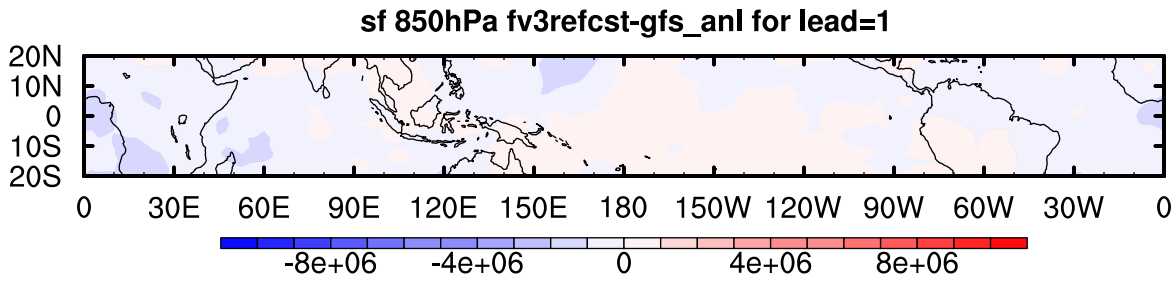
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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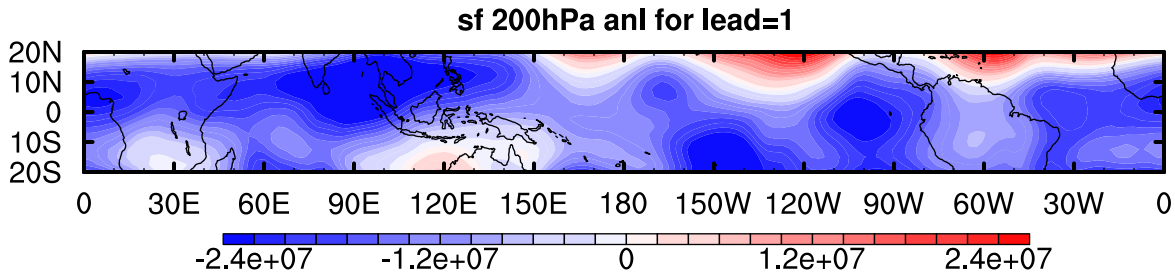
-4e+06
0
4e+06
8e+06


sf 200hPa anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
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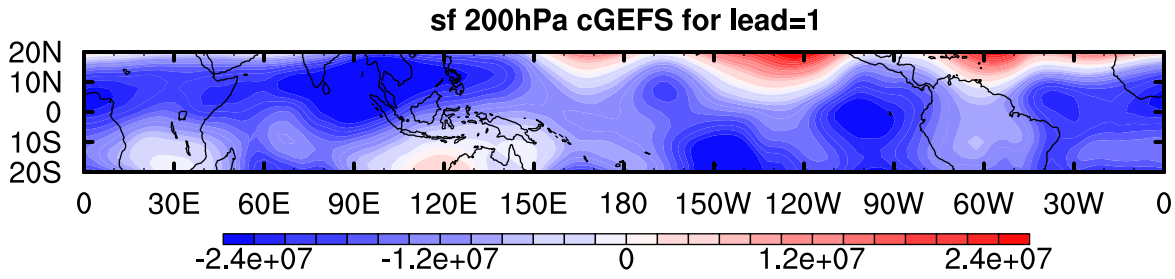
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
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60W
30W
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0
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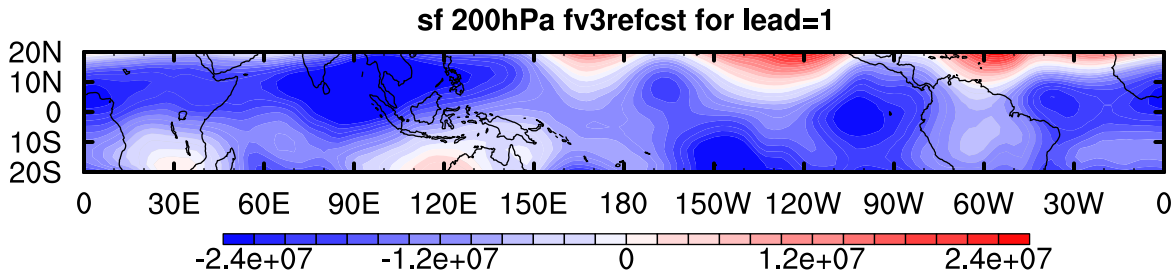
2.4e+07


sf 200hPa fv3refcst for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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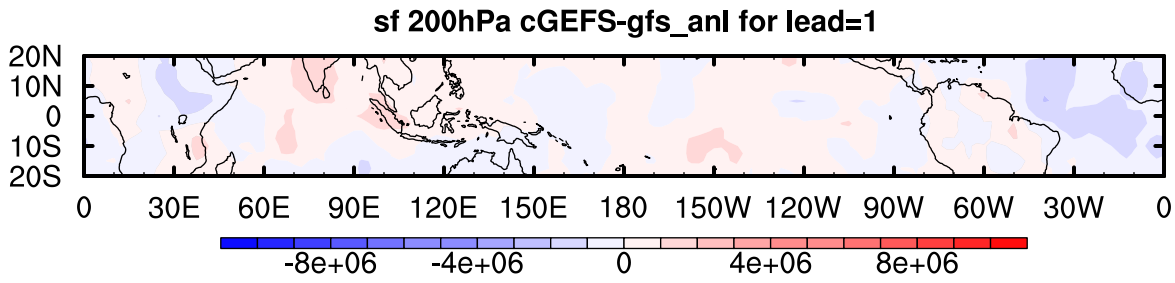
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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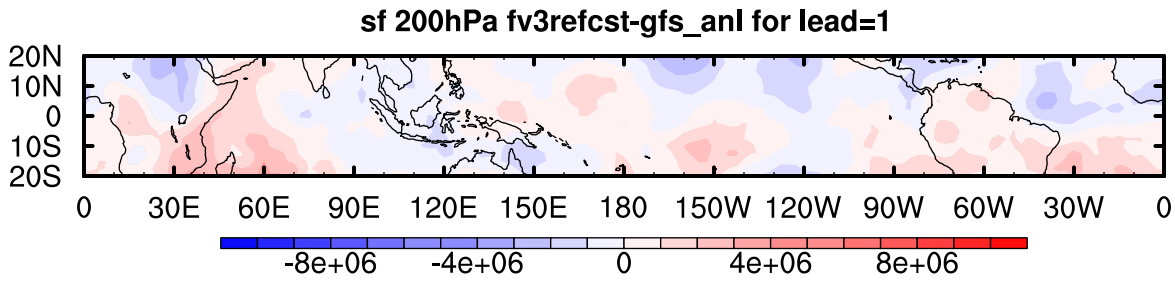
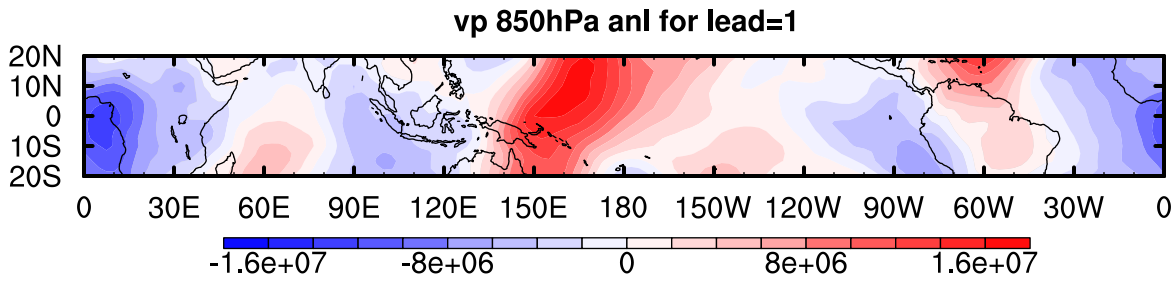
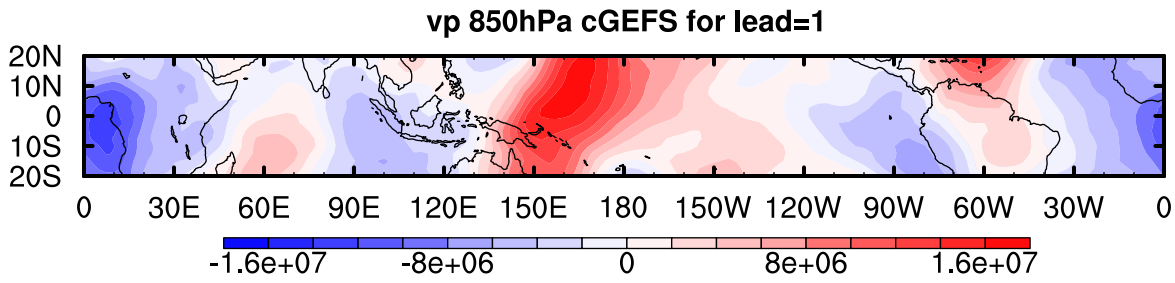
-4e+06
0
4e+06
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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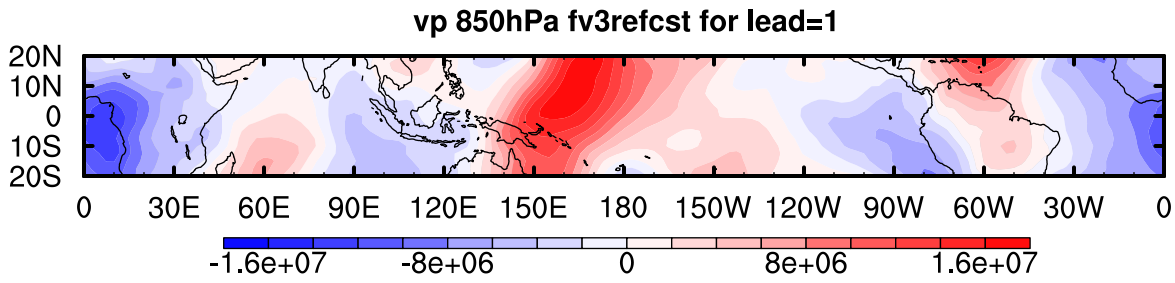
1.6e+07


vp 850hPa fv3refcst for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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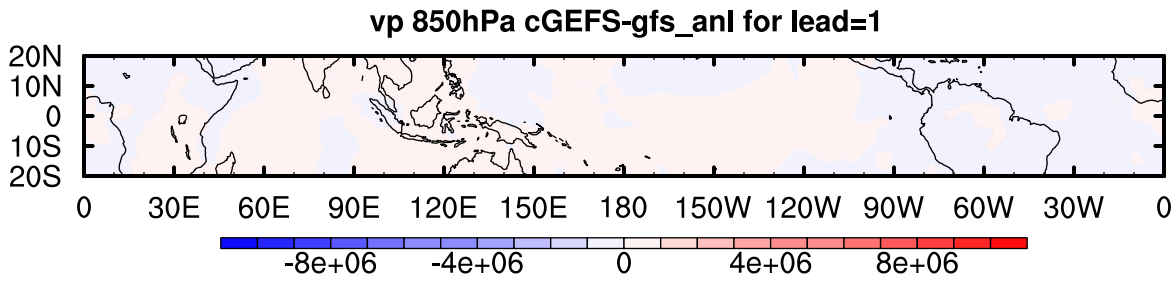
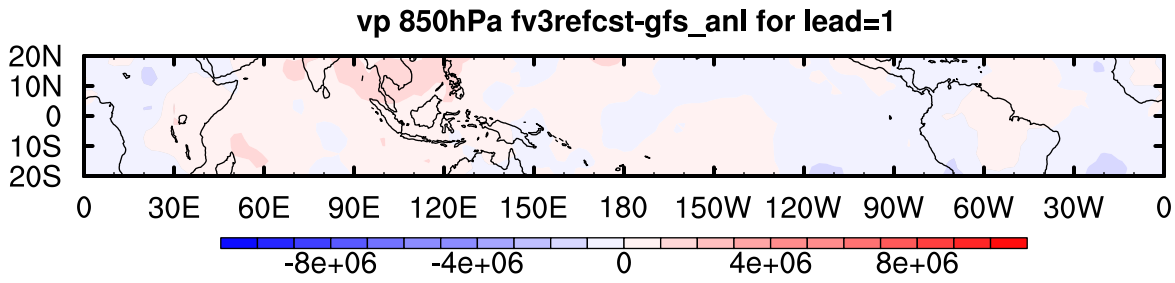
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
0
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-4e+06
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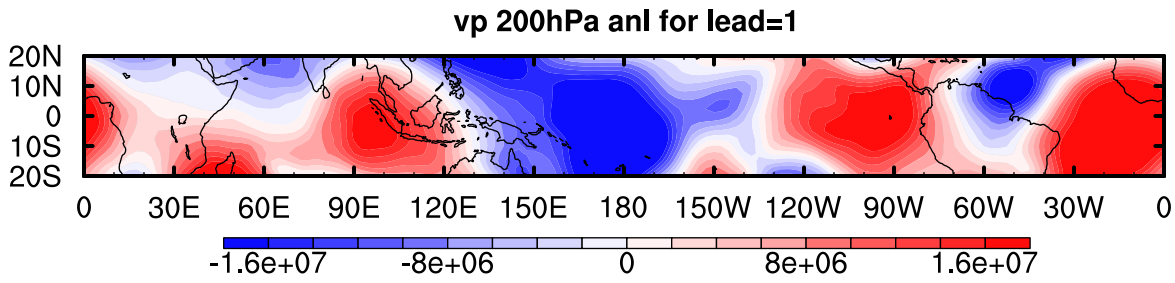
8e+06


vp 200hPa anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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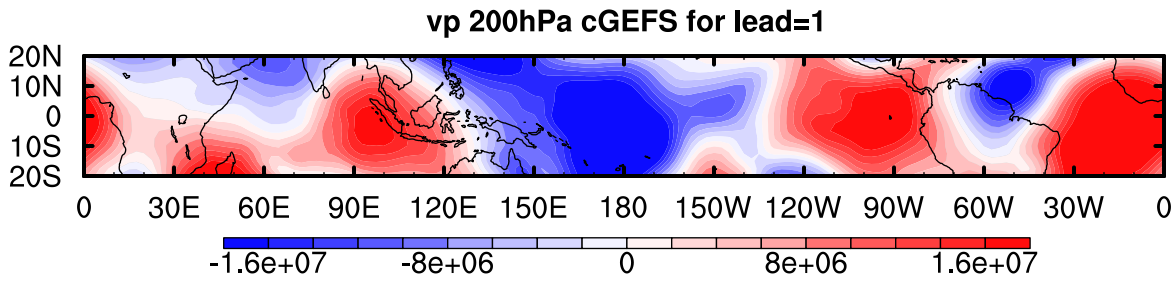
1.6e+07


vp 200hPa cGEFS for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
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60W
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0
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-8e+06
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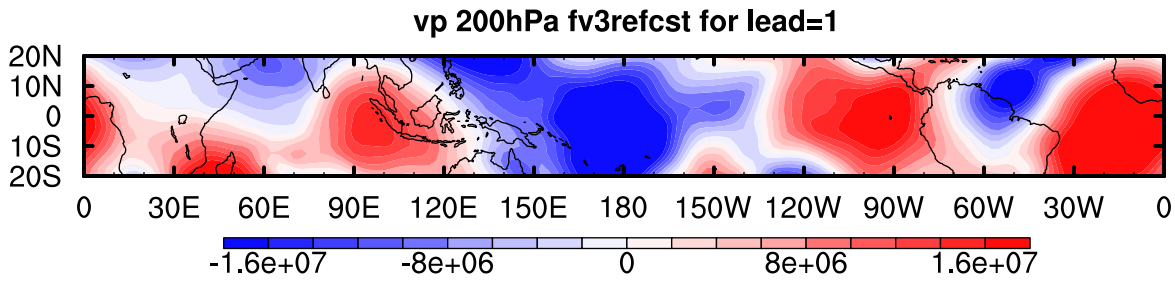
1.6e+07


vp 200hPa fv3refcst for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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150W
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90W
60W
30W
0
-1.6e+07
-8e+06
0
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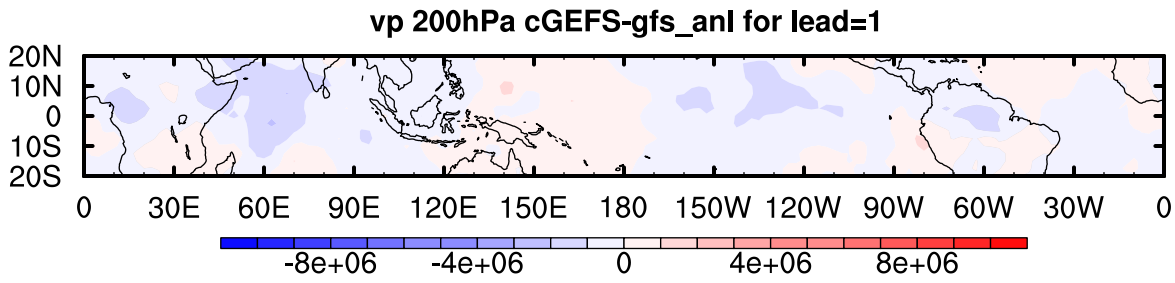
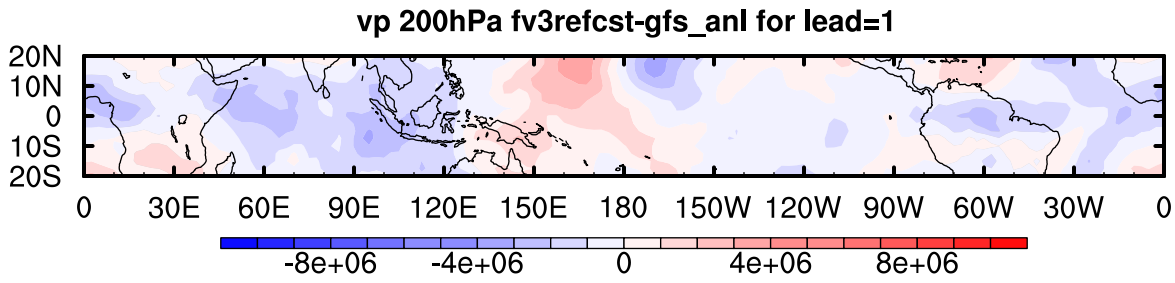
1.6e+07


vp 200hPa cGEFS-gfs_anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 200hPa fv3refcst-gfs_anl for lead=1
20N
10N
0
10S
20S
0
30E
60E
90E
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150E
180
150W
120W
90W
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30W
0
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-4e+06
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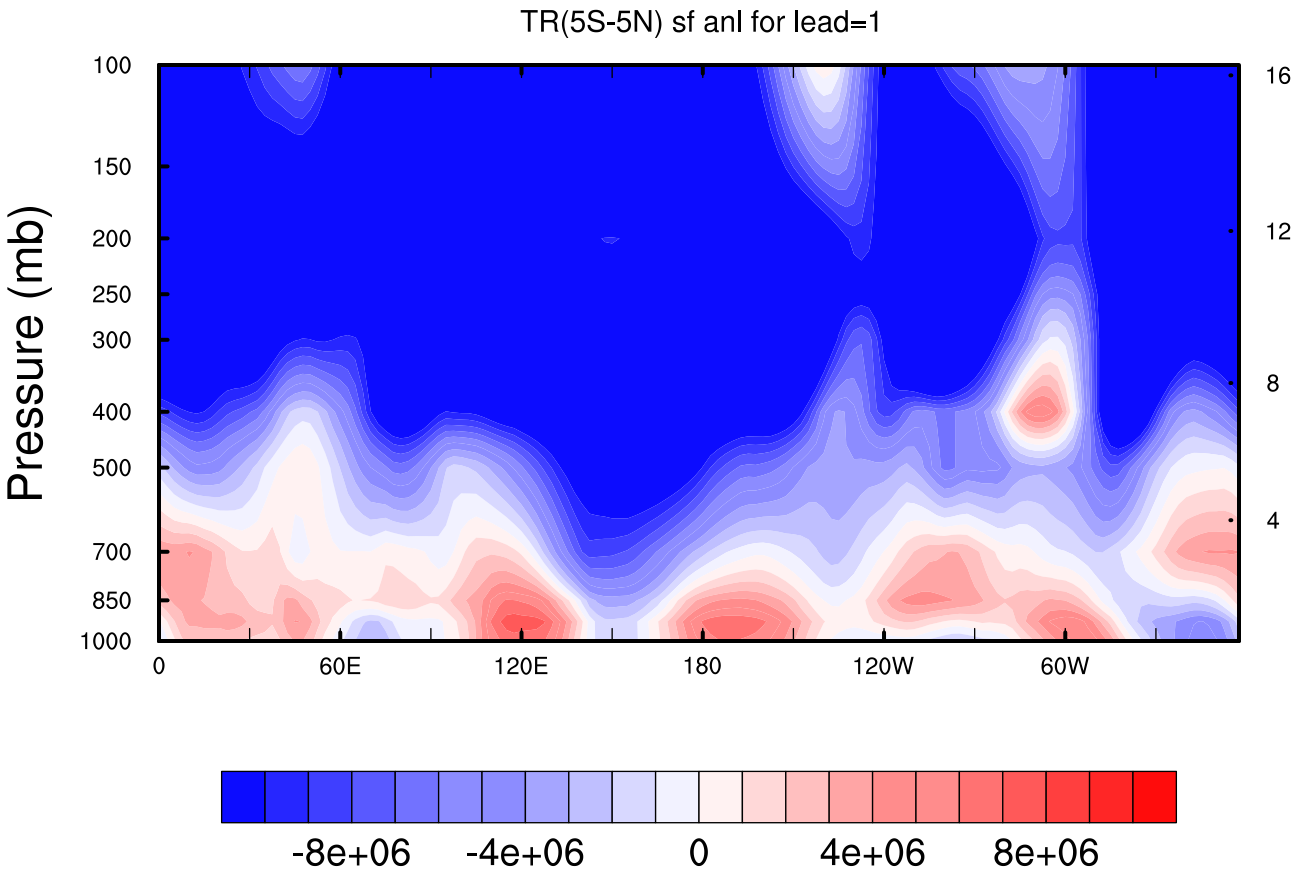
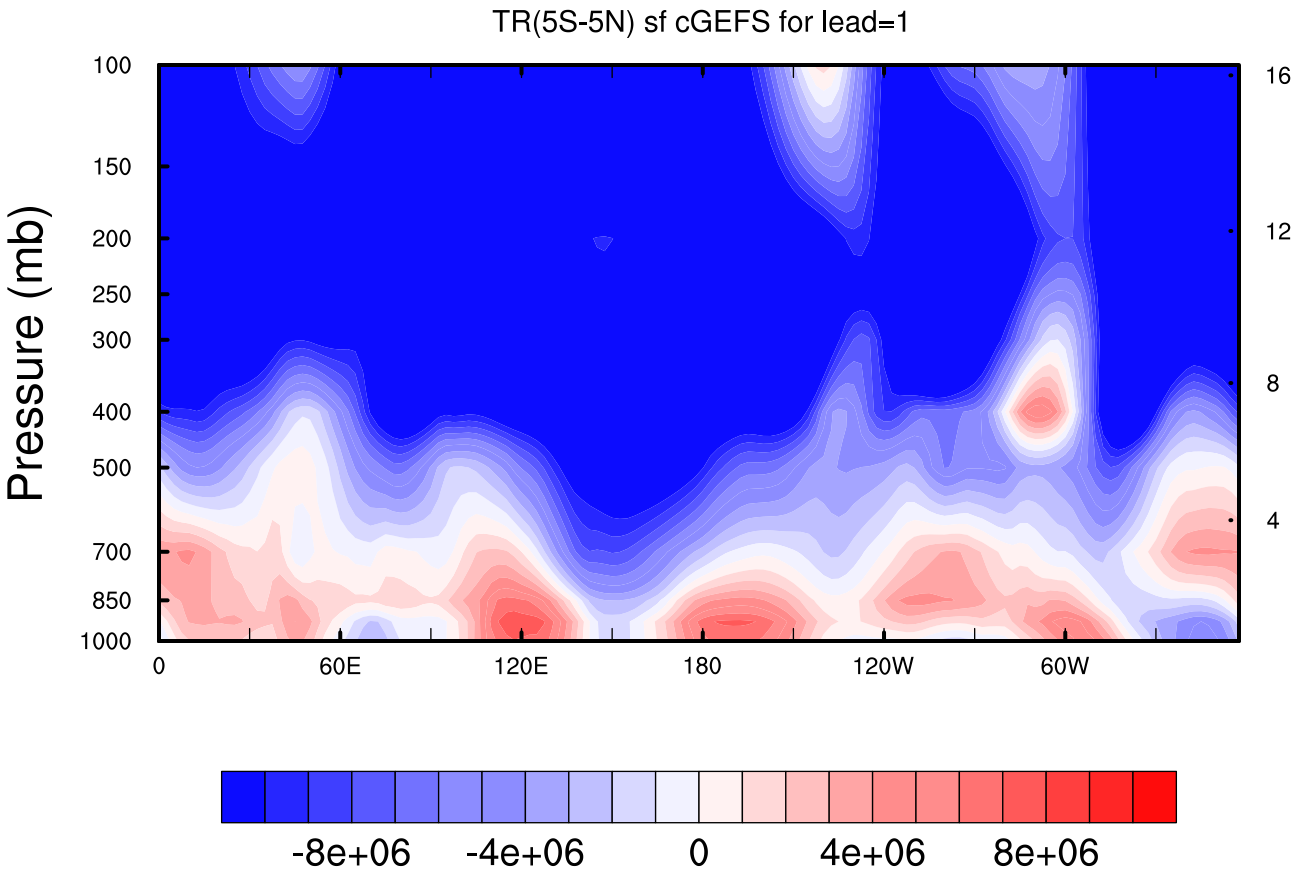
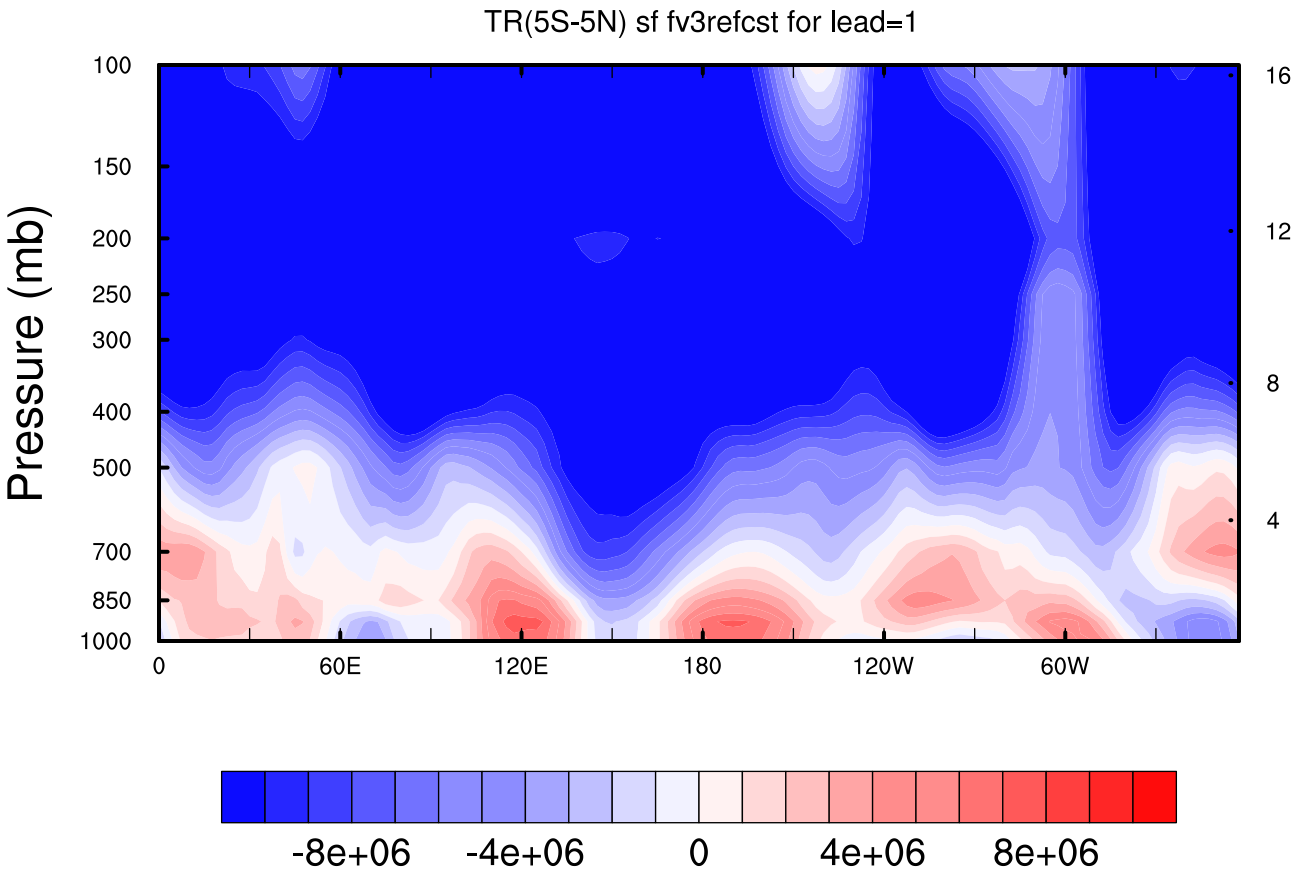
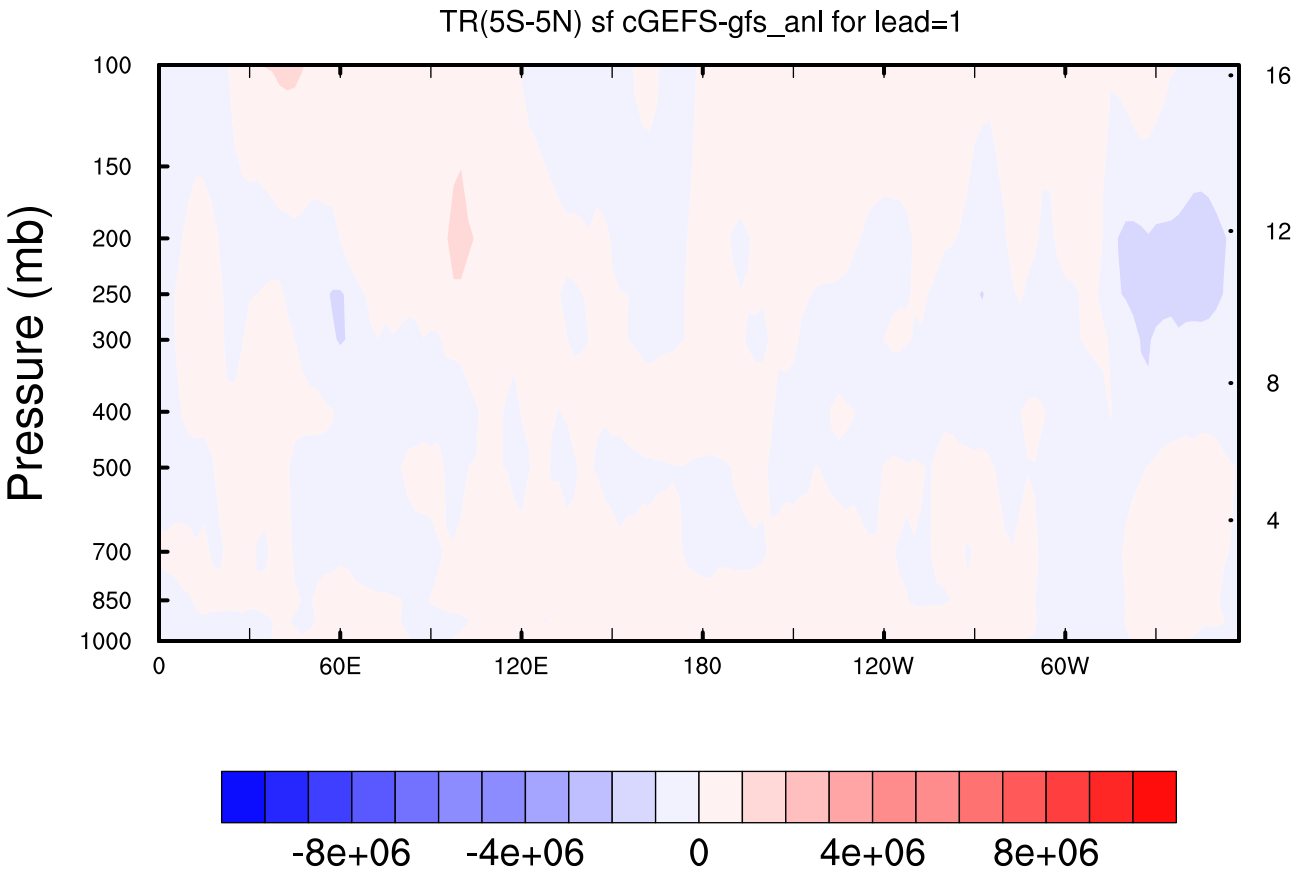
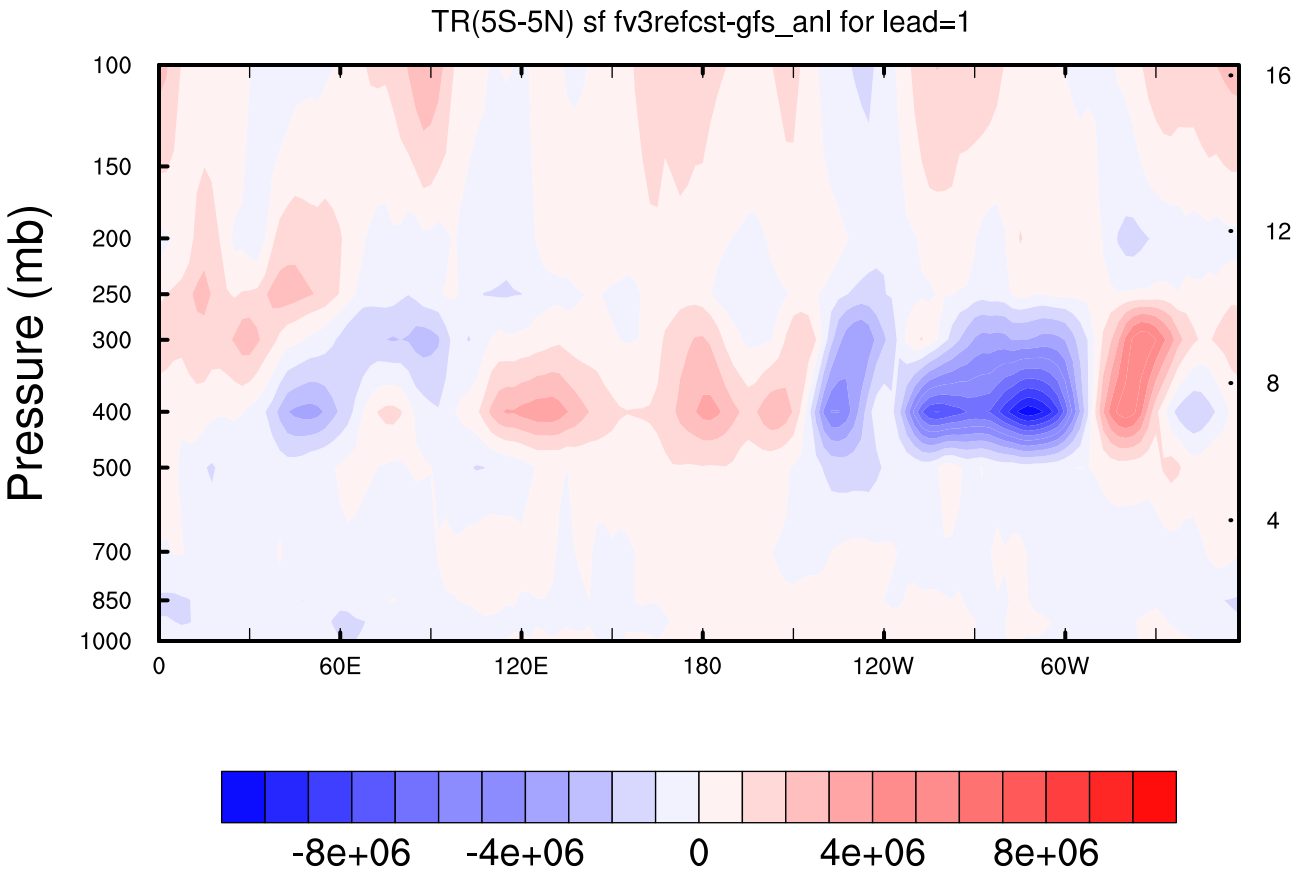
8e+06

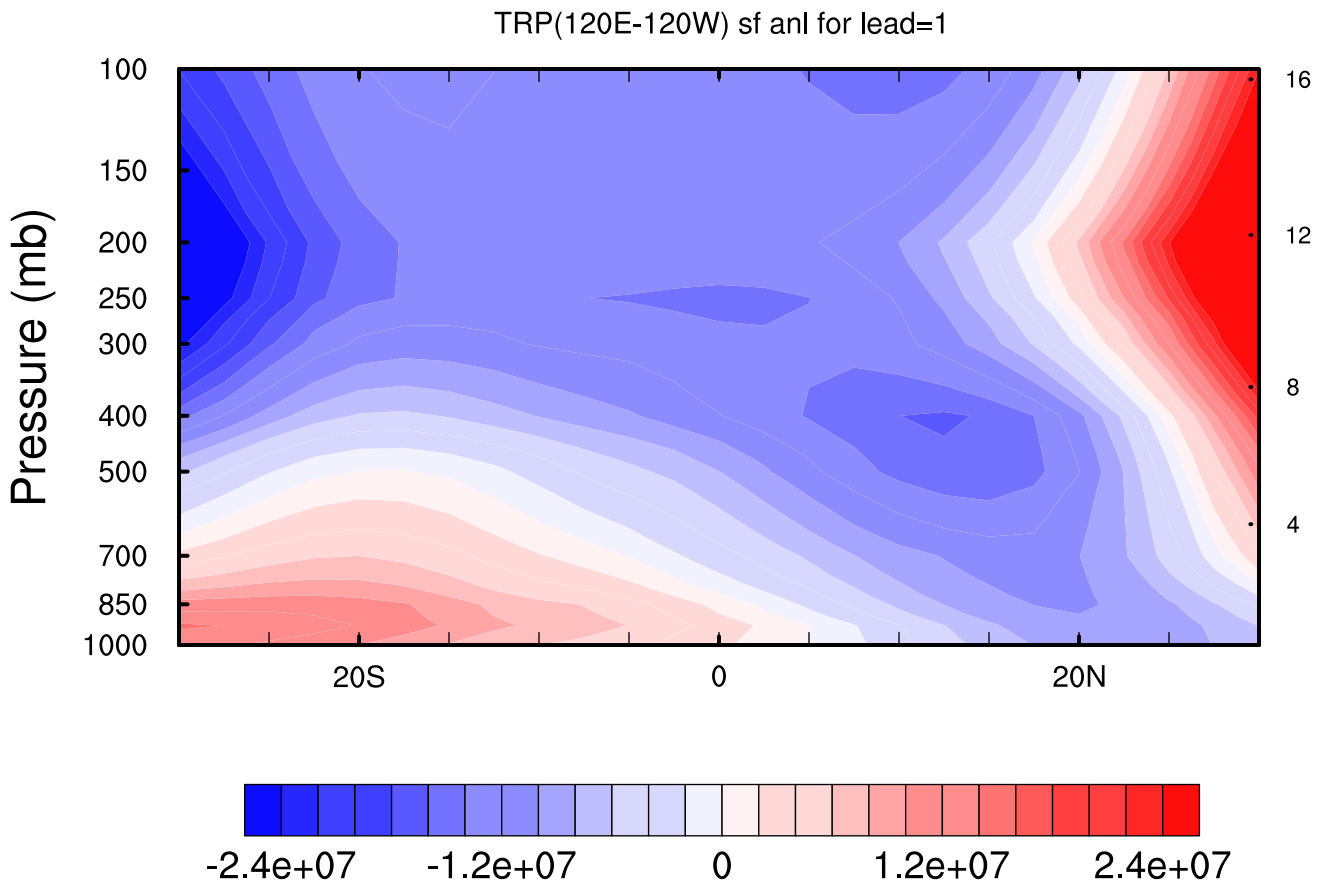

TR(5S-5N) sf anl for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

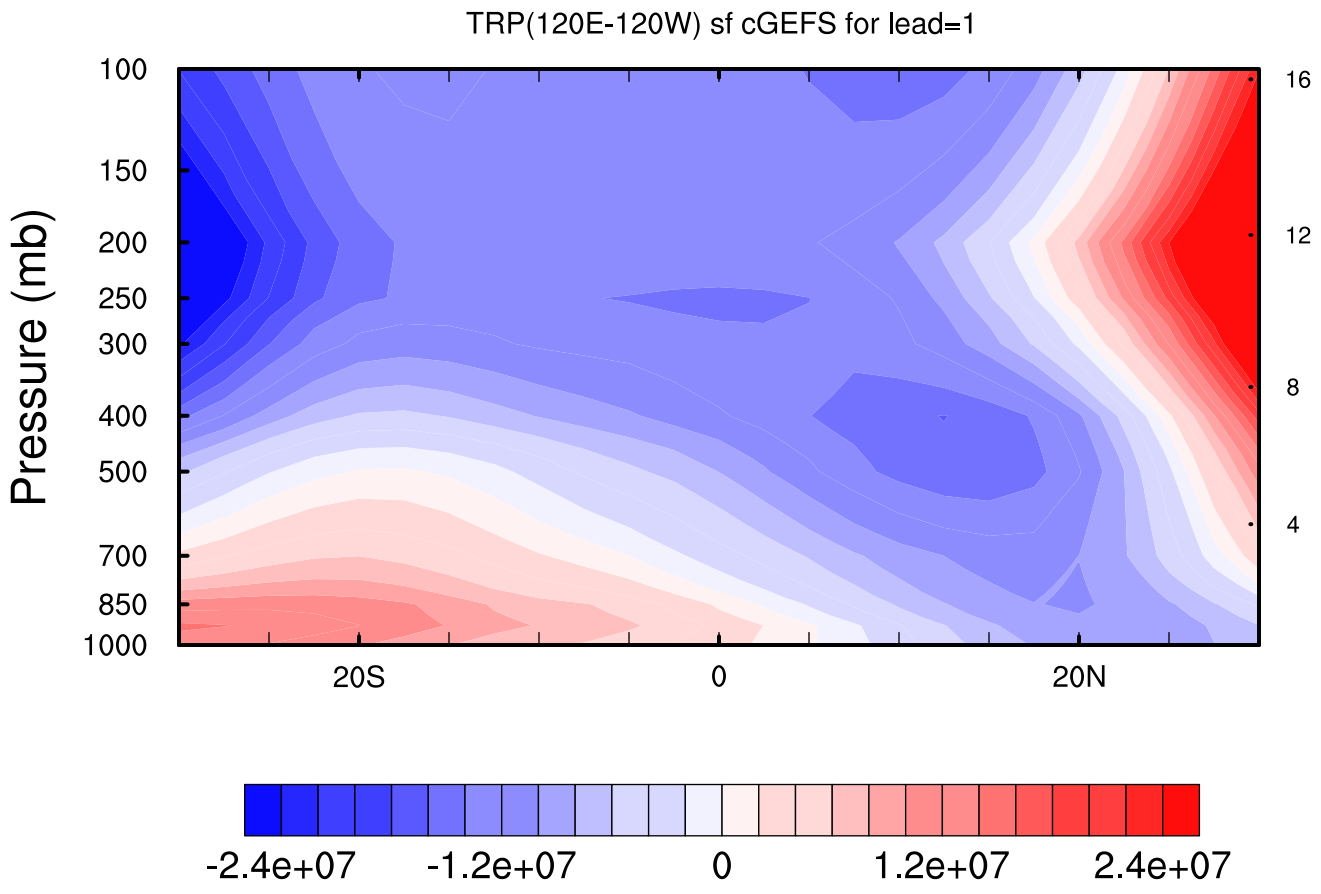

TR(5S-5N) sf cGEFS for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

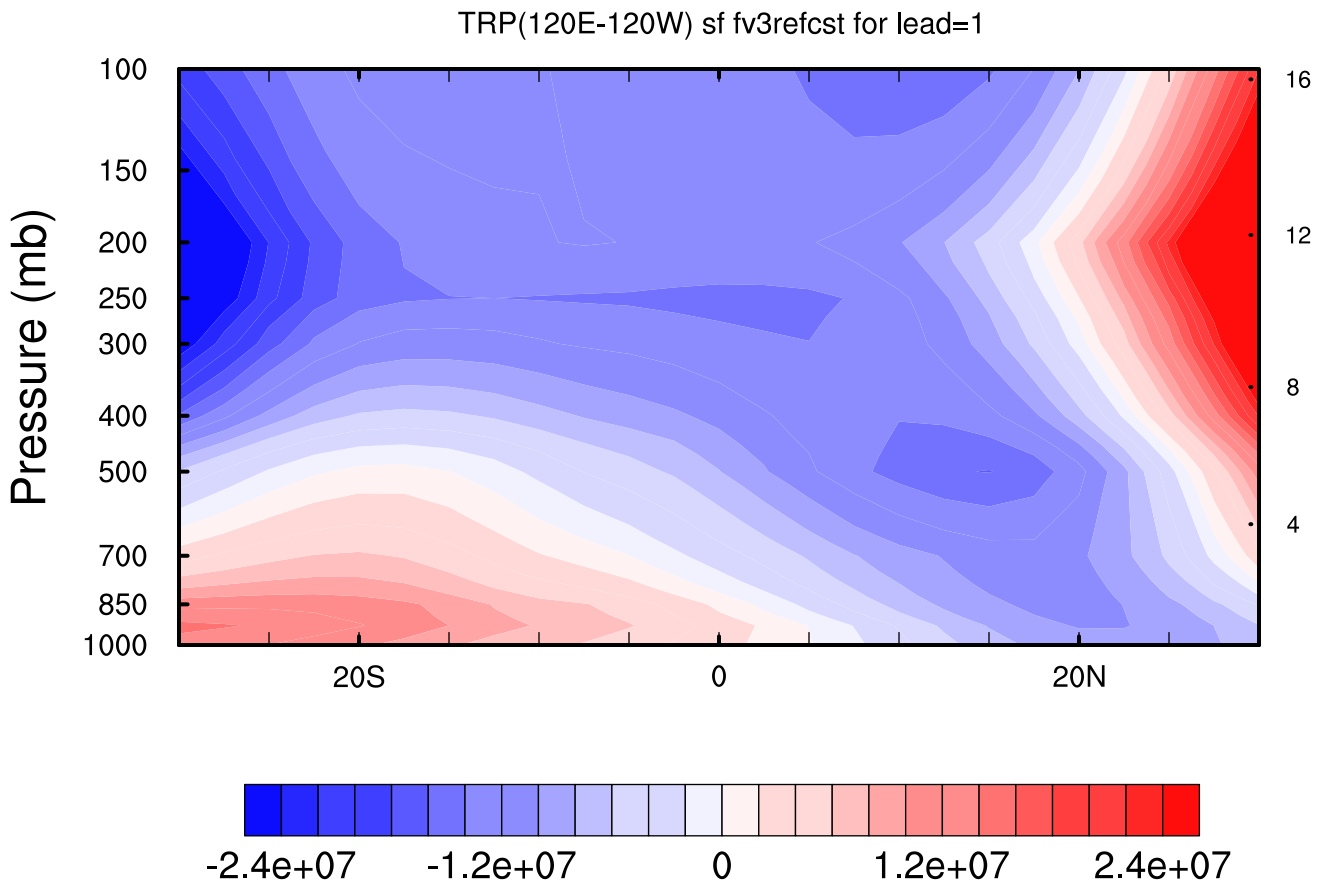

TR(5S-5N) sf fv3refcst for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

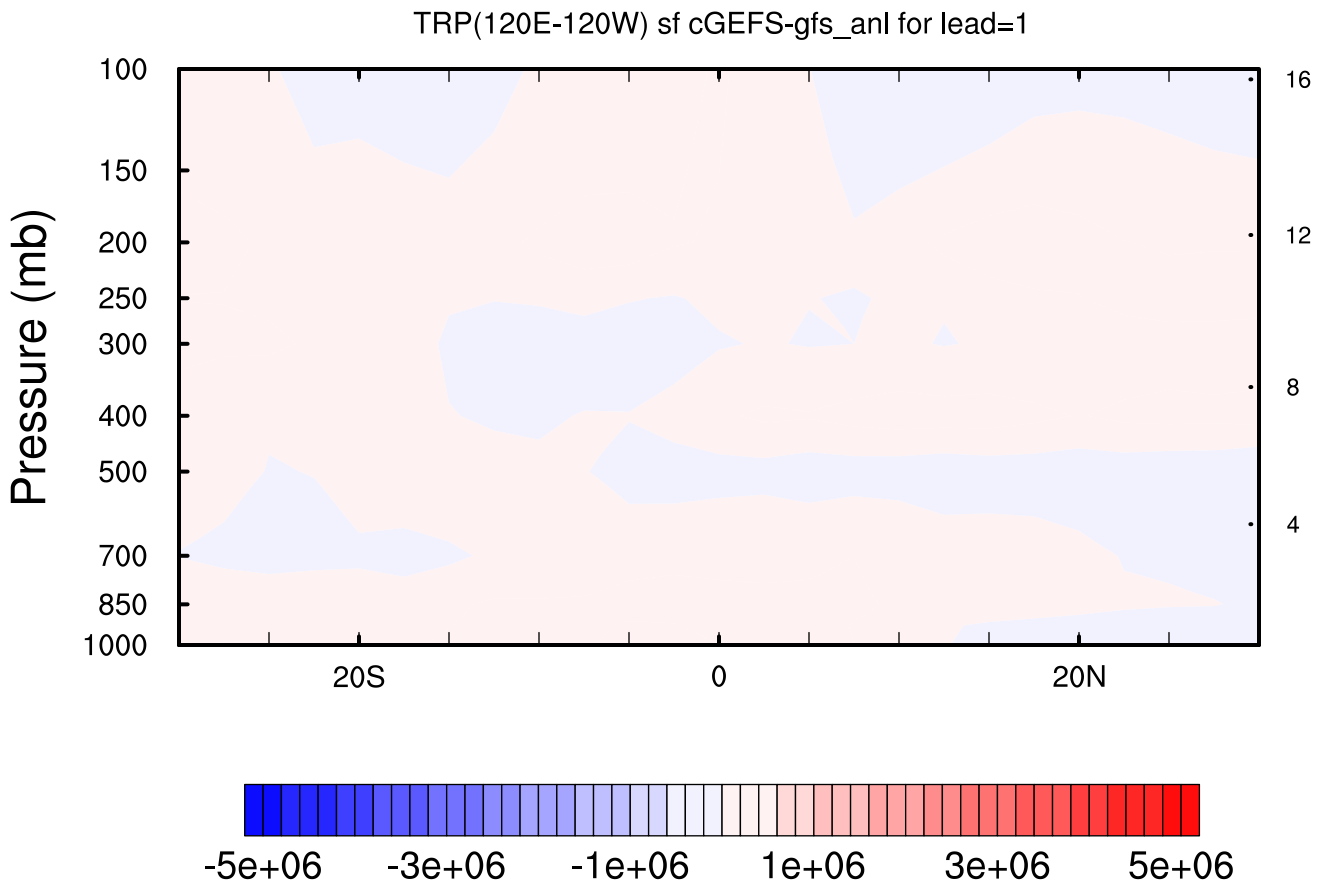

TR(5S-5N) sf cGEFS-gfs_anl for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

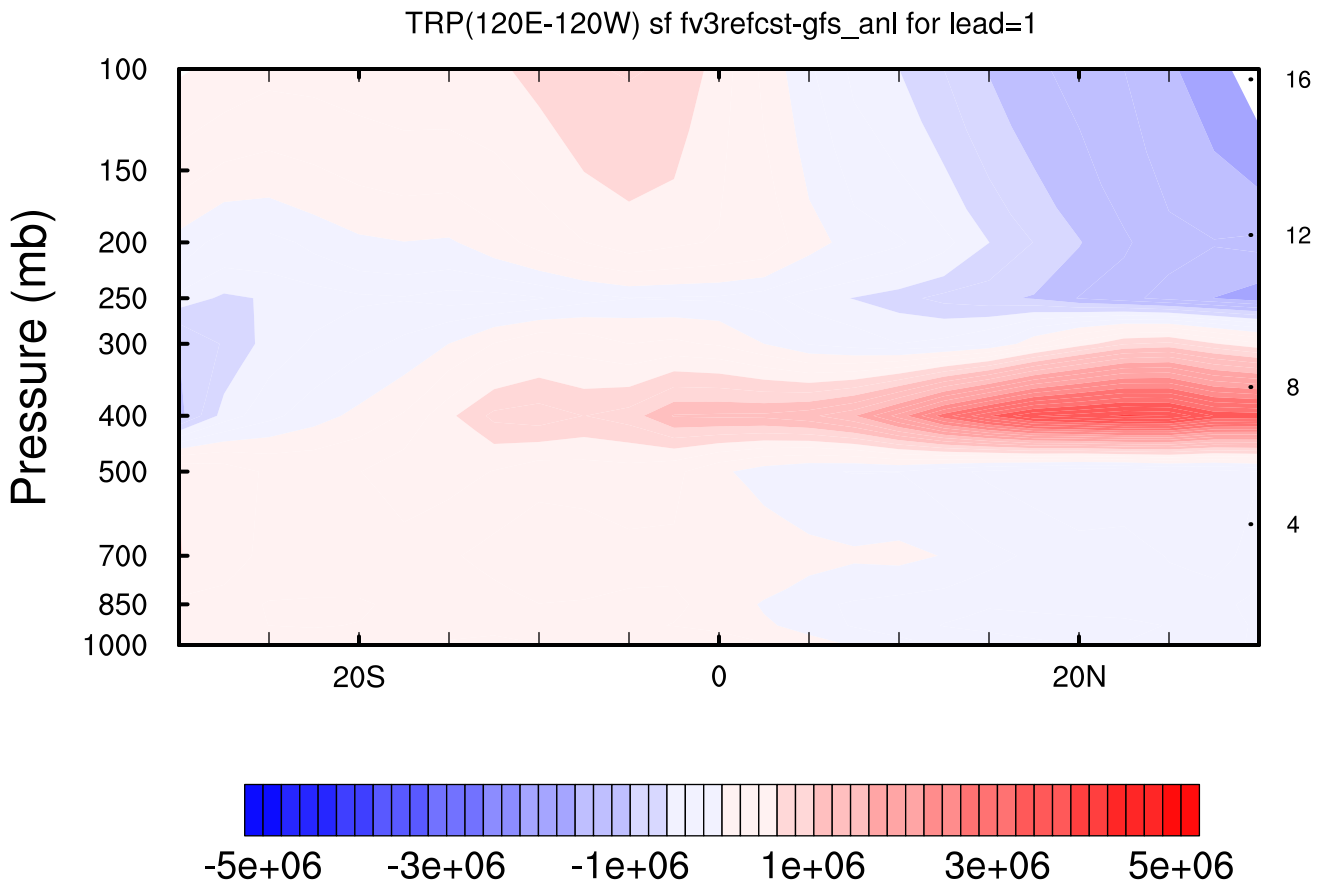

TR(5S-5N) sf fv3refcst-gfs_anl for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

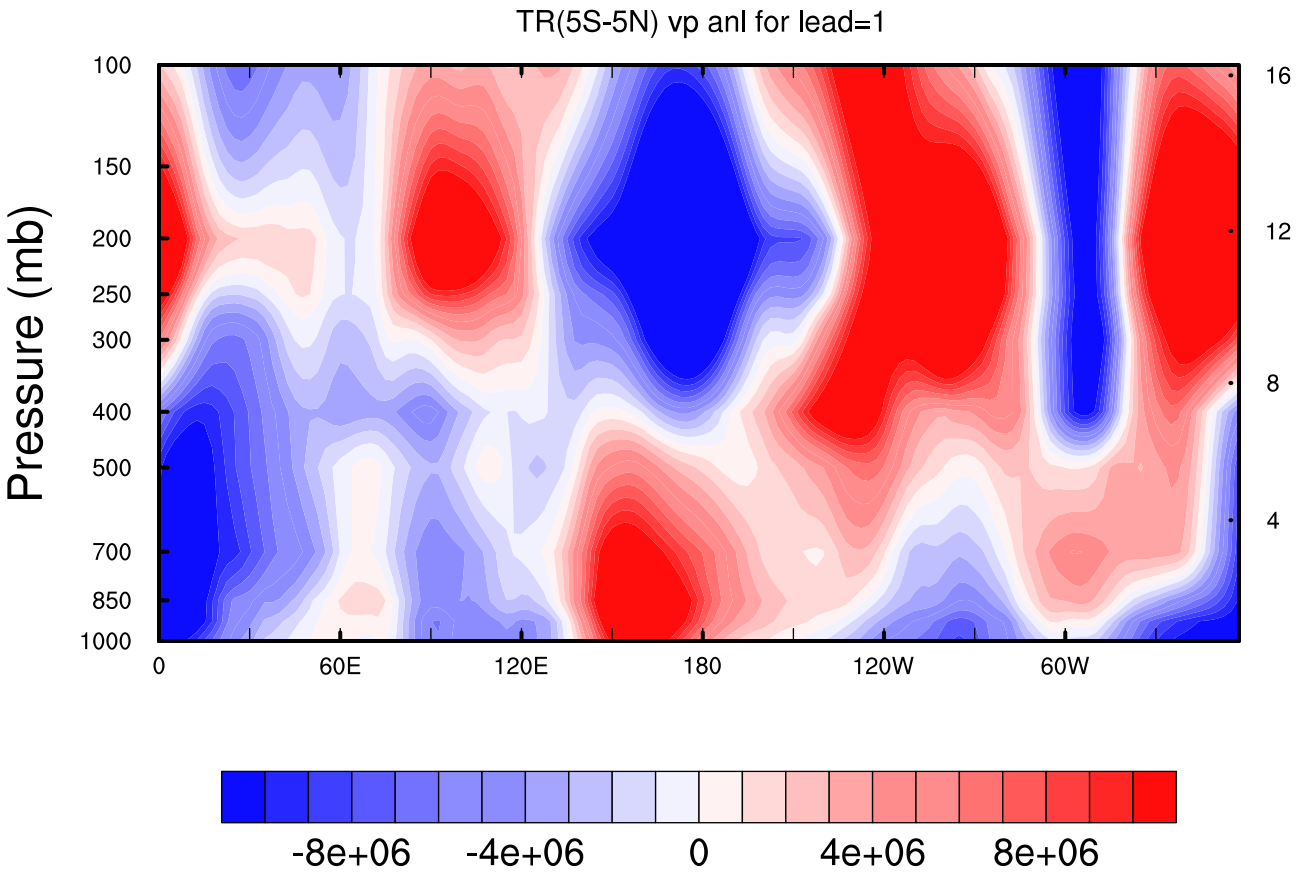

TRP(120E-120W) sf anl for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

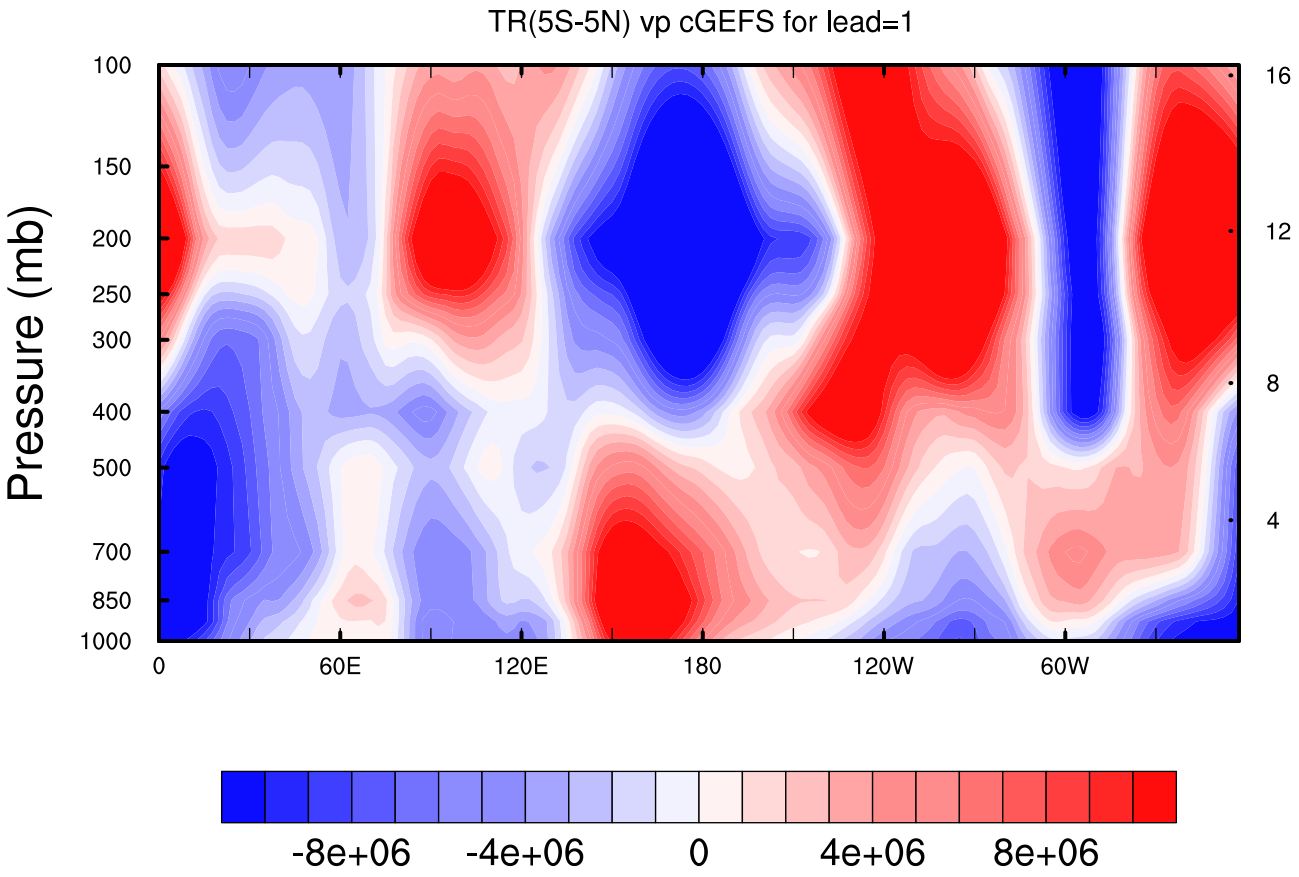

TRP(120E-120W) sf cGEFS for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

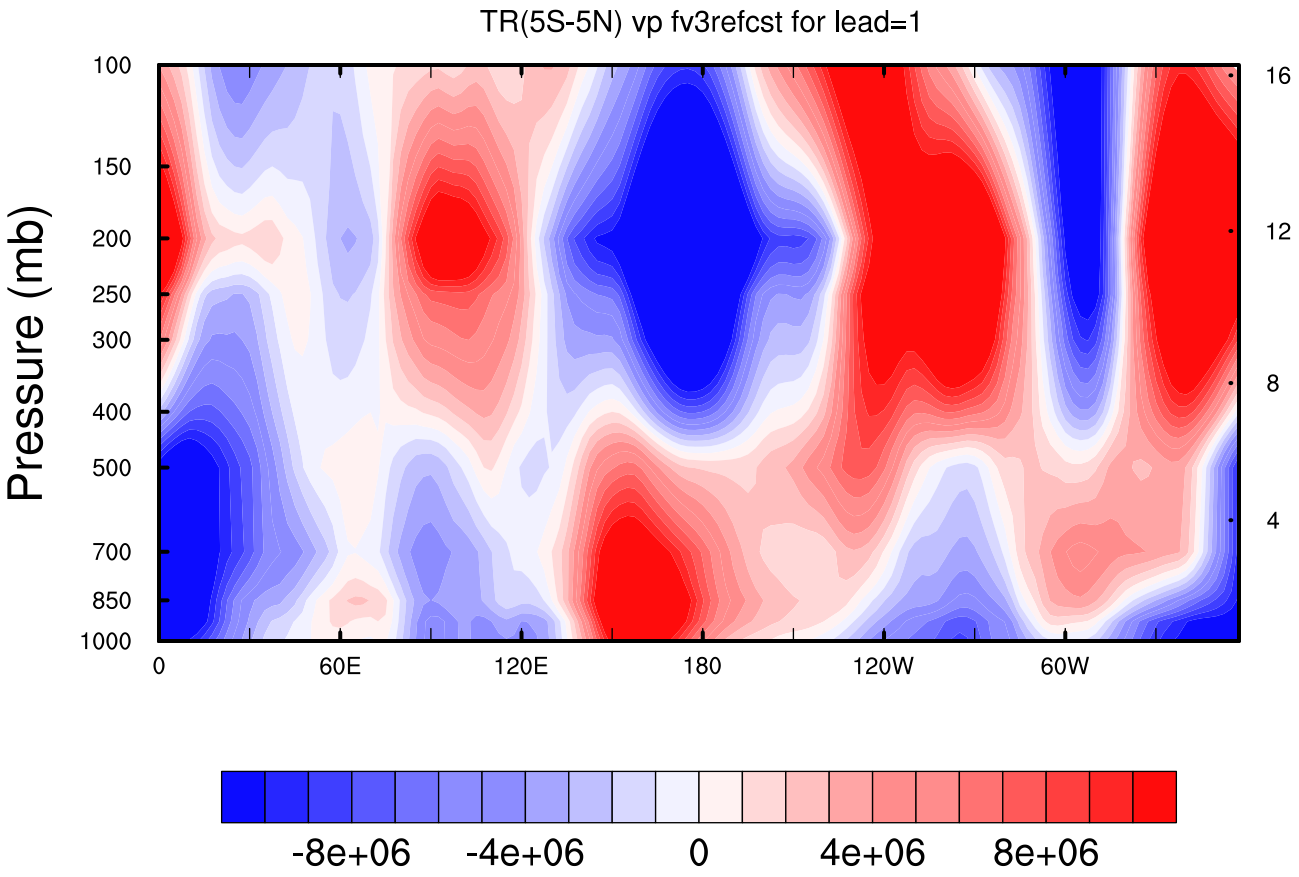

TRP(120E-120W) sf fv3refcst for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

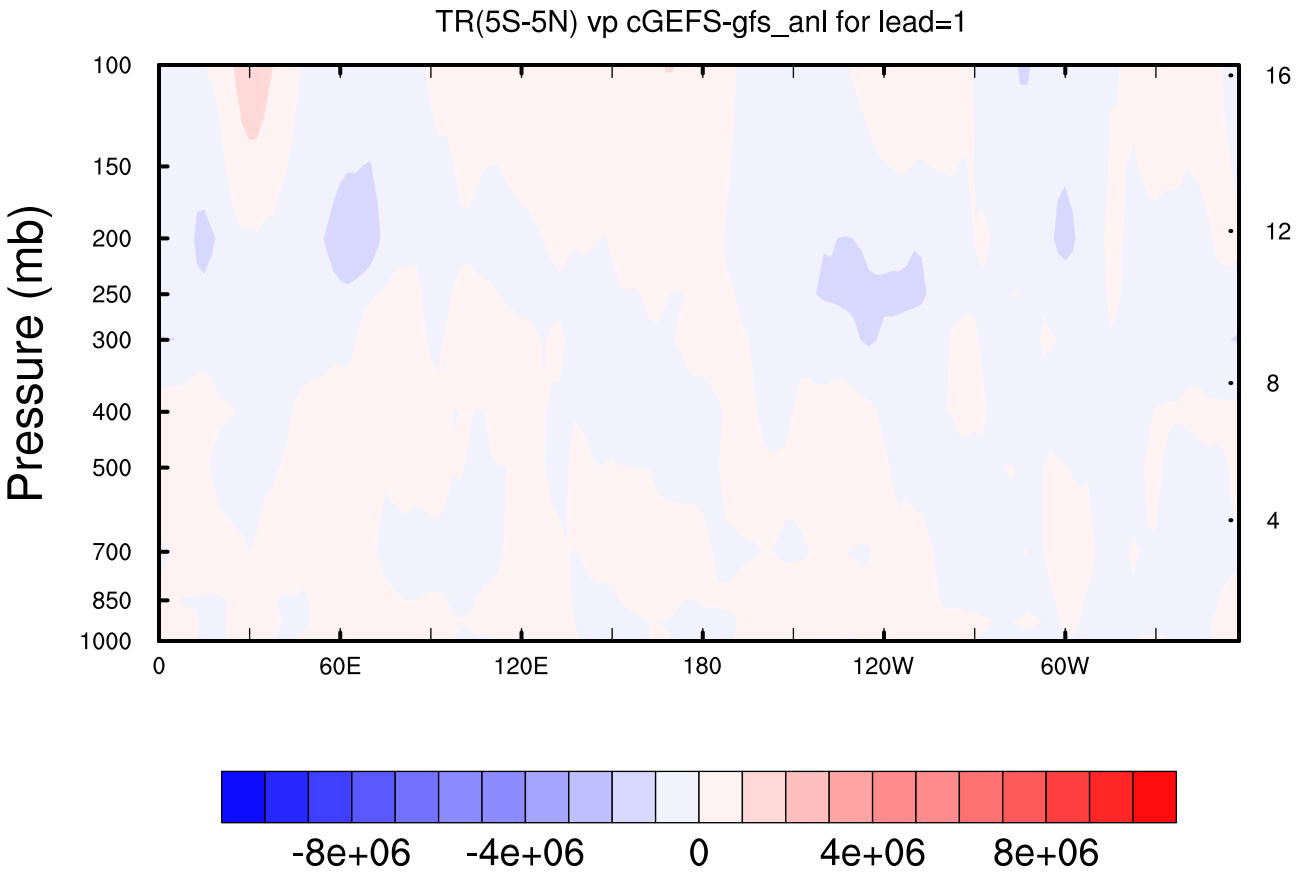

TRP(120E-120W) sf cGEFS-gfs_anl for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

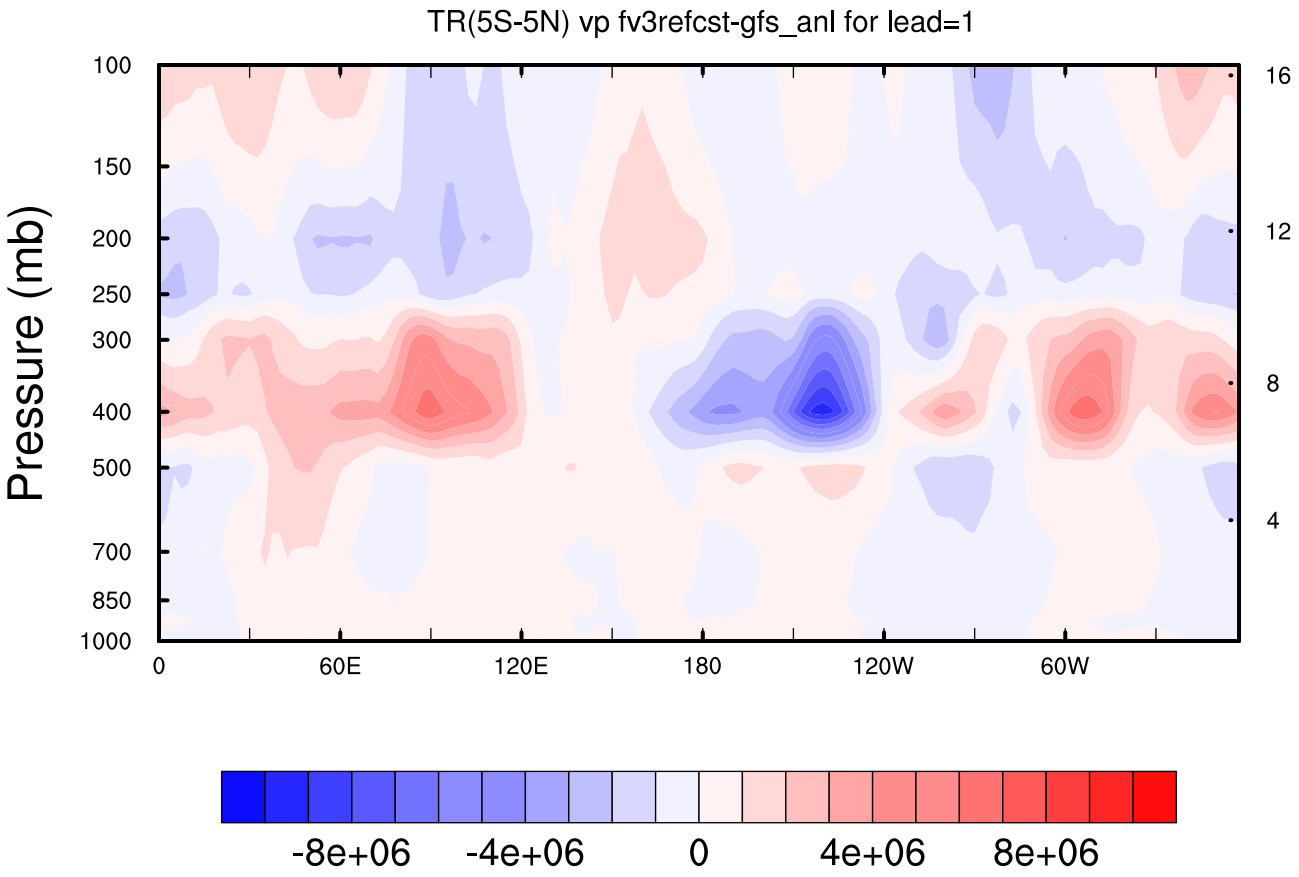

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

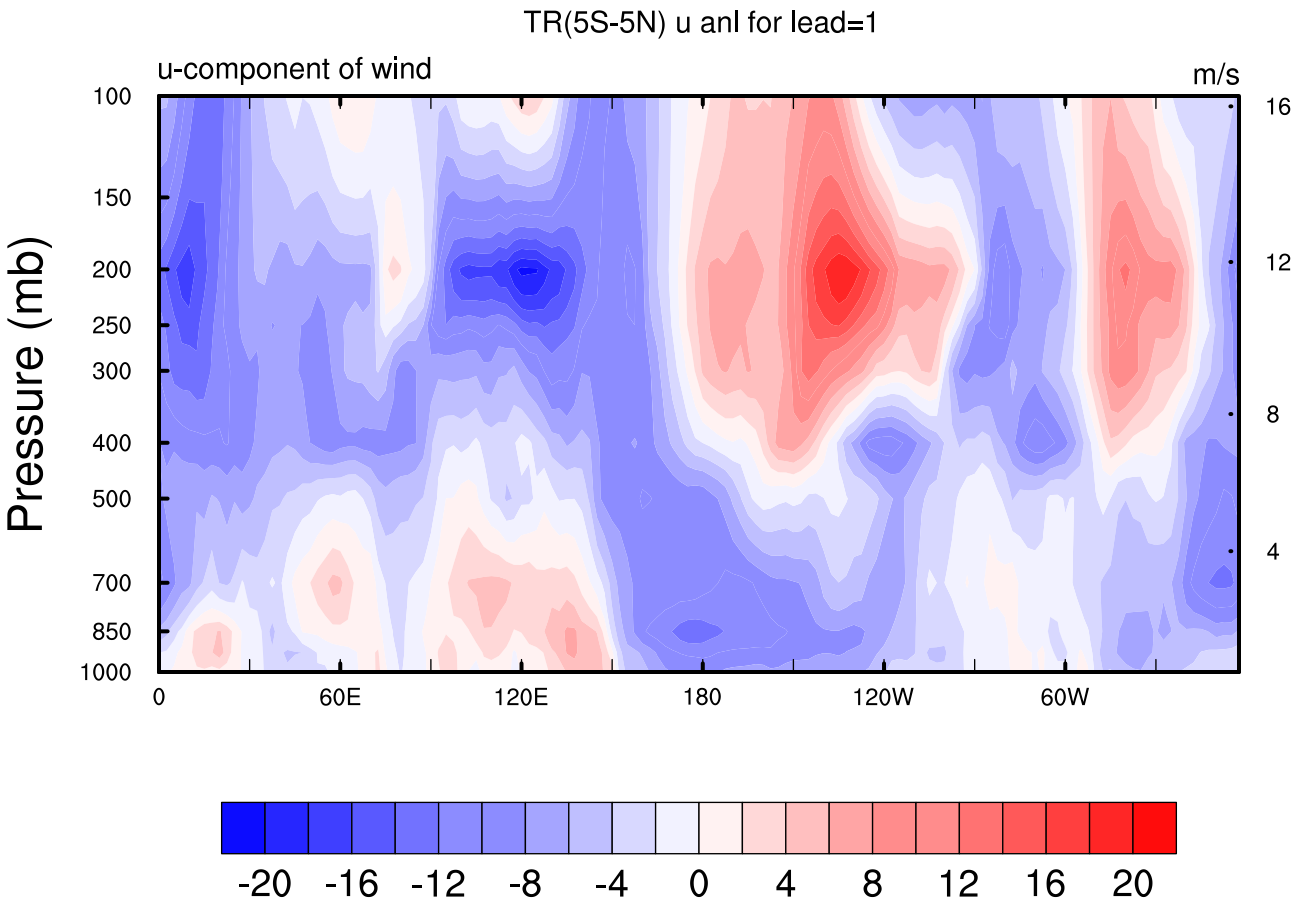

TR(5S-5N) vp anl for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

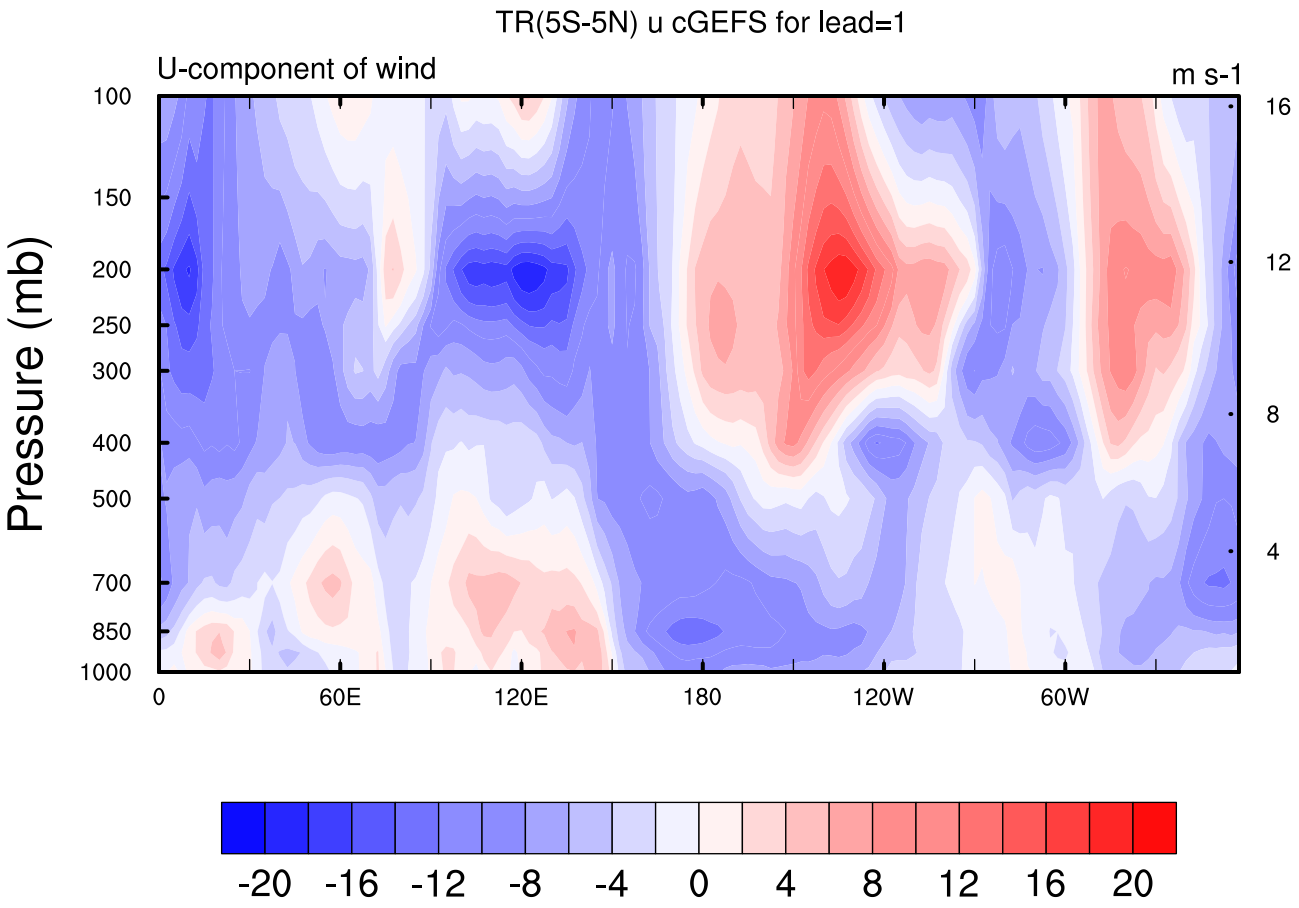

TR(5S-5N) vp cGEFS for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

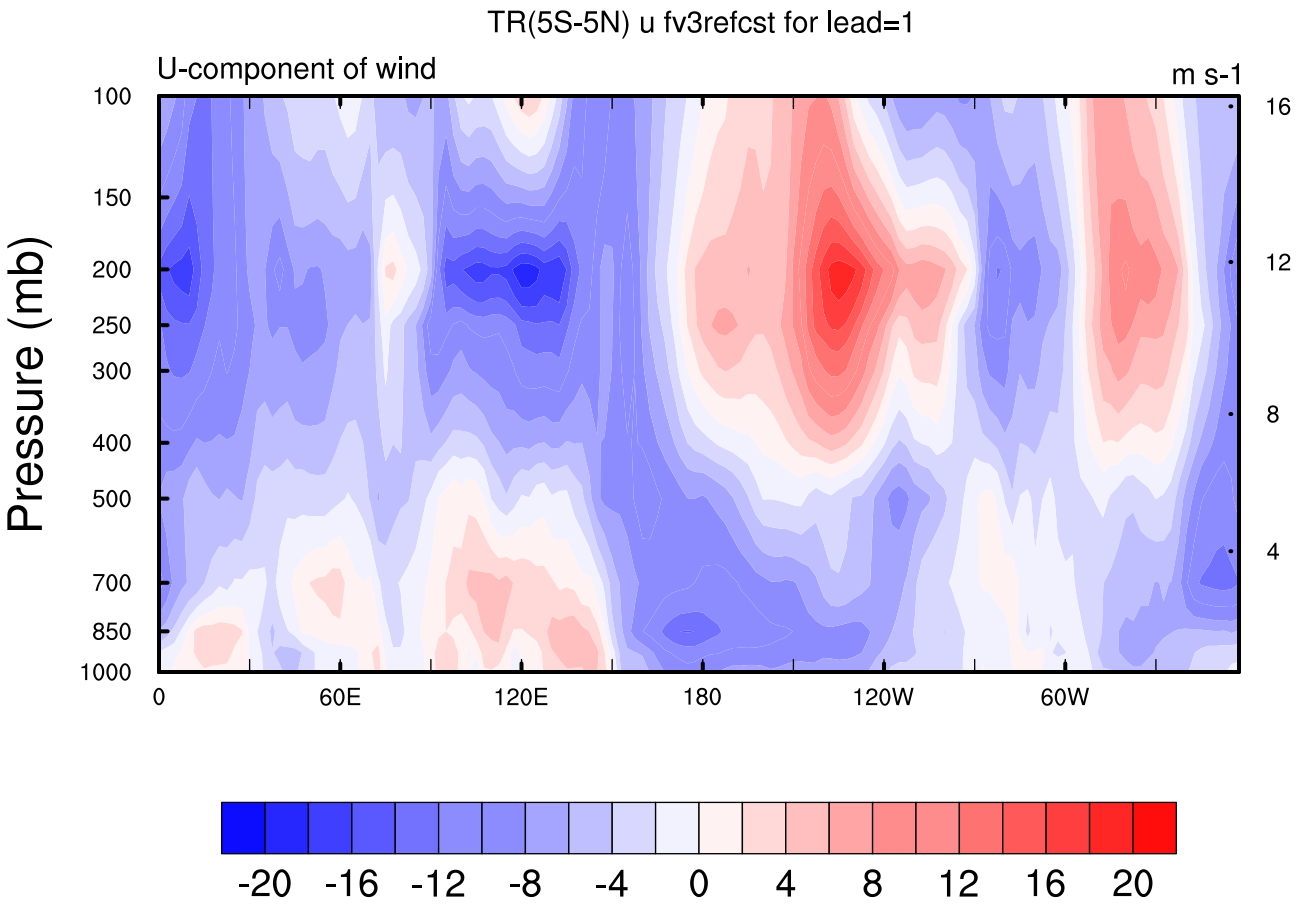

TR(5S-5N) vp fv3refcst for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

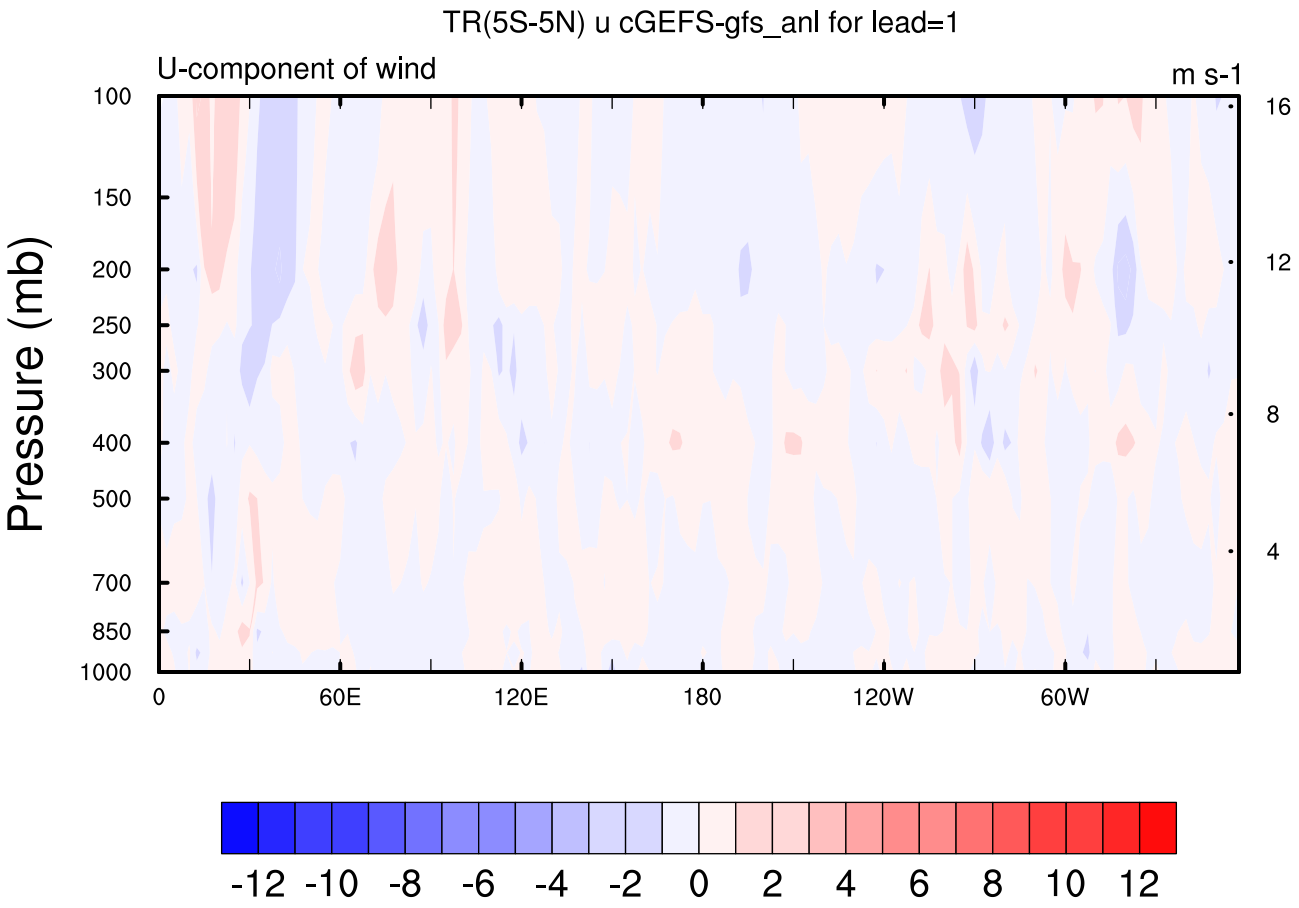

TR(5S-5N) vp cGEFS-gfs_anl for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

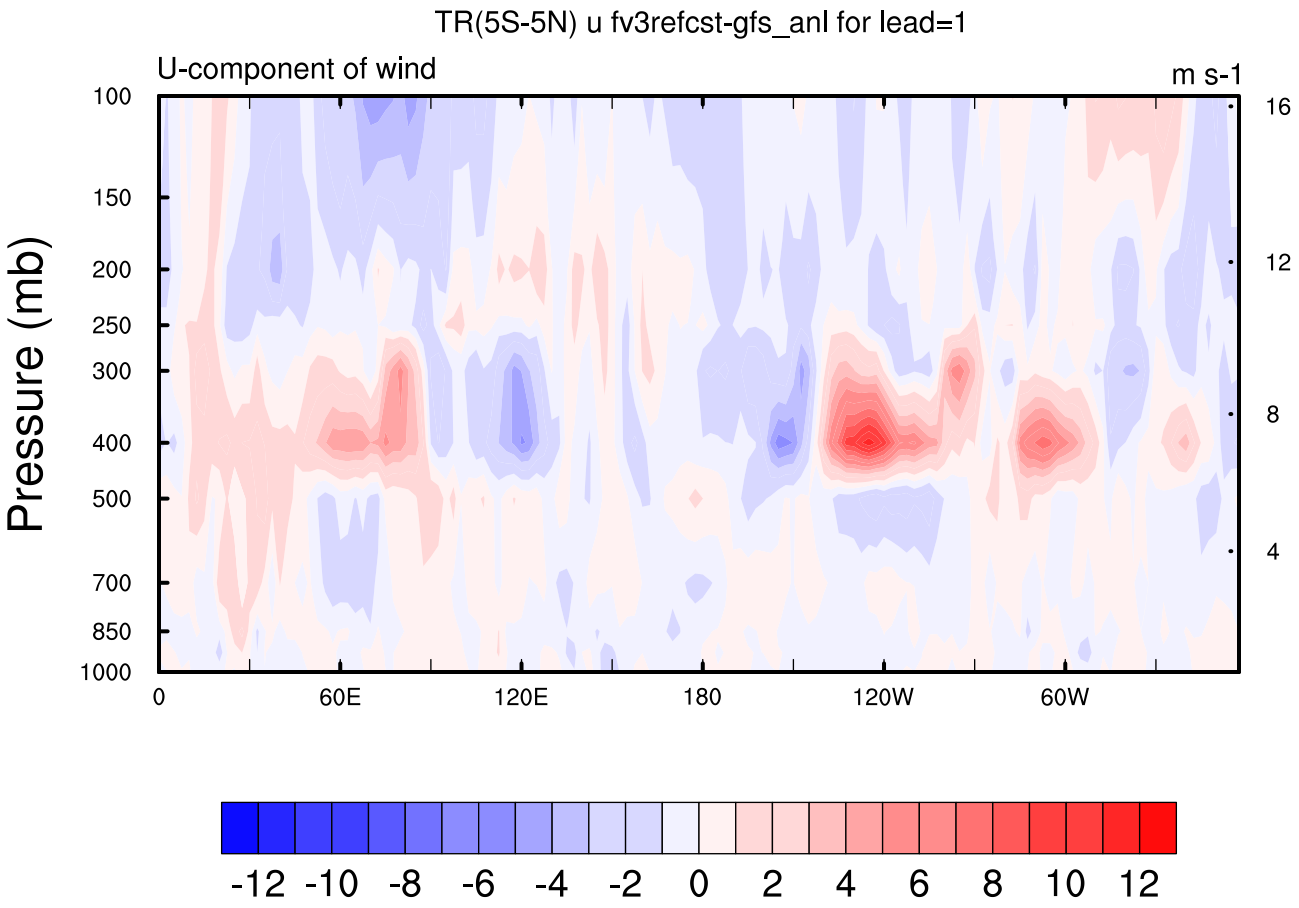

TR(5S-5N) vp fv3refcst-gfs_anl for lead=1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

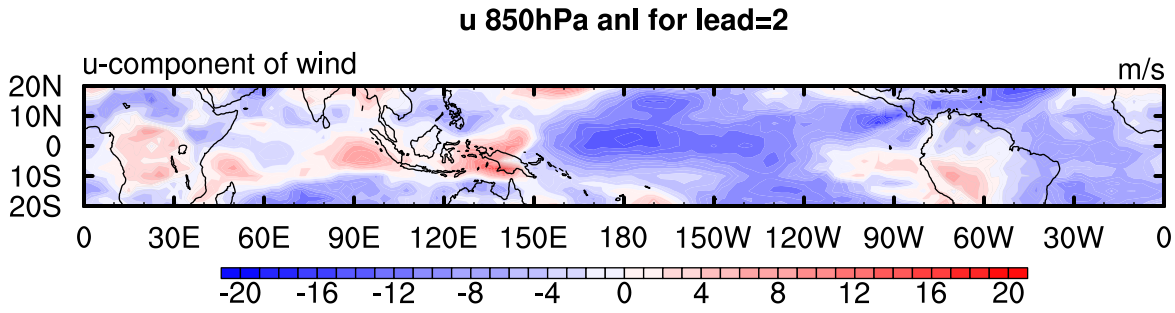

TR(5S-5N) u anl for lead=1
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-20
-16
-12
-8
-4
0
4
8
12
16
20

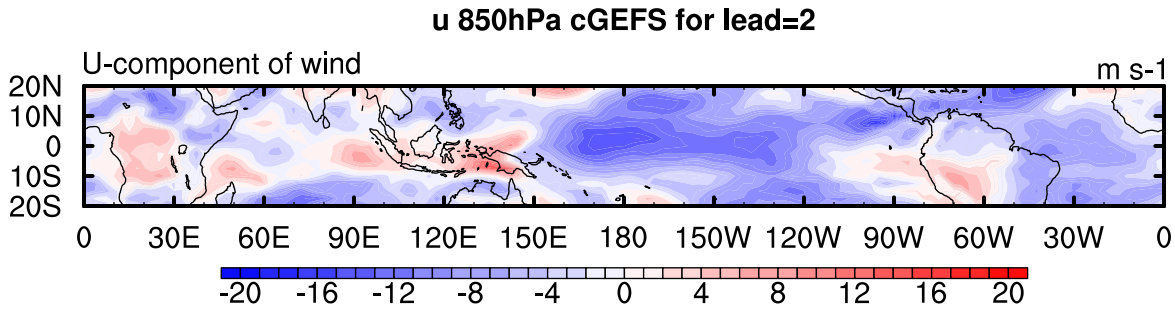

TR(5S-5N) u cGEFS for lead=1
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

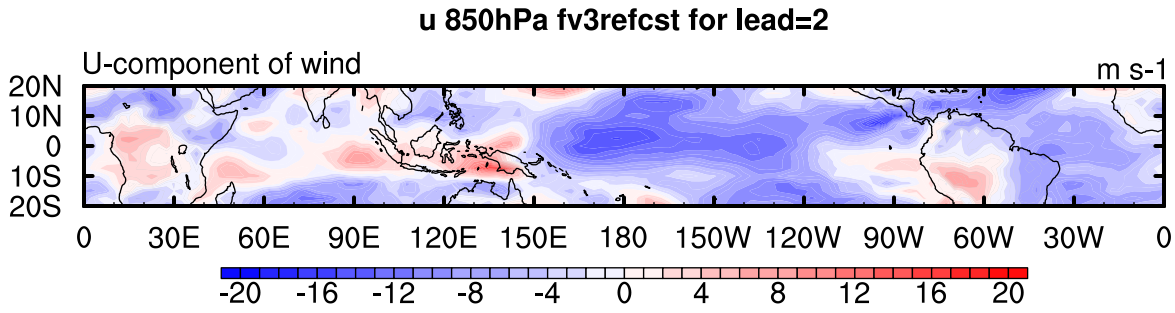

TR(5S-5N) u fv3refcst for lead=1
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

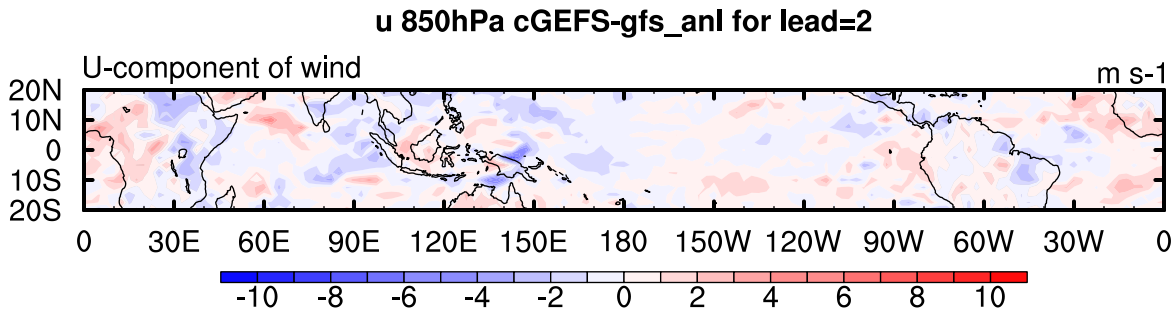

TR(5S-5N) u cGEFS-gfs_anl for lead=1
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

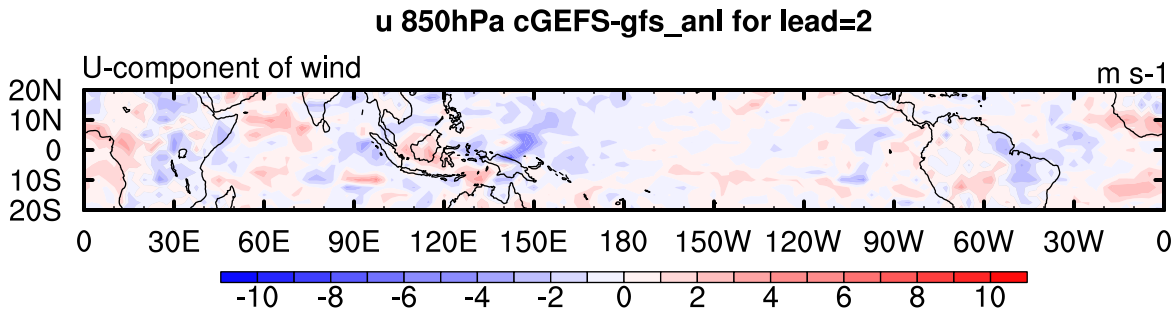

TR(5S-5N) u fv3refcst-gfs_anl for lead=1
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

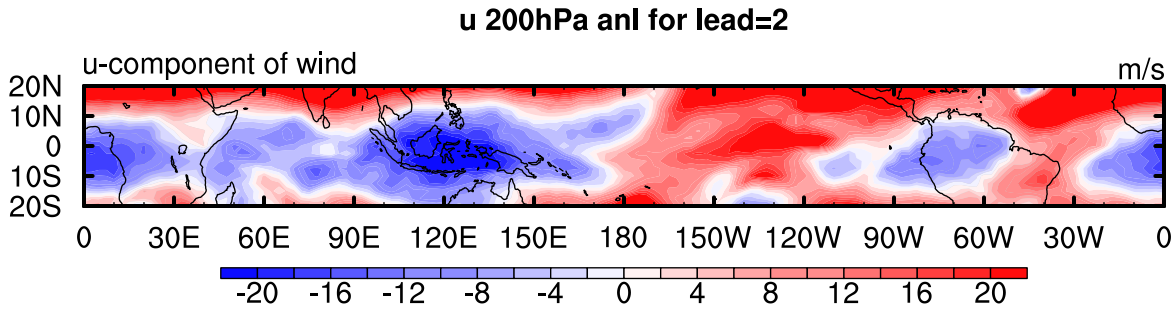

u 850hPa anl for lead=2
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

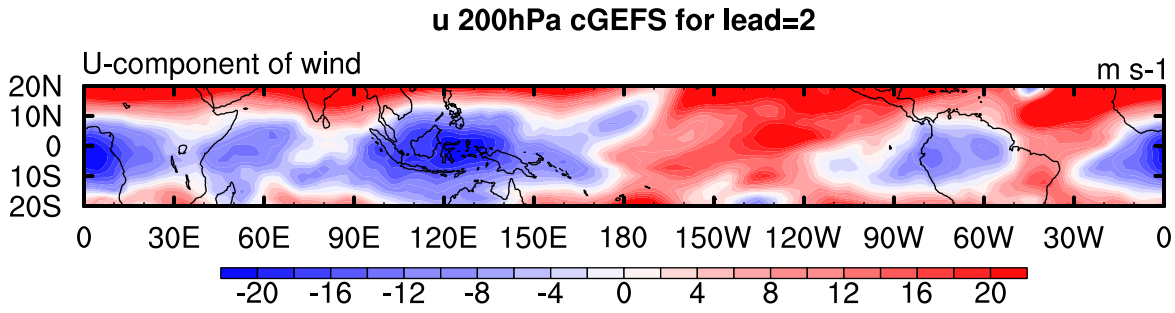

u 850hPa cGEFS for lead=2
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa fv3refcst for lead=2
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=2
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 850hPa cGEFS-gfs_anl for lead=2
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=2
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=2
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
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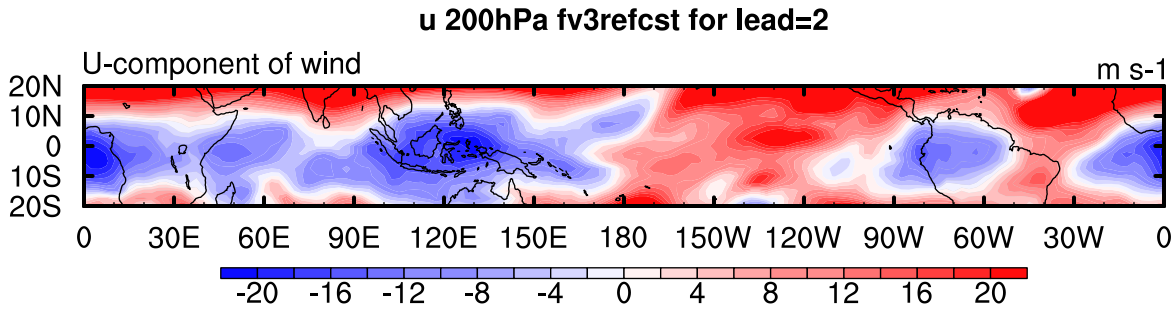
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=2
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
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-8
-4
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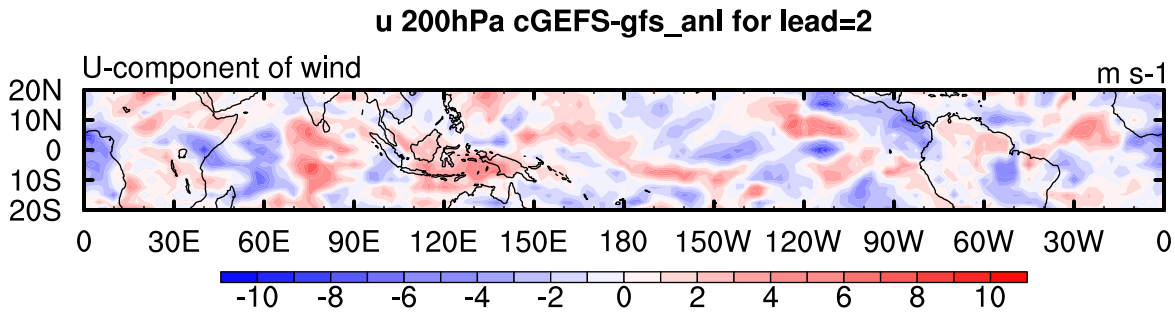
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=2
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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-10
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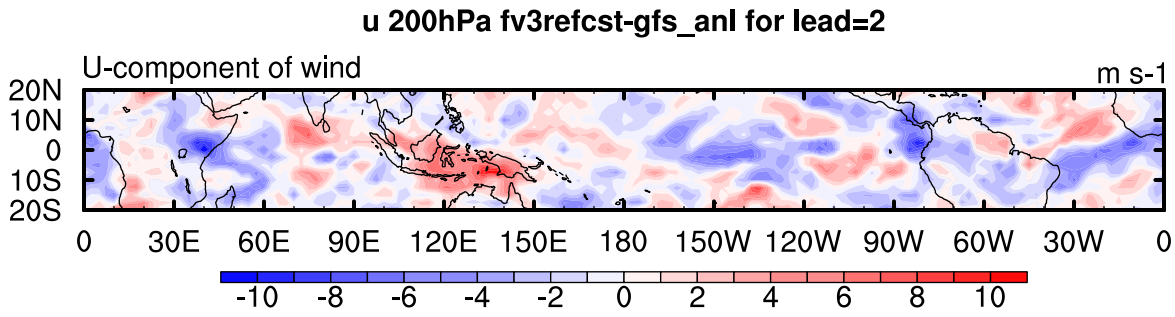
-2
0
2
4
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=2
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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30W
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-10
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-6
-4
-2
0
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4
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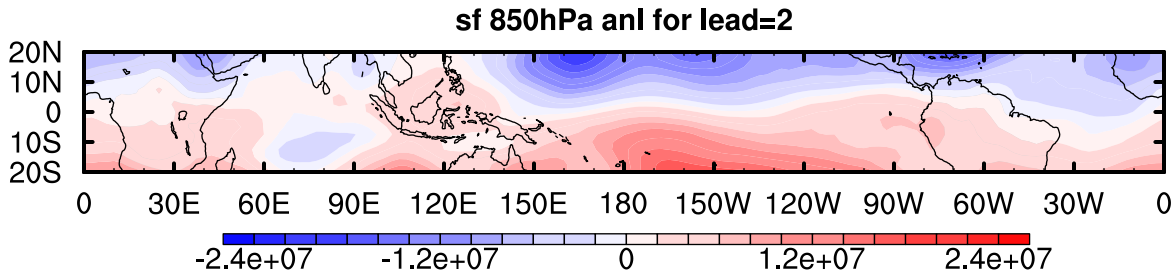
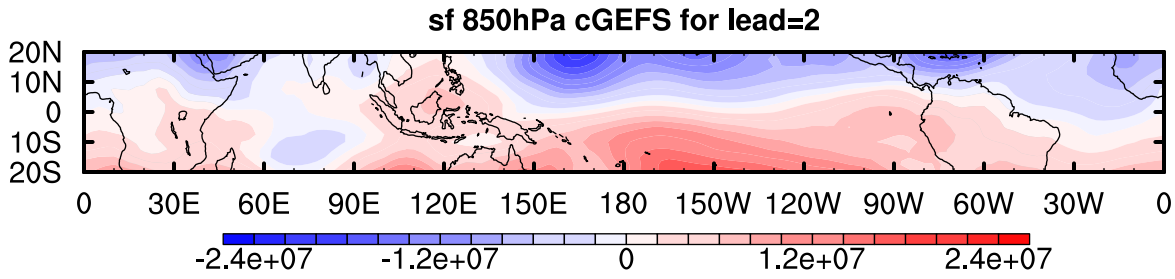
8
10


sf 850hPa anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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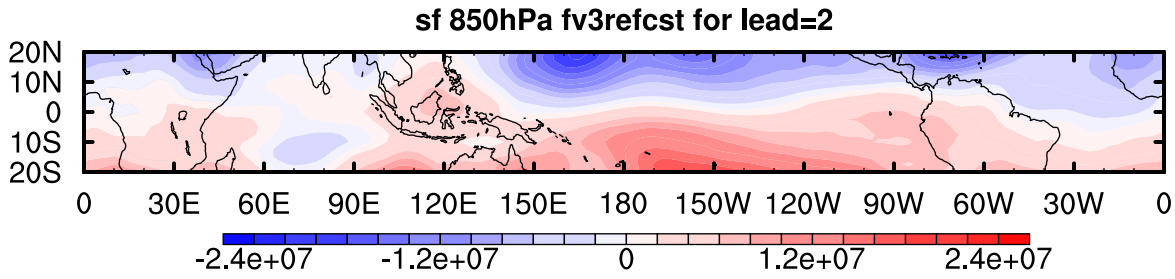
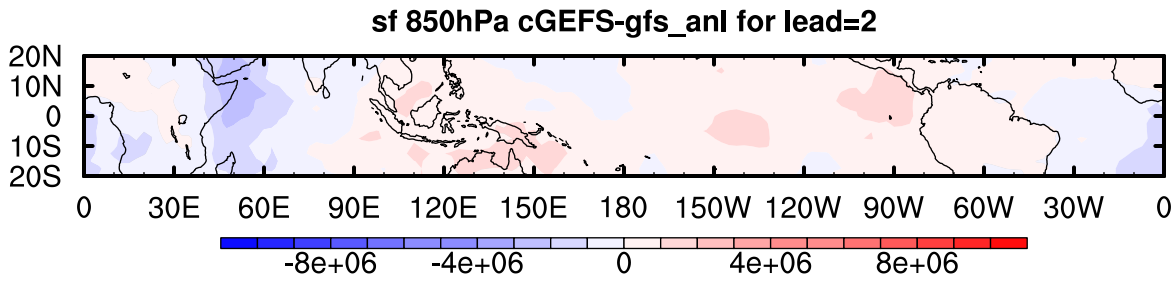
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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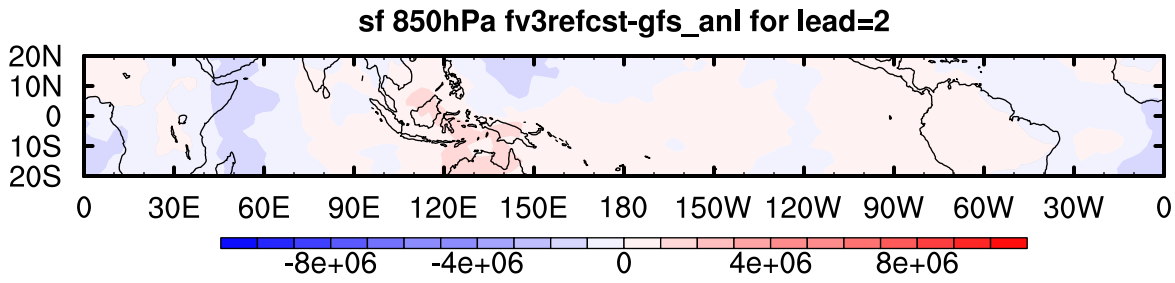
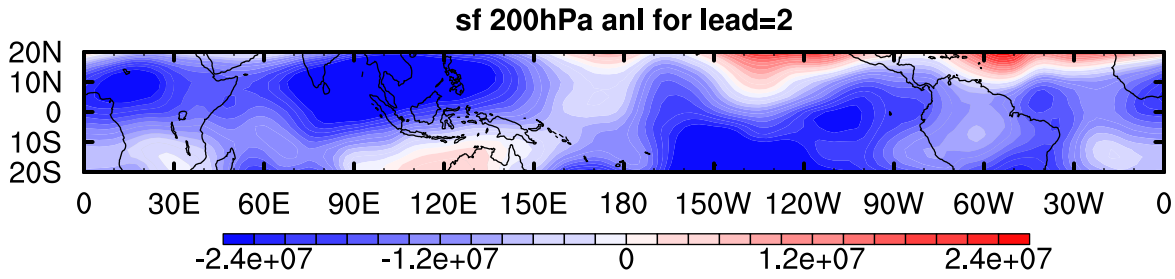
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
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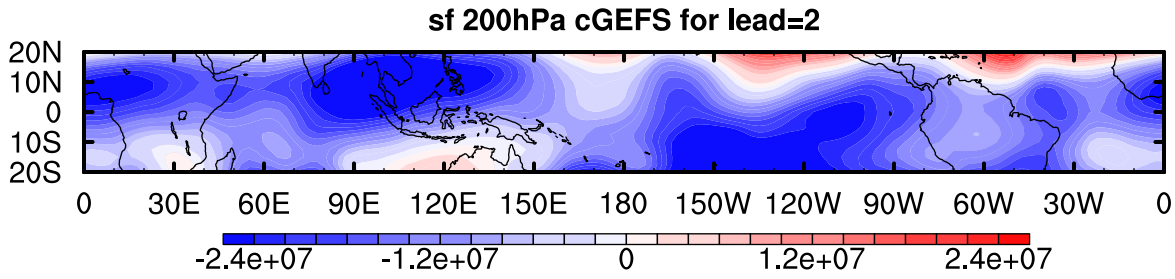
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS for lead=2
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10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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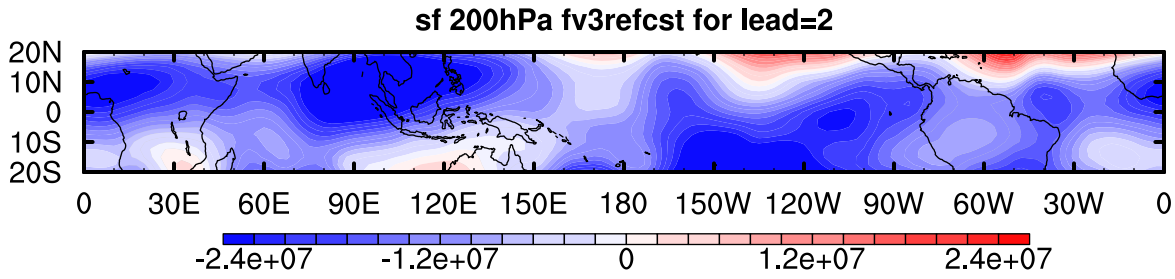
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
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60W
30W
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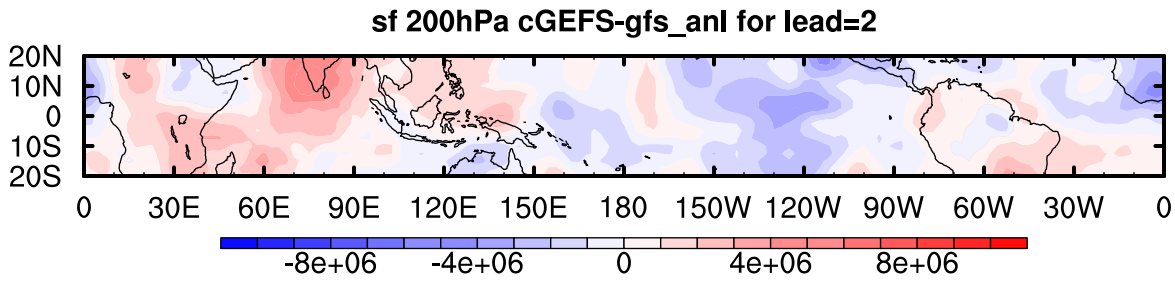
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
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150E
180
150W
120W
90W
60W
30W
0
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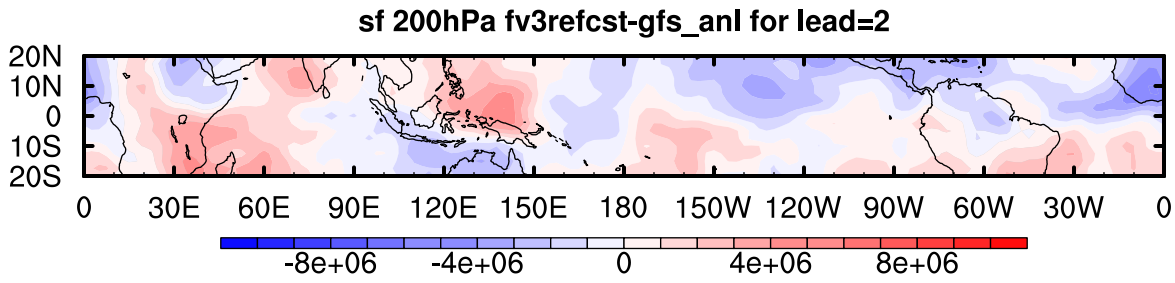
-4e+06
0
4e+06
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
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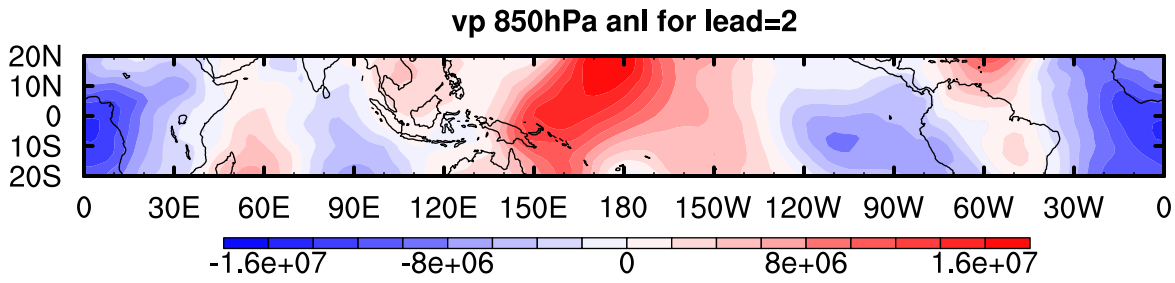
4e+06
8e+06


vp 850hPa anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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90W
60W
30W
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-1.6e+07
-8e+06
0
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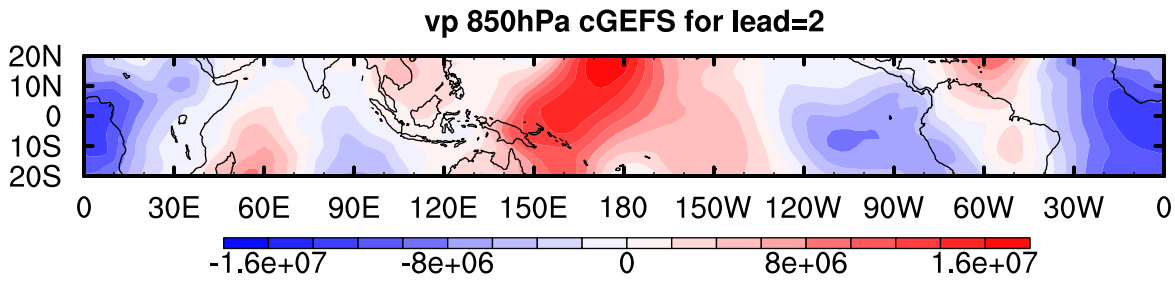
1.6e+07


vp 850hPa cGEFS for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
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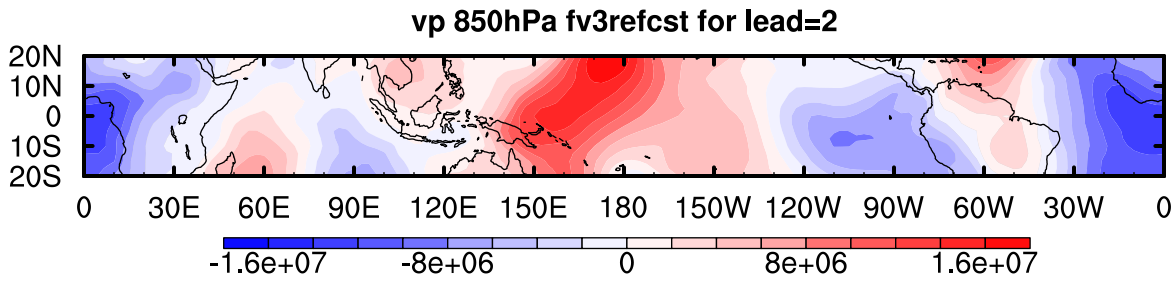
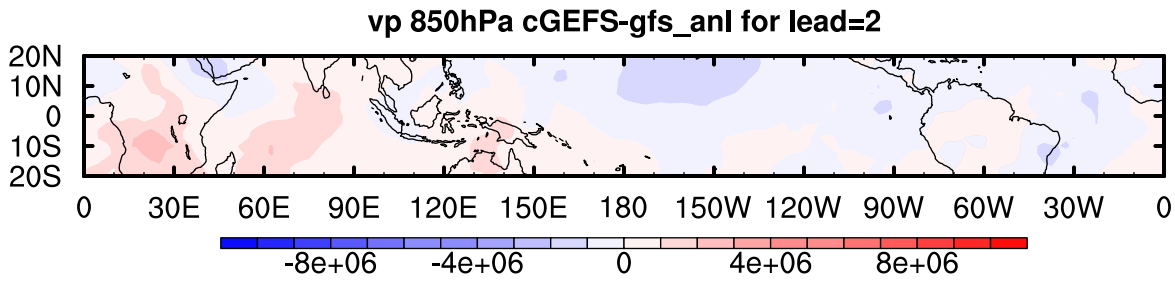
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
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180
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-4e+06
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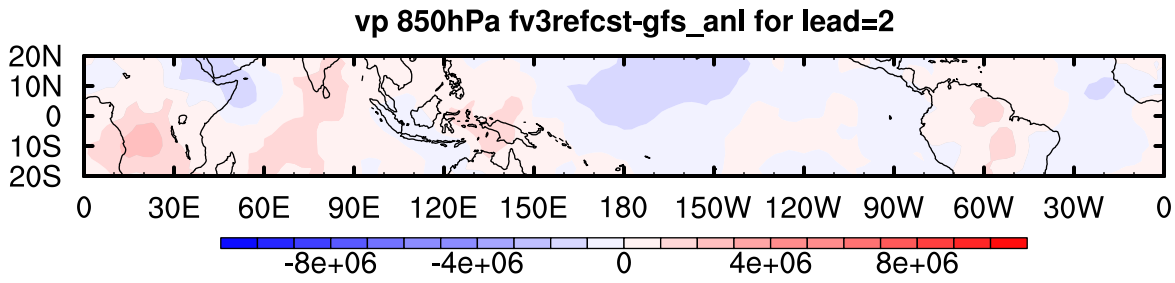
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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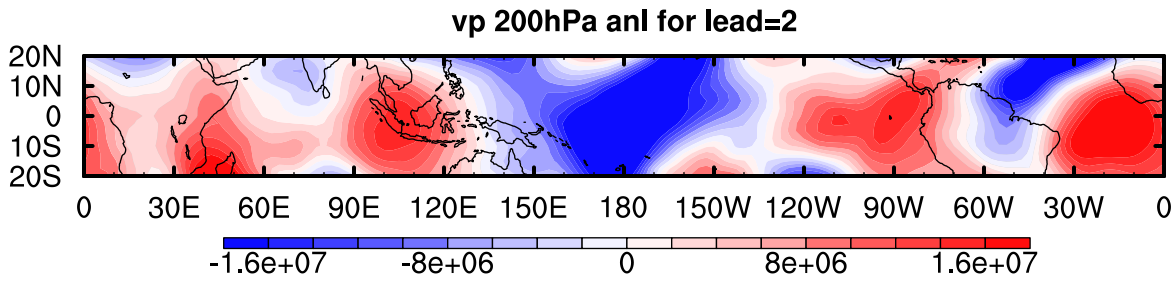
-4e+06
0
4e+06
8e+06


vp 200hPa anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
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90W
60W
30W
0
-1.6e+07
-8e+06
0
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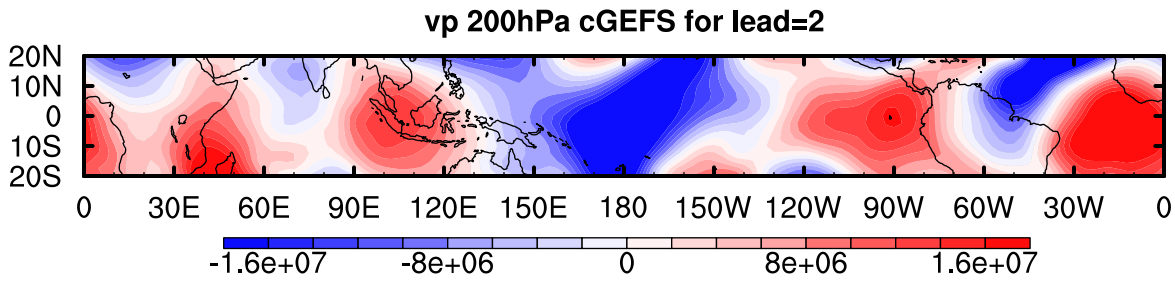
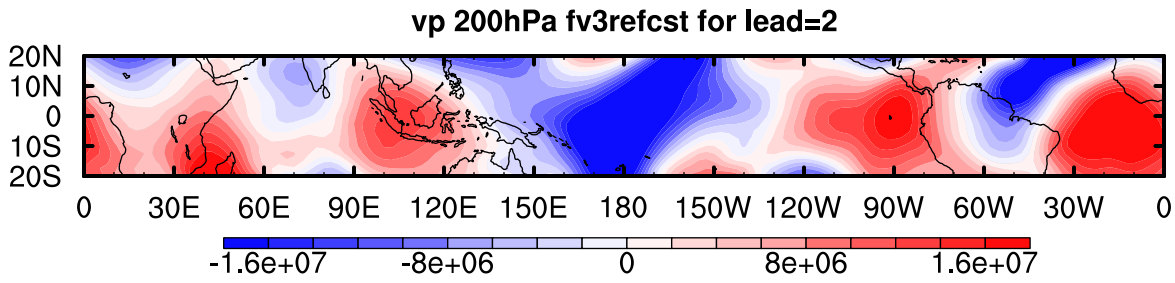
1.6e+07


vp 200hPa cGEFS for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa fv3refcst for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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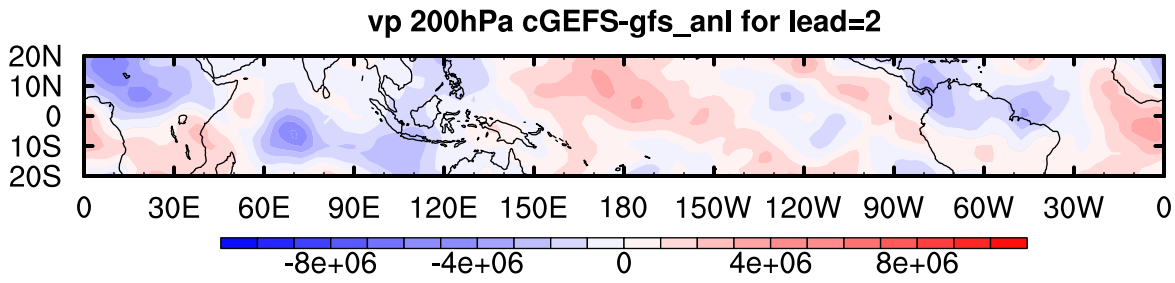
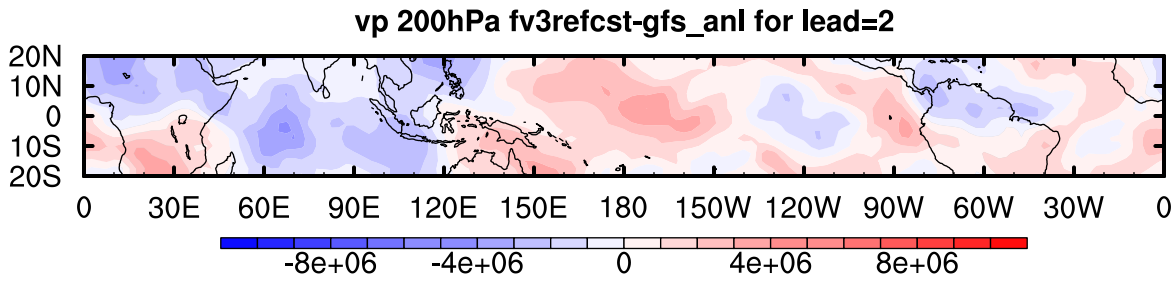
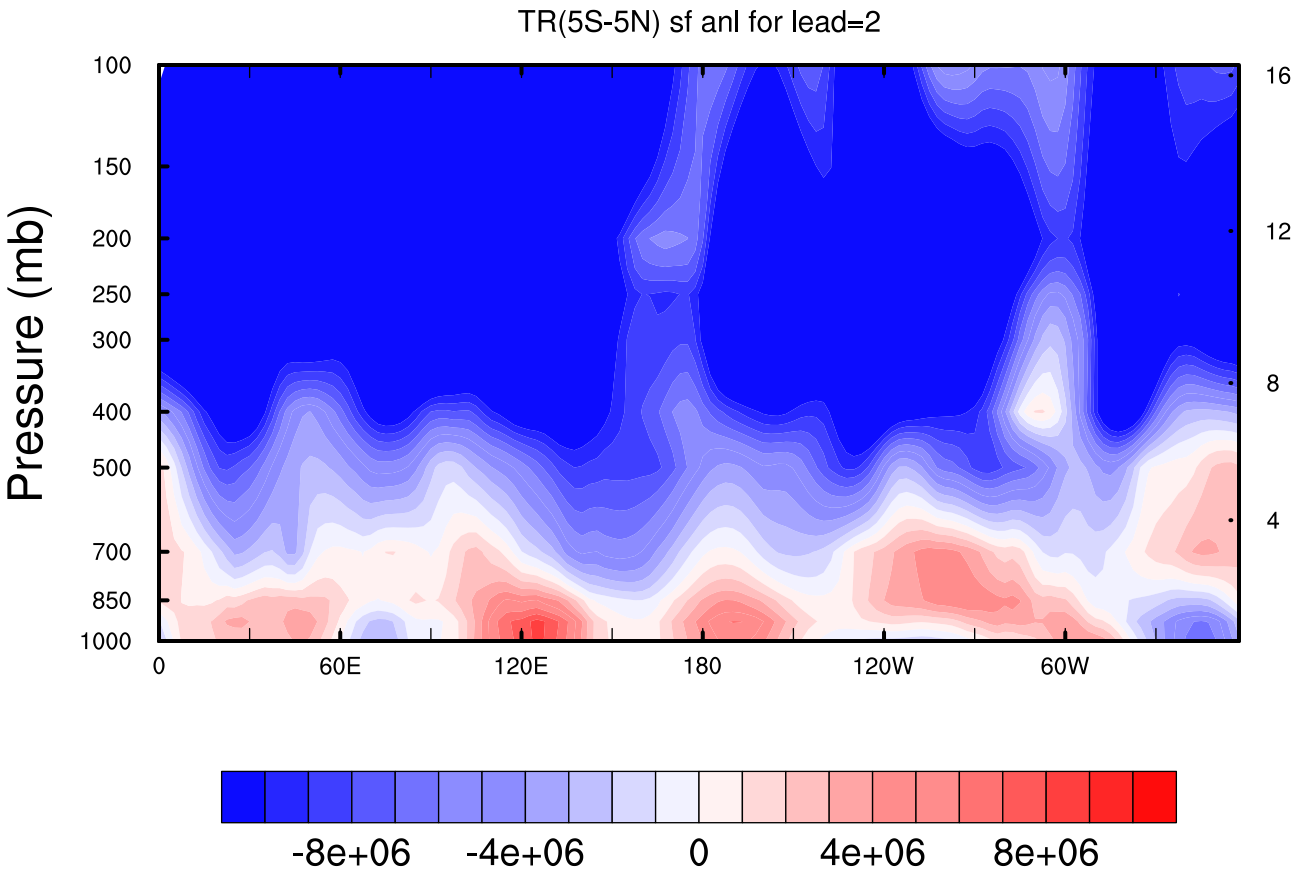
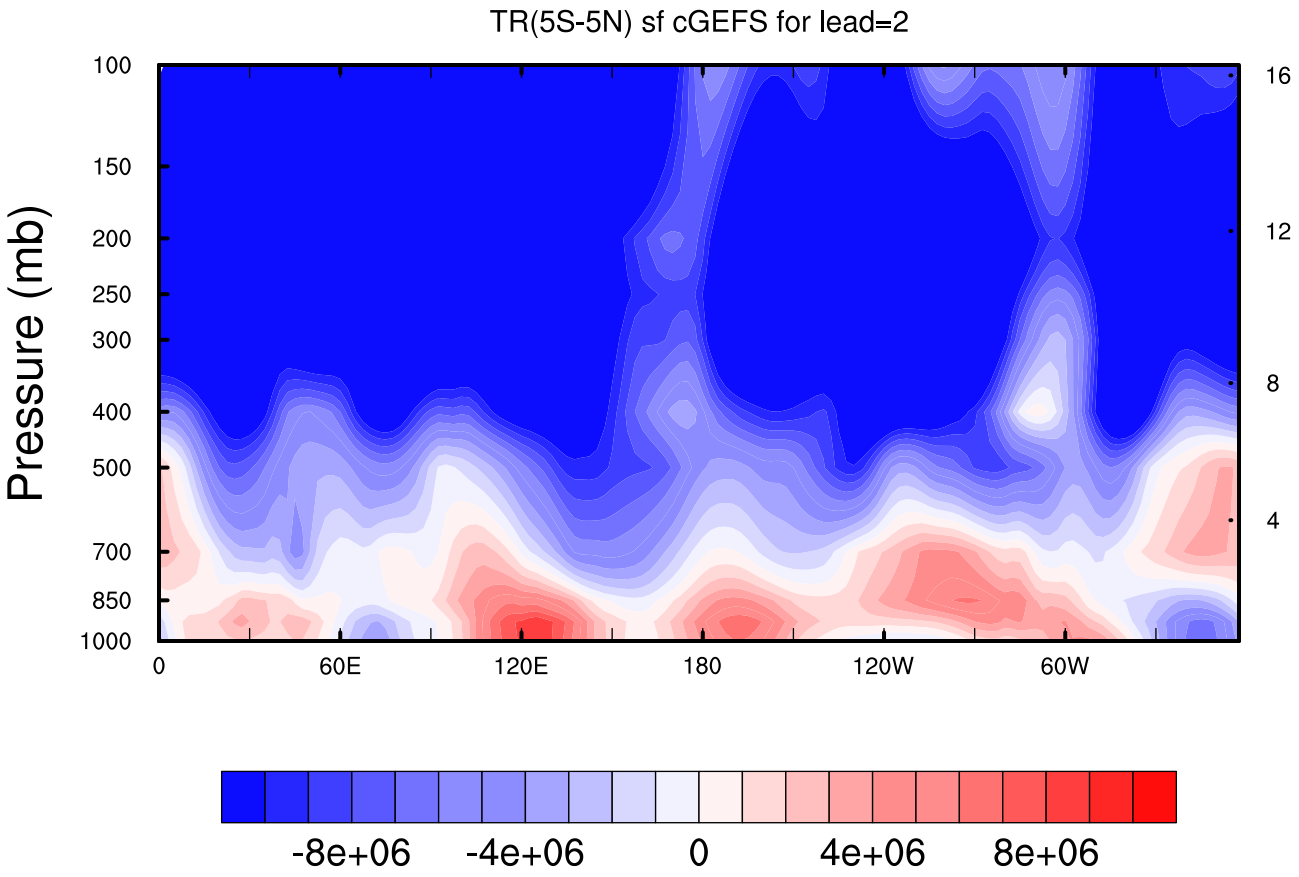
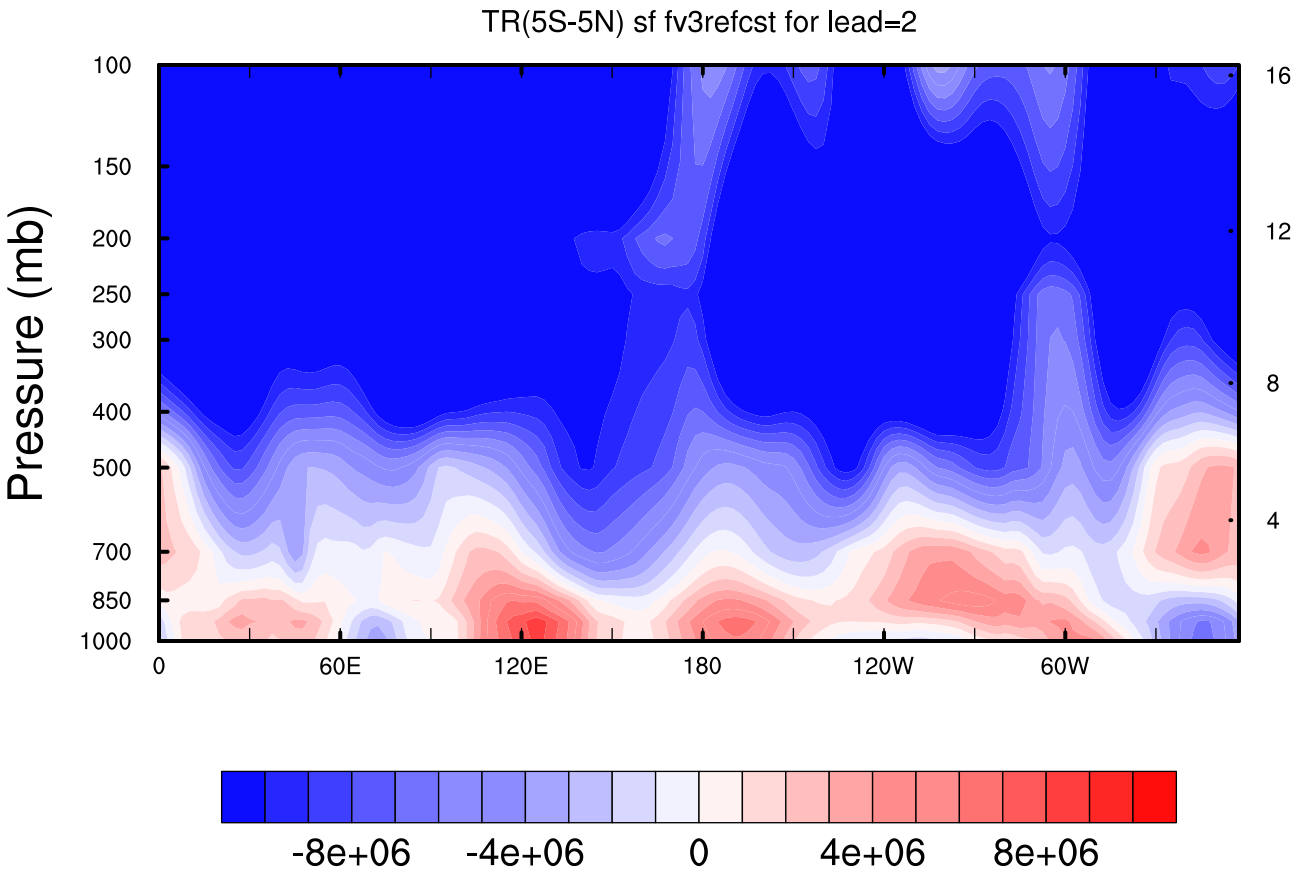
1.6e+07

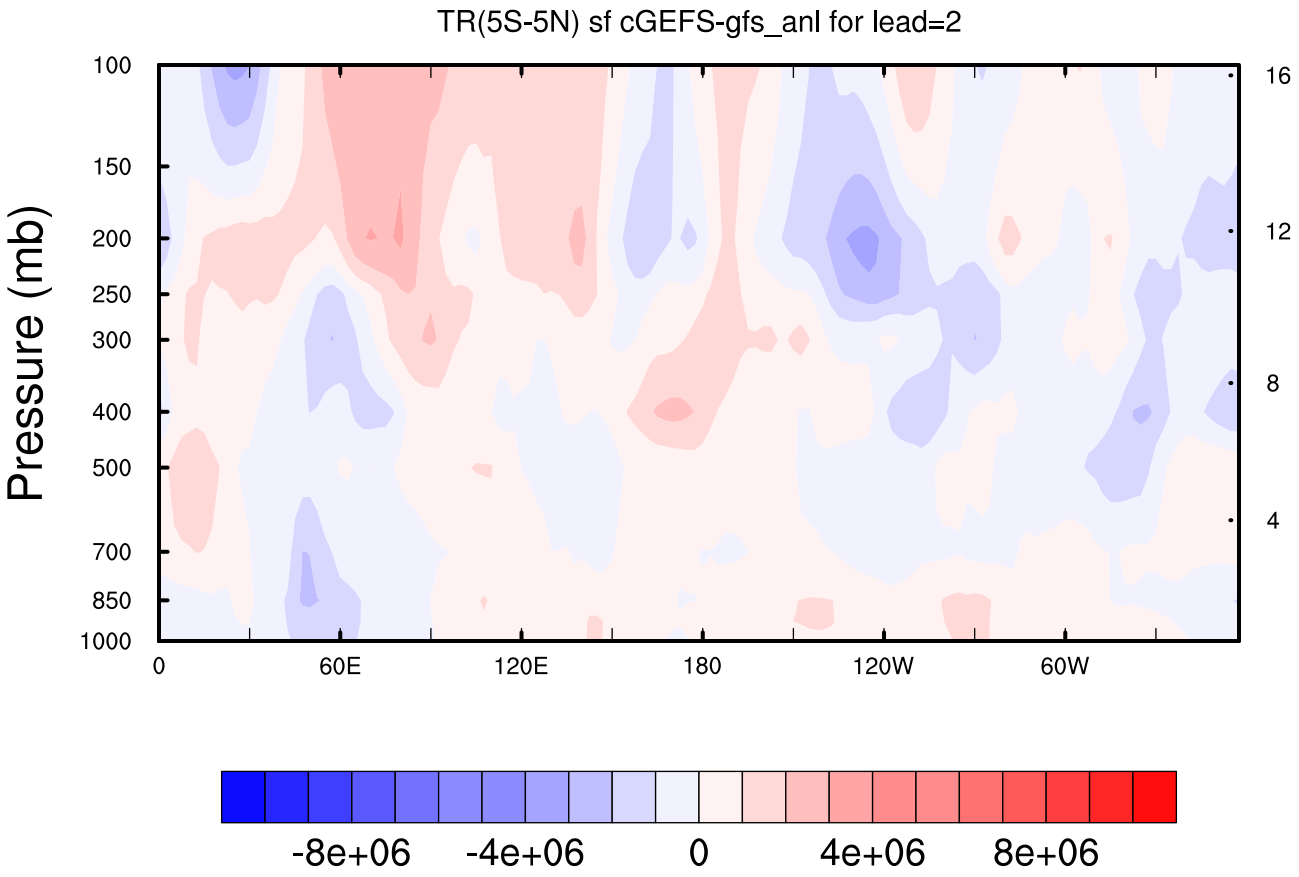

vp 200hPa cGEFS-gfs_anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

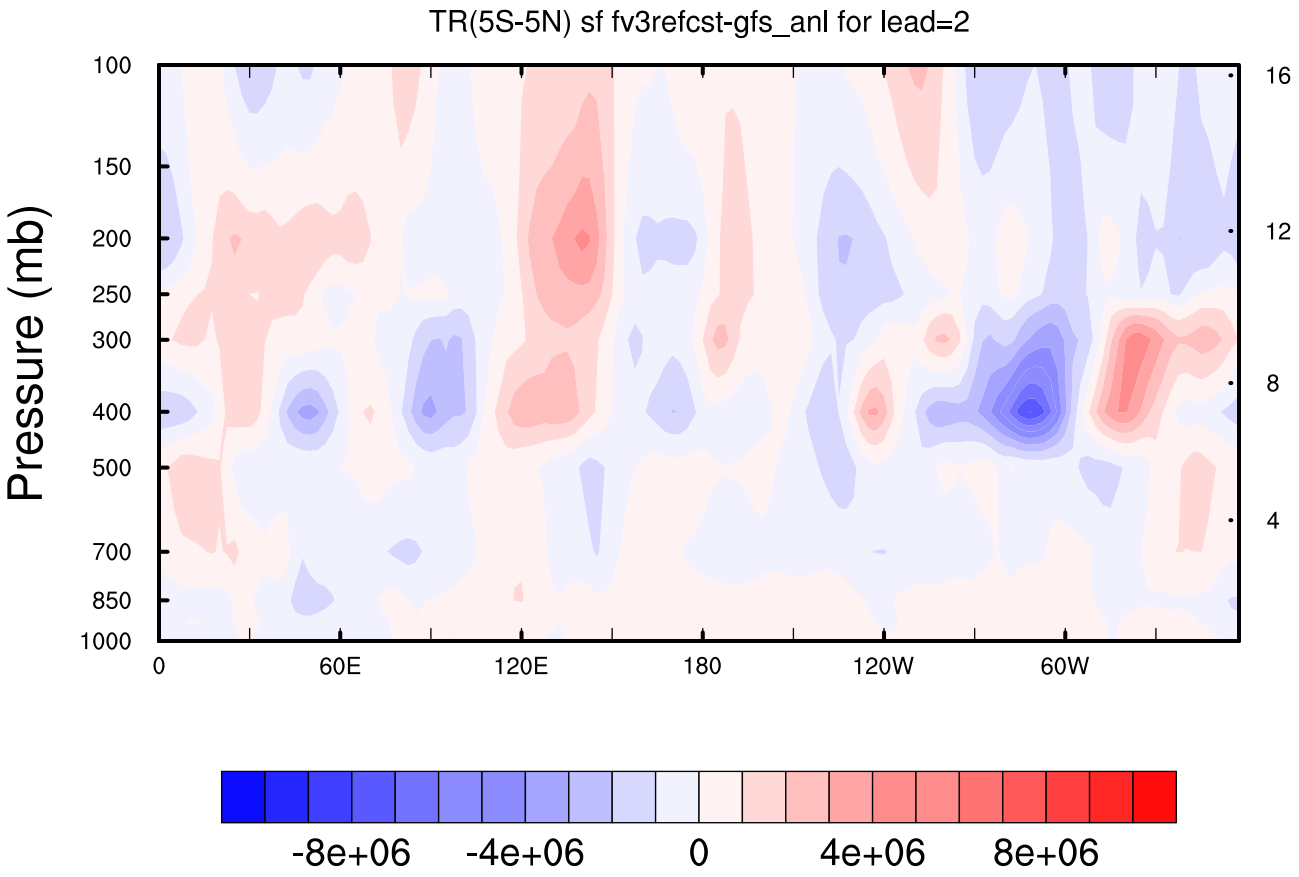

vp 200hPa fv3refcst-gfs_anl for lead=2
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

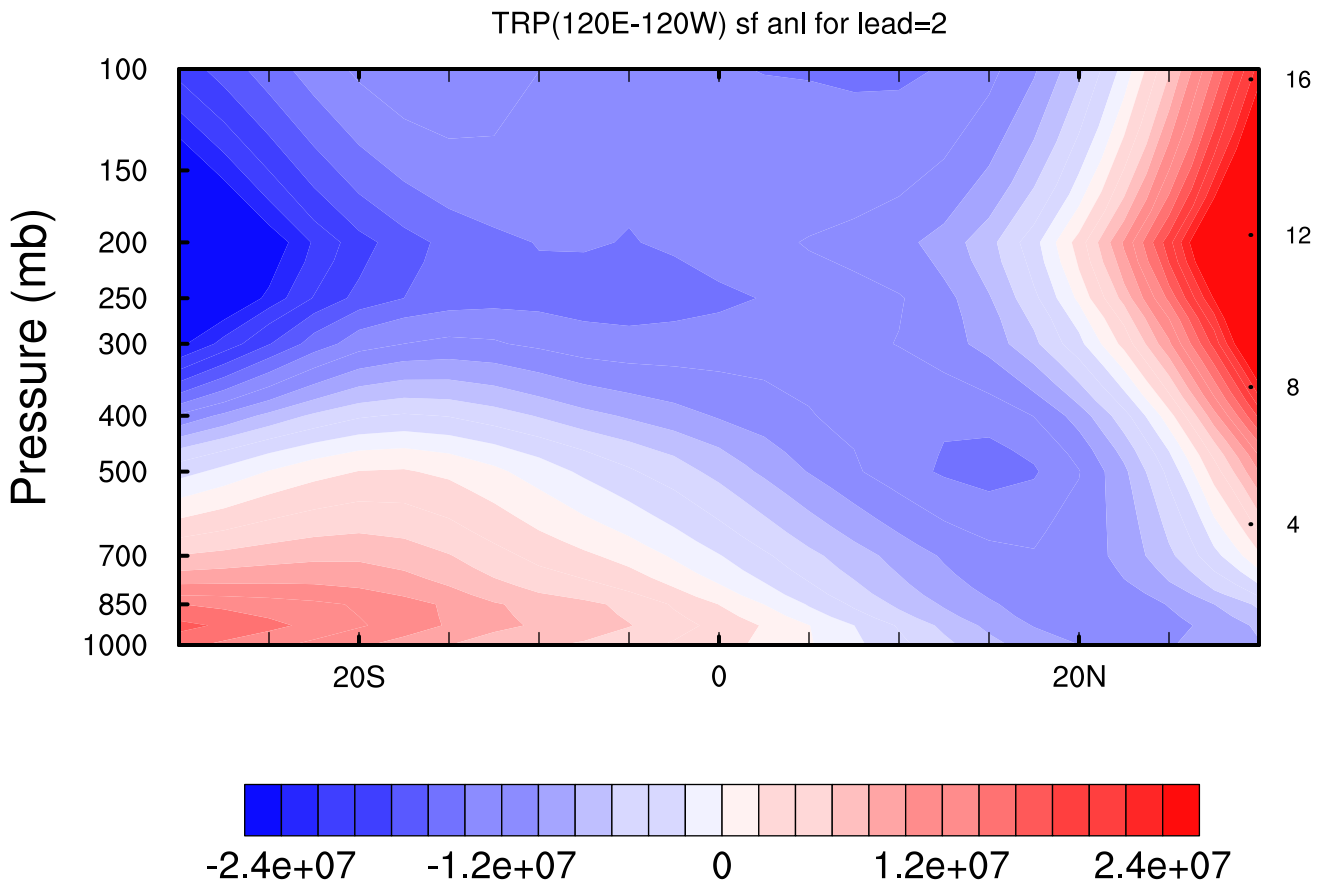

TR(5S-5N) sf anl for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

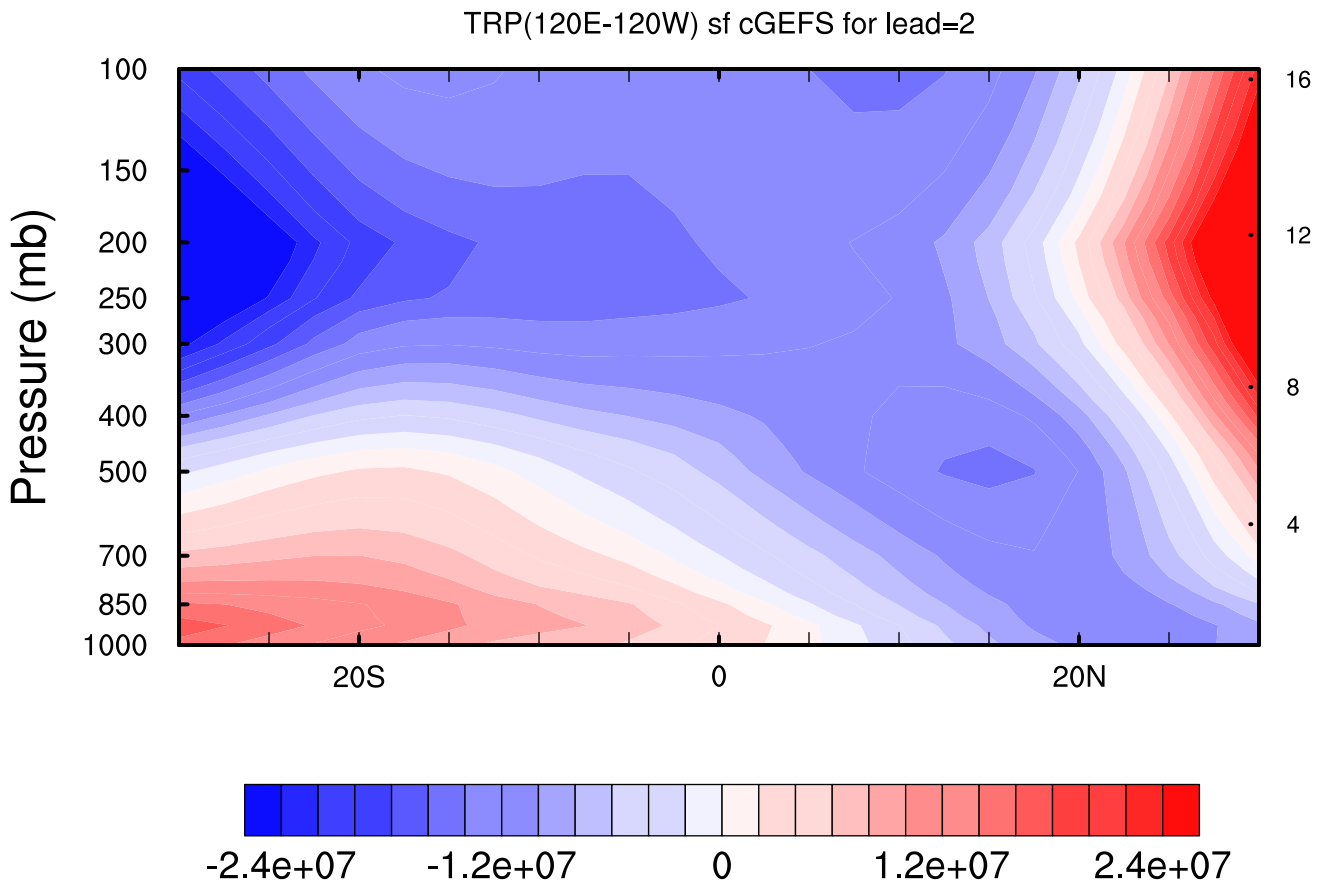

TR(5S-5N) sf cGEFS for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

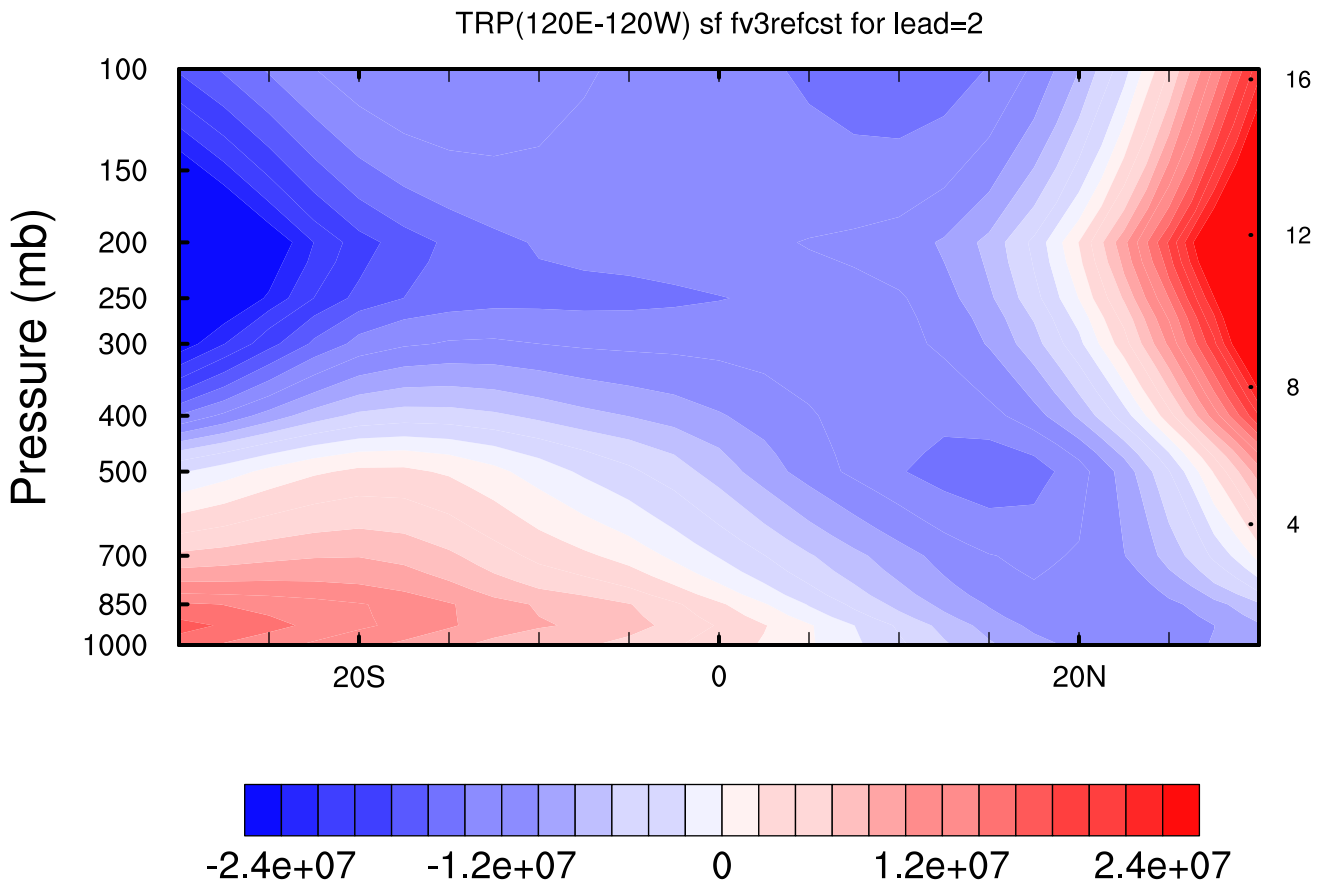

TR(5S-5N) sf fv3refcst for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

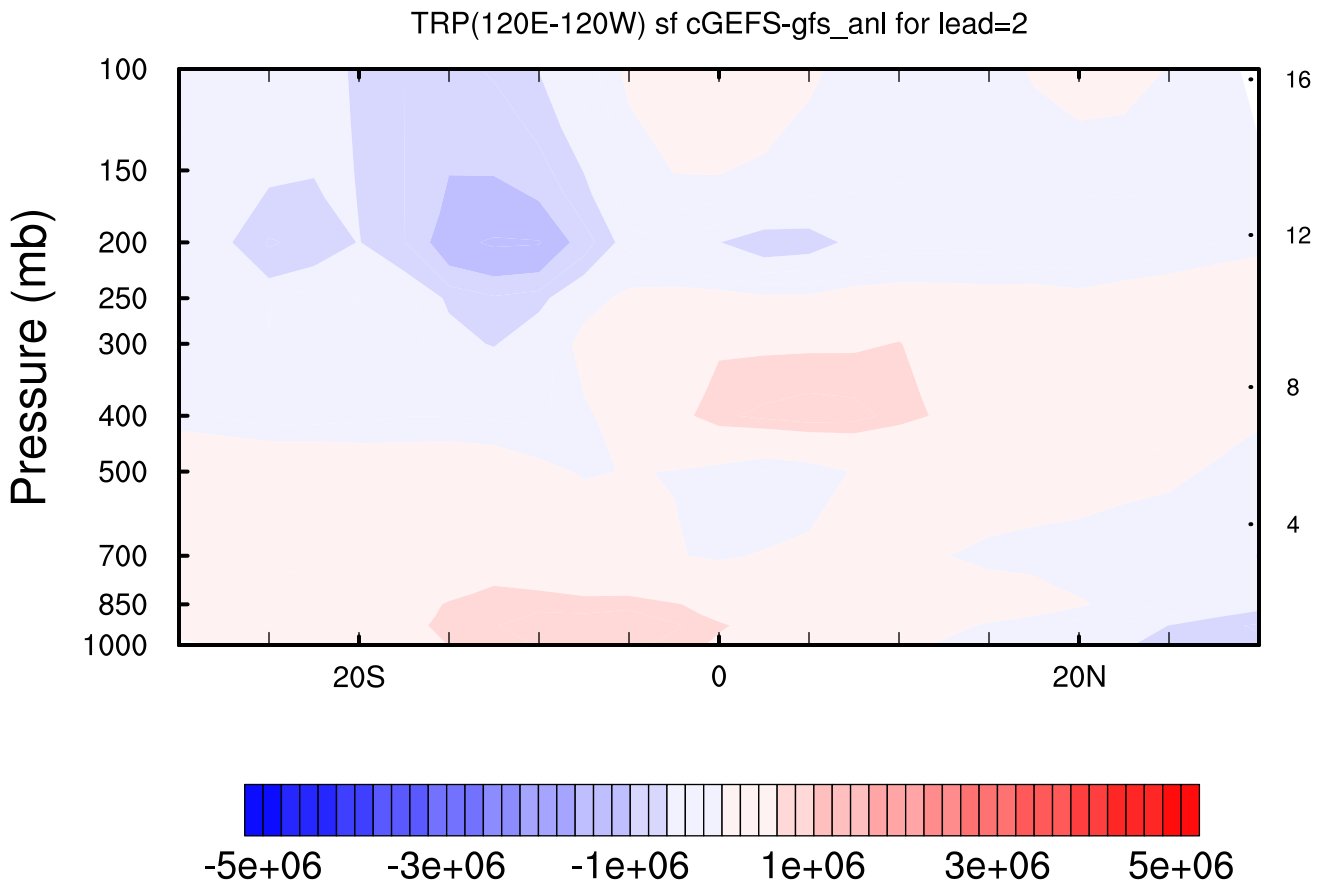

TR(5S-5N) sf cGEFS-gfs_anl for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

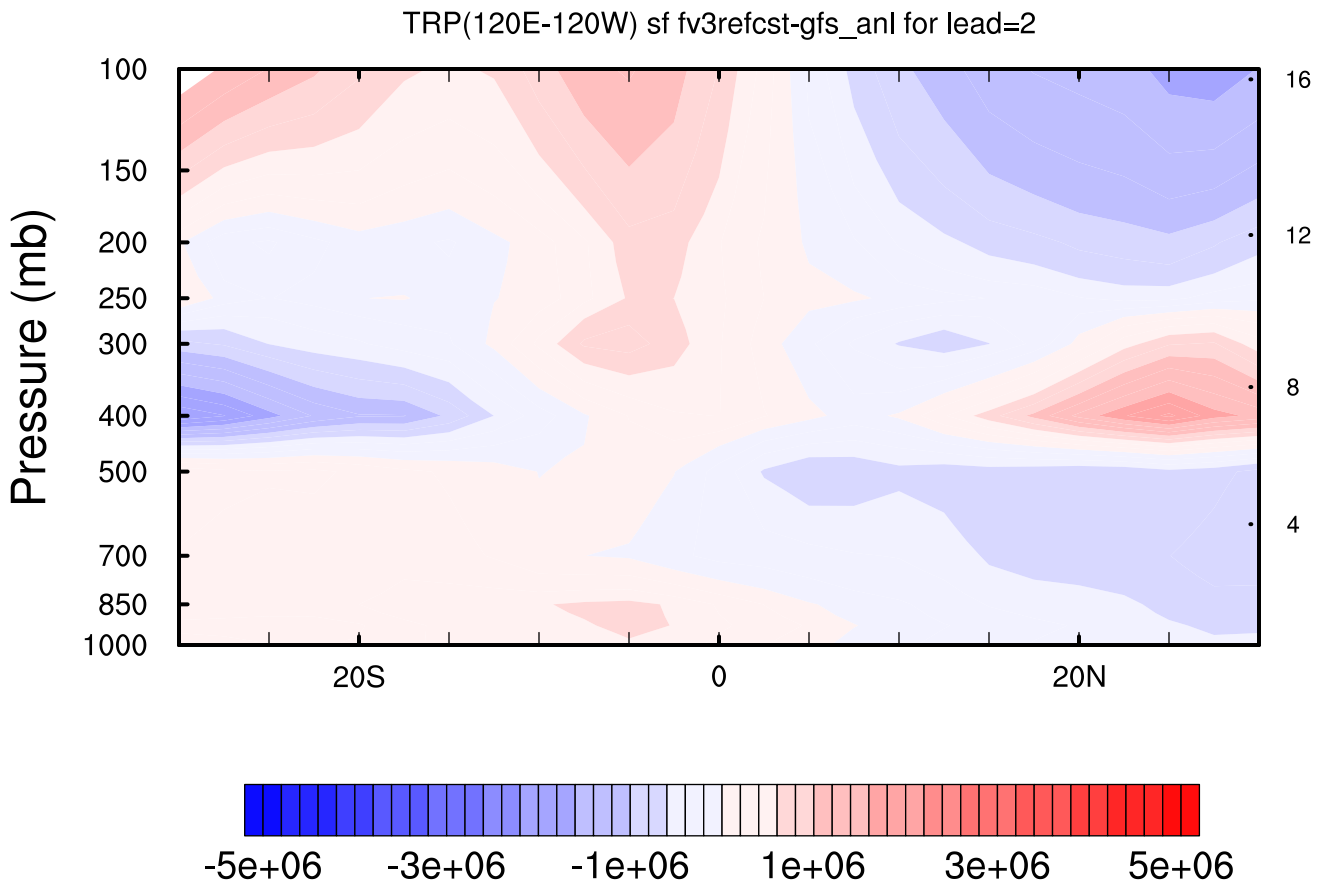

TR(5S-5N) sf fv3refcst-gfs_anl for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

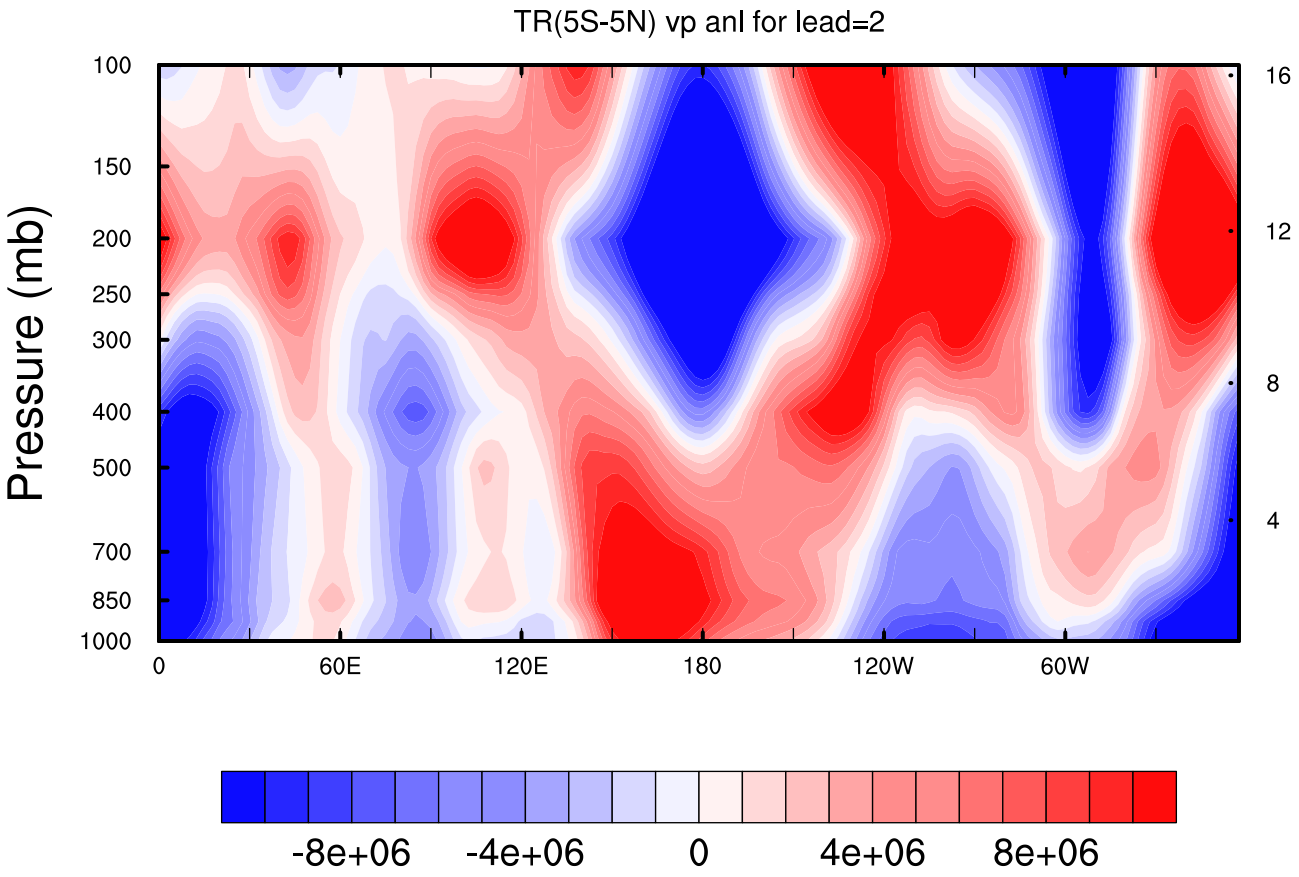

TRP(120E-120W) sf anl for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

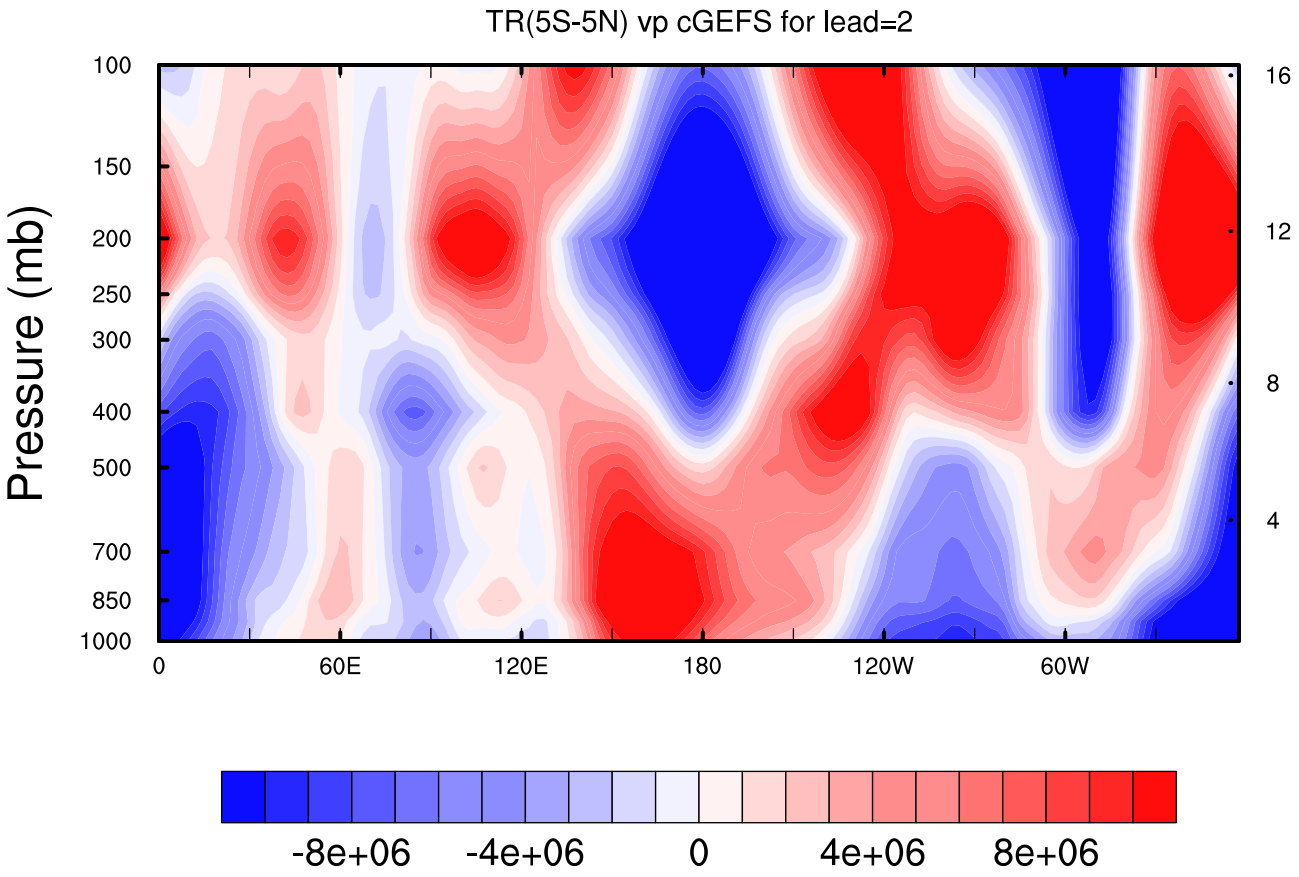

TRP(120E-120W) sf cGEFS for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

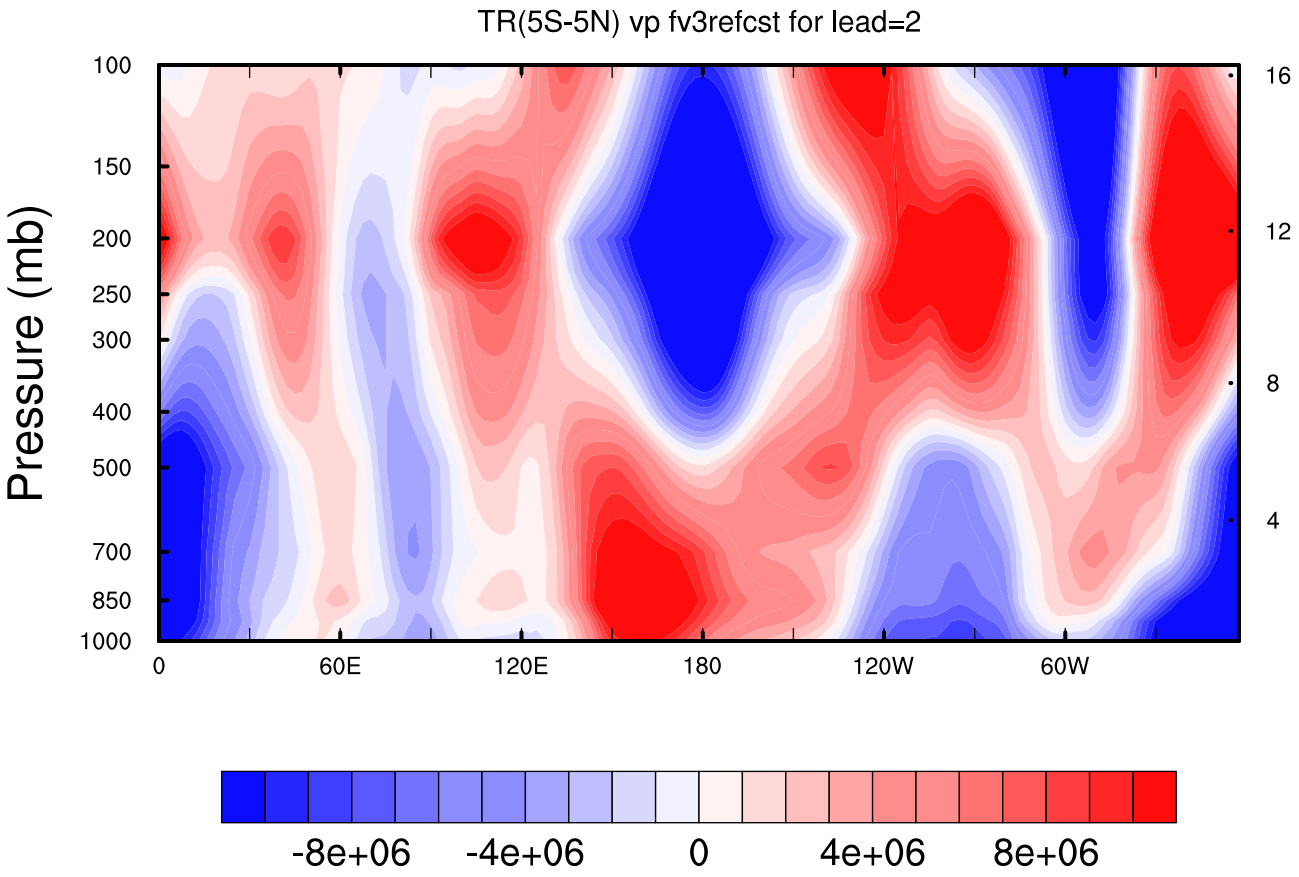

TRP(120E-120W) sf fv3refcst for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

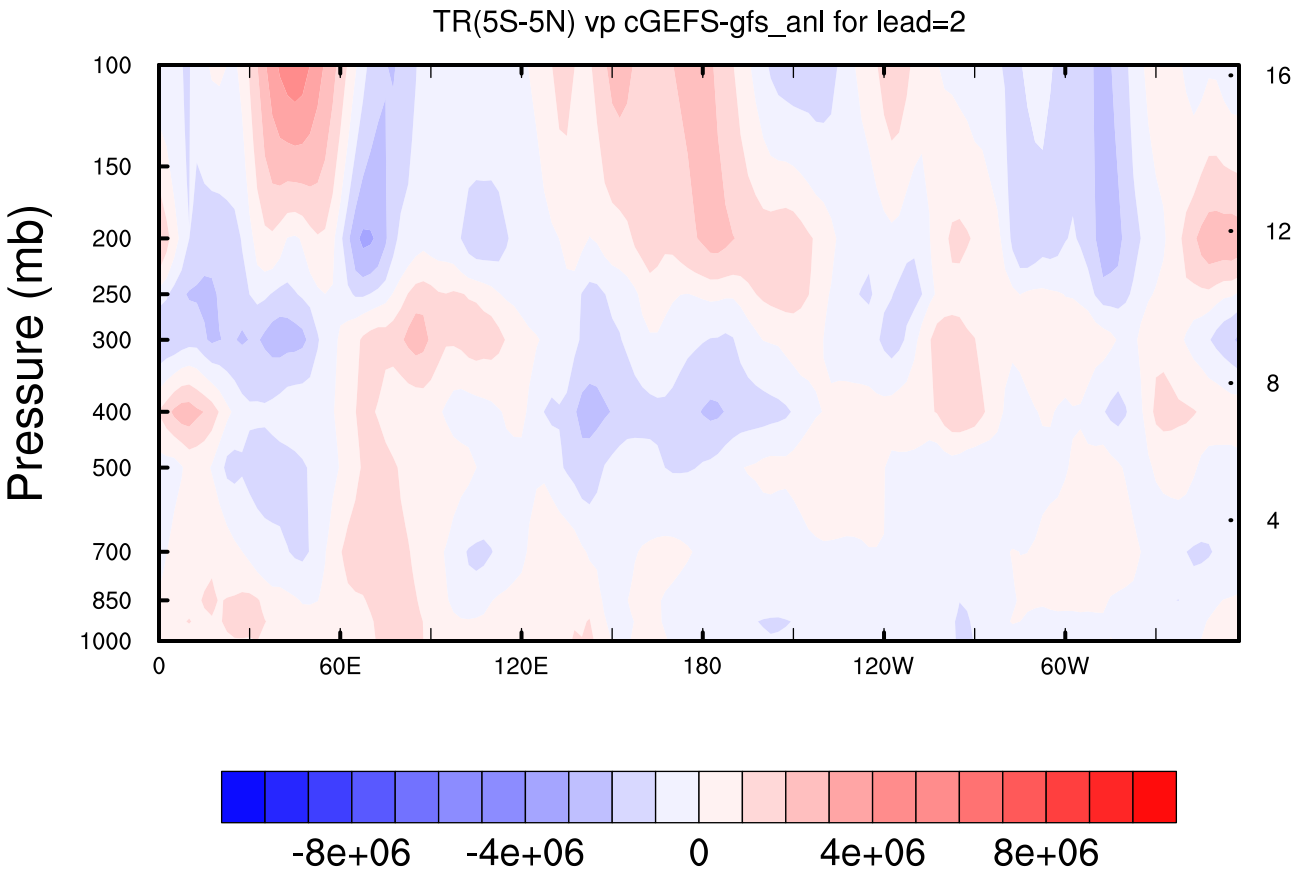

TRP(120E-120W) sf cGEFS-gfs_anl for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

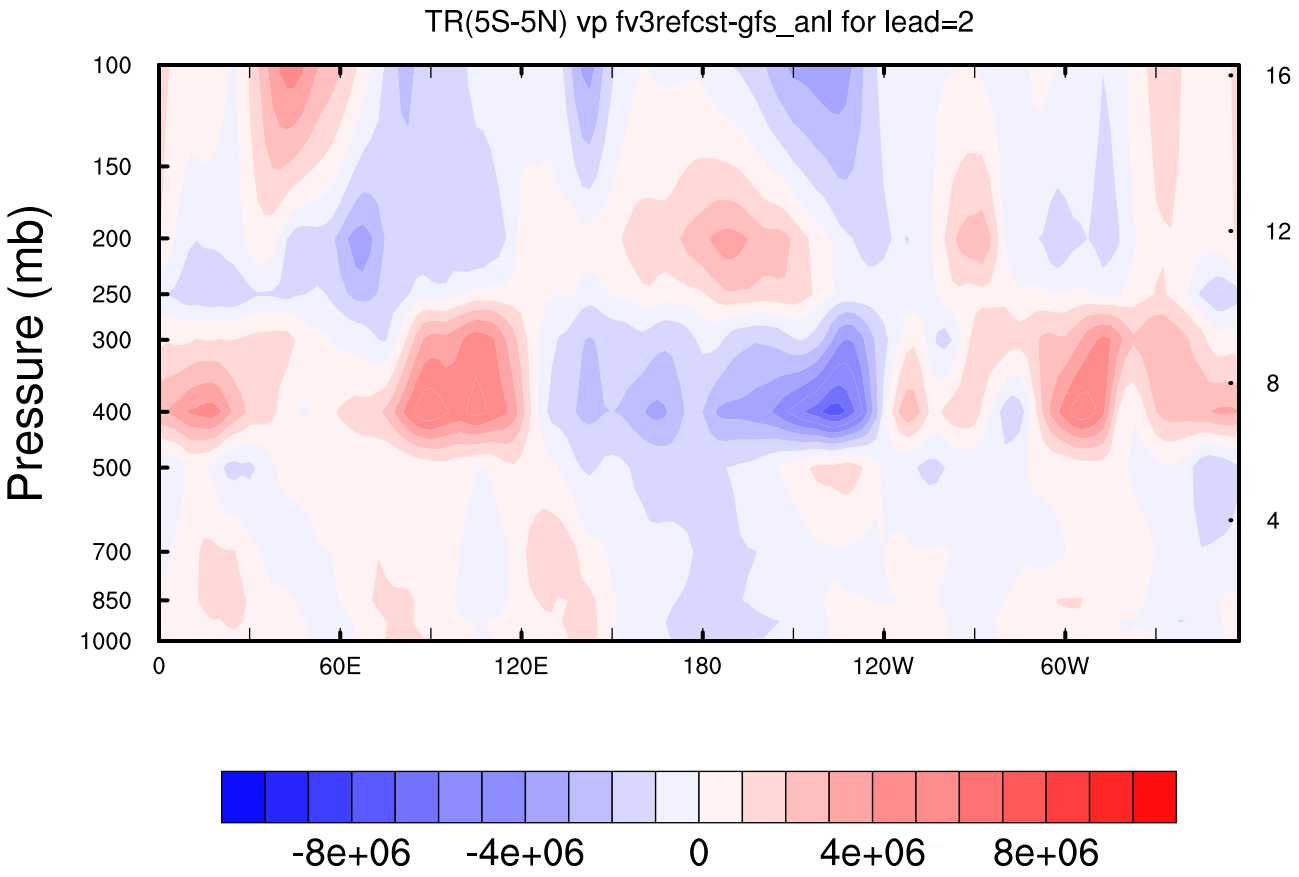

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

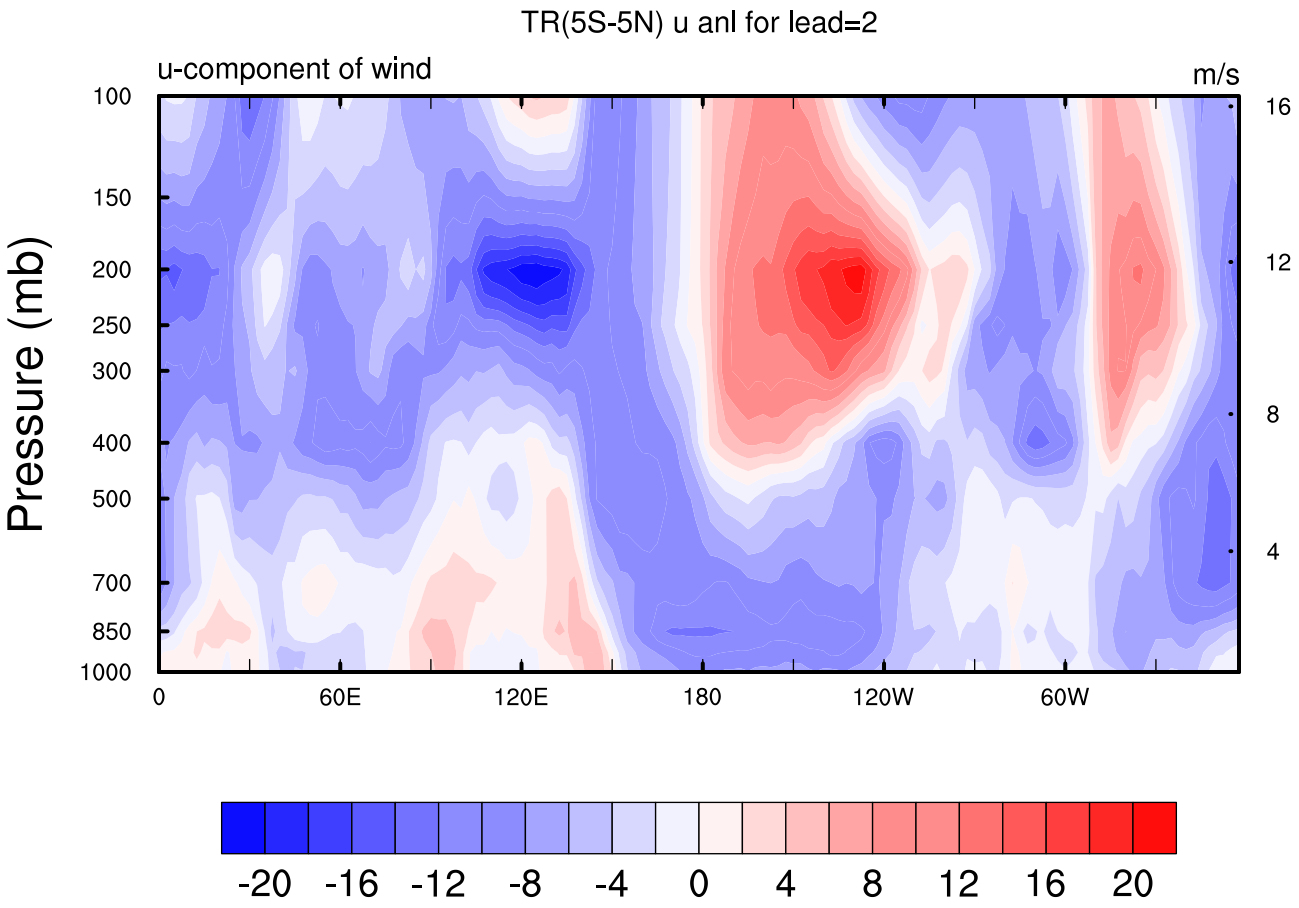

TR(5S-5N) vp anl for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

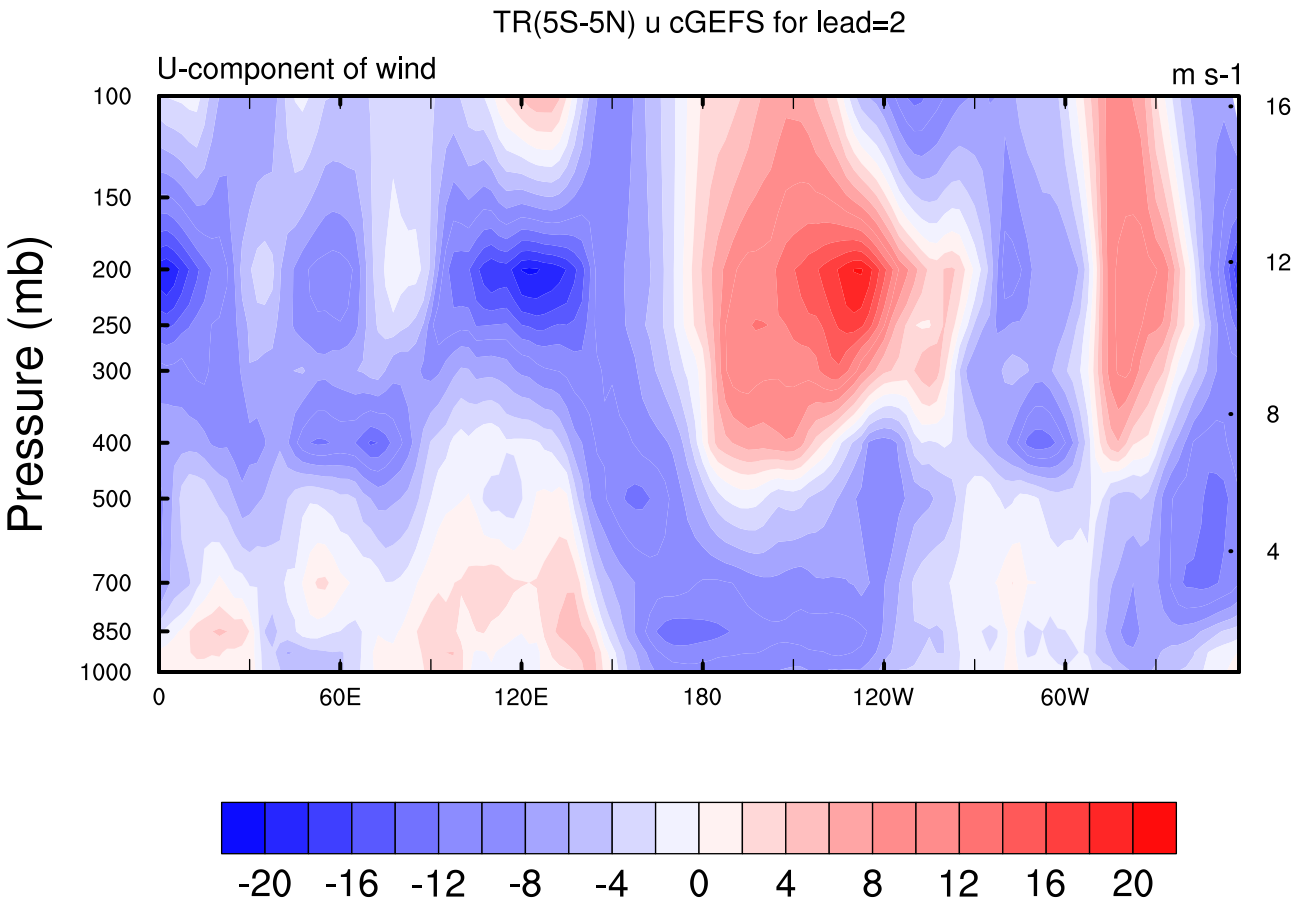

TR(5S-5N) vp cGEFS for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

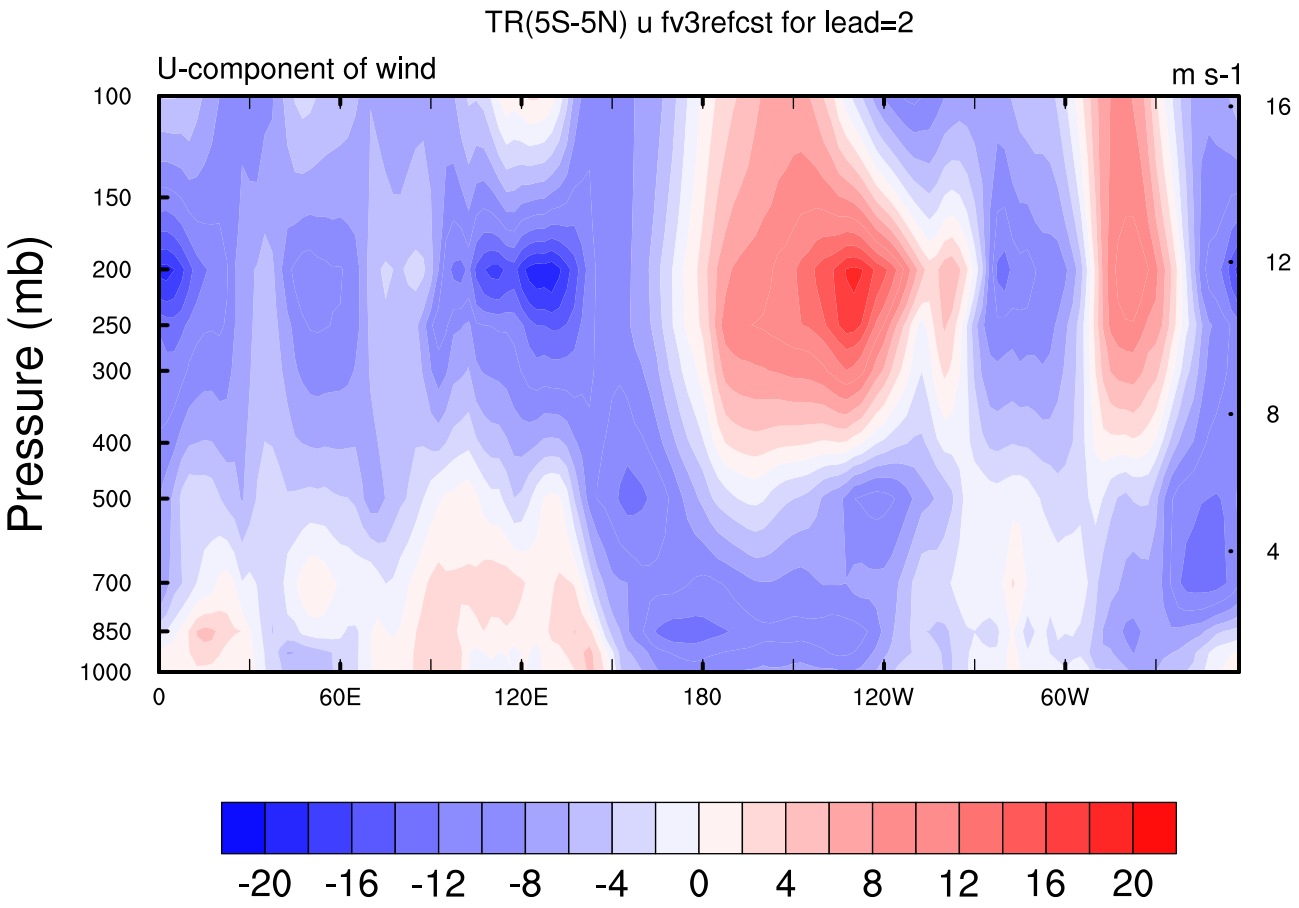

TR(5S-5N) vp fv3refcst for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

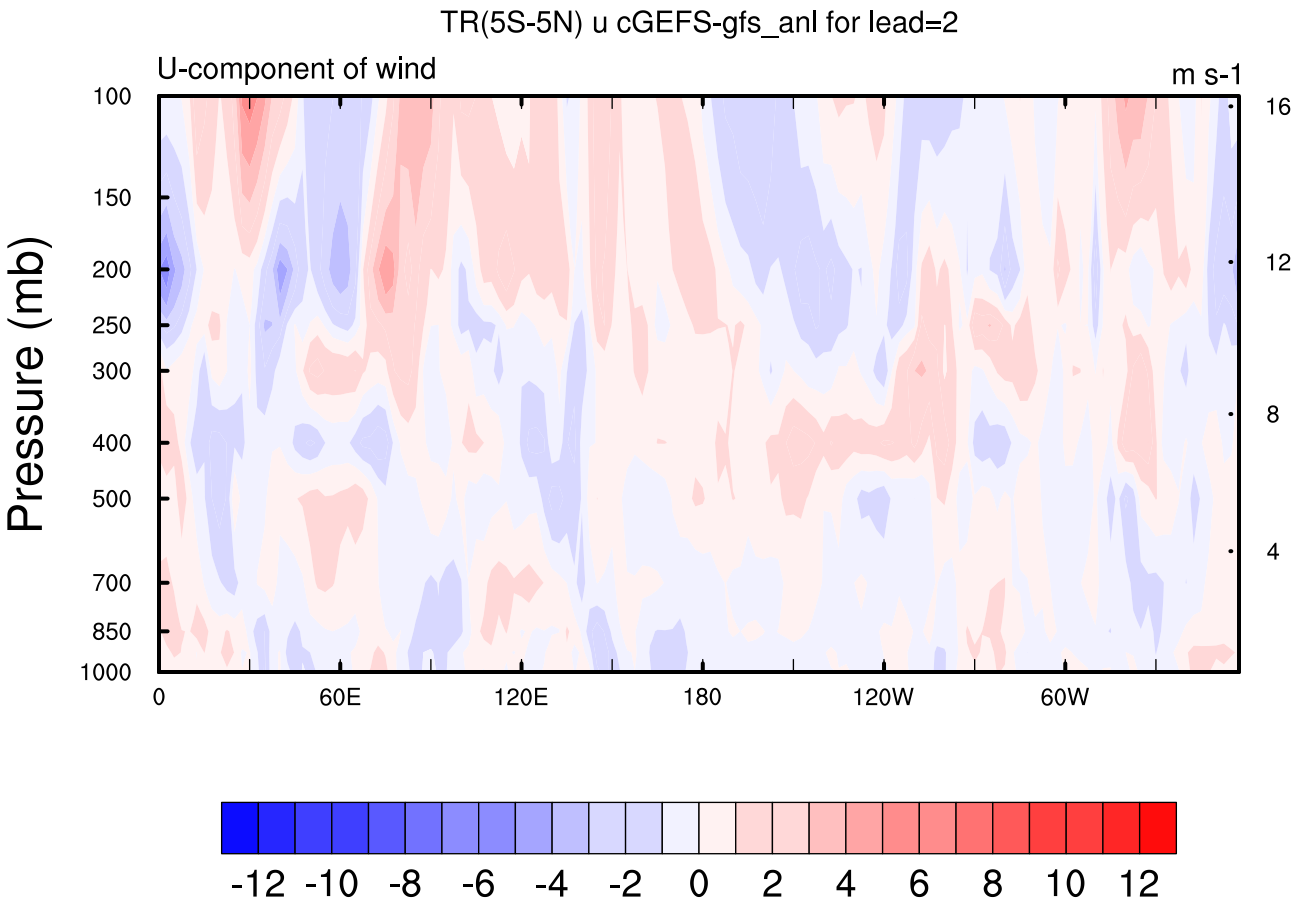

TR(5S-5N) vp cGEFS-gfs_anl for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst-gfs_anl for lead=2
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) u anl for lead=2
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS for lead=2
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u fv3refcst for lead=2
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=2
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
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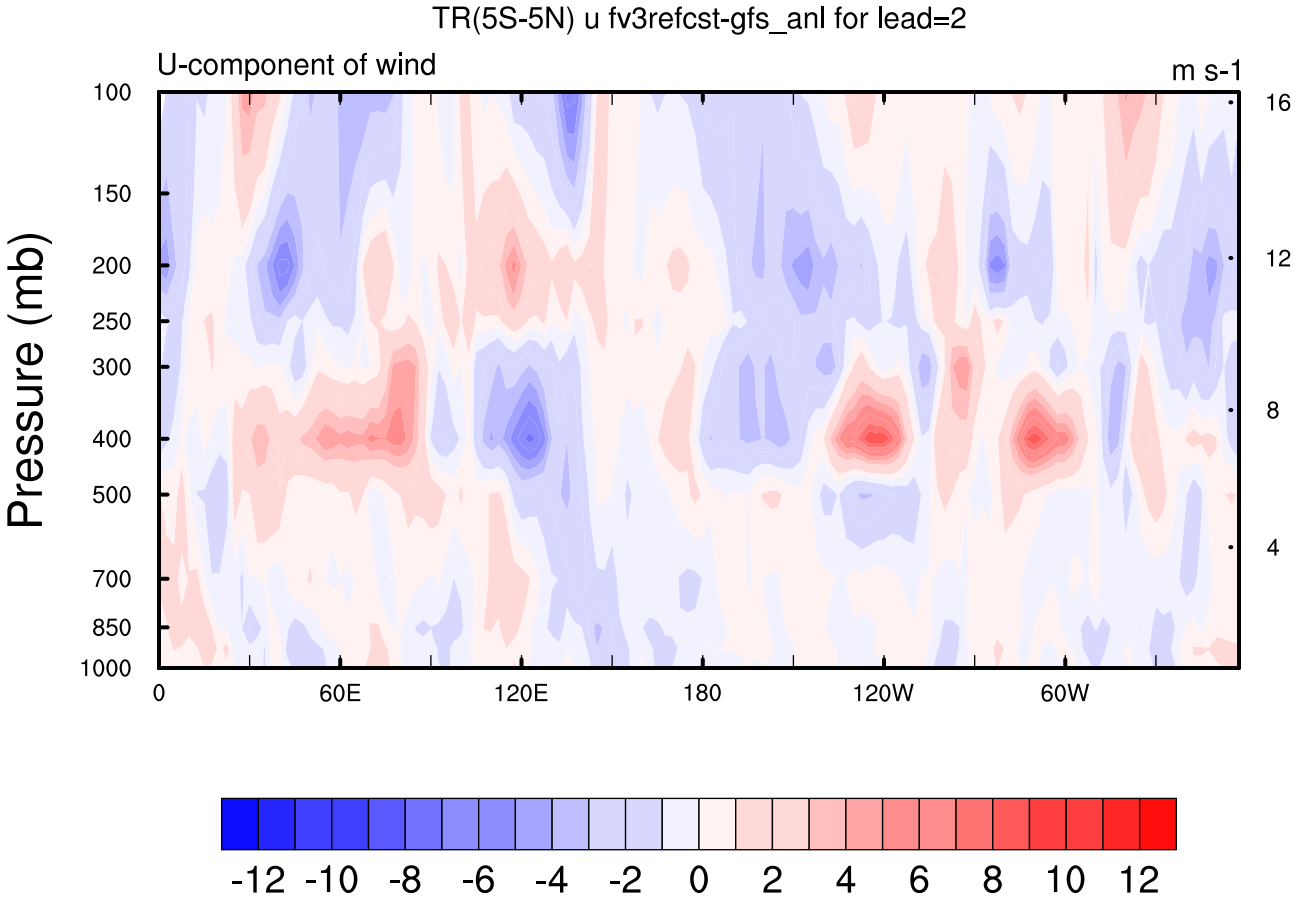
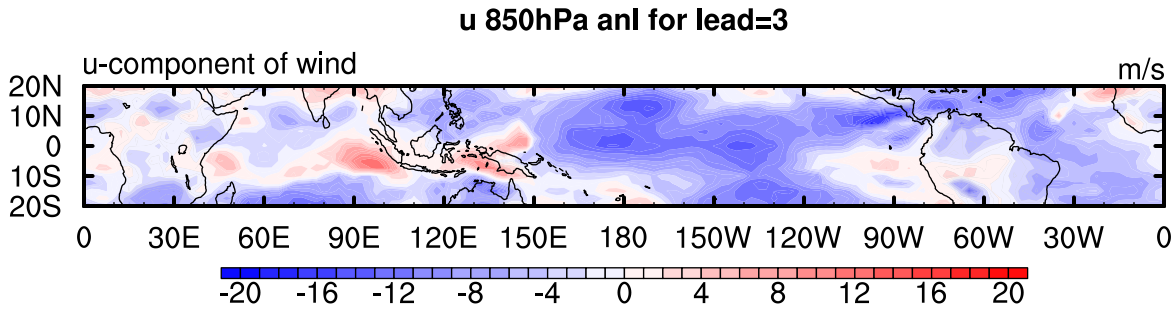
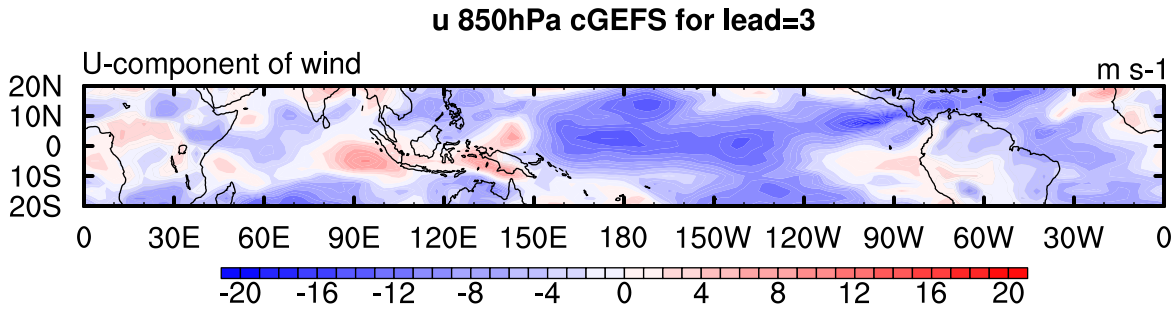
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=2
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


u 850hPa anl for lead=3
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS for lead=3
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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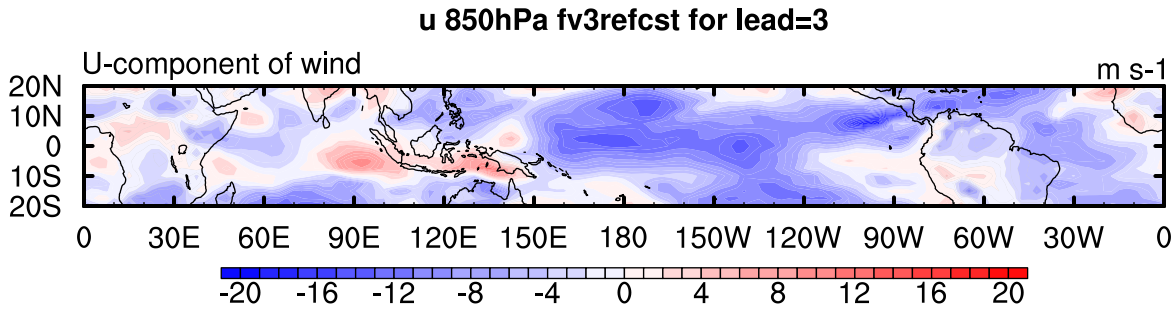
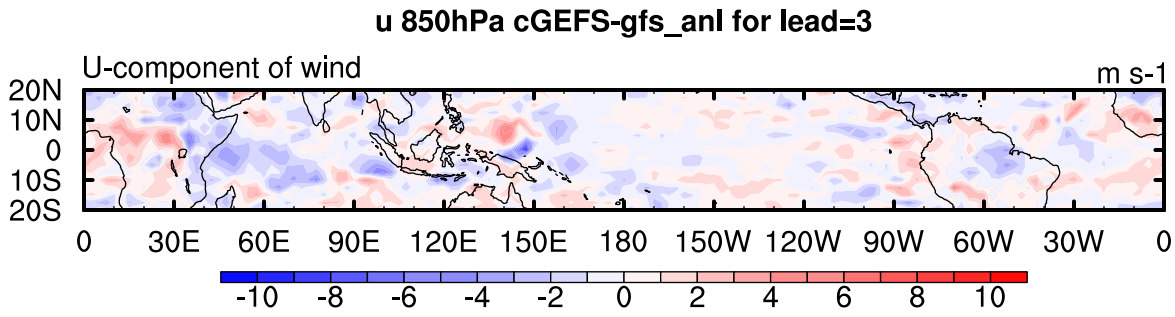
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa fv3refcst for lead=3
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=3
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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60W
30W
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-4
-2
0
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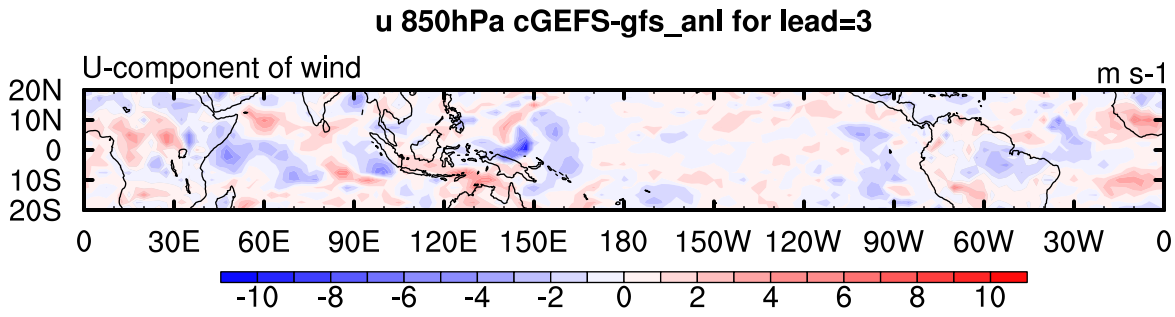
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U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-4
-2
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8
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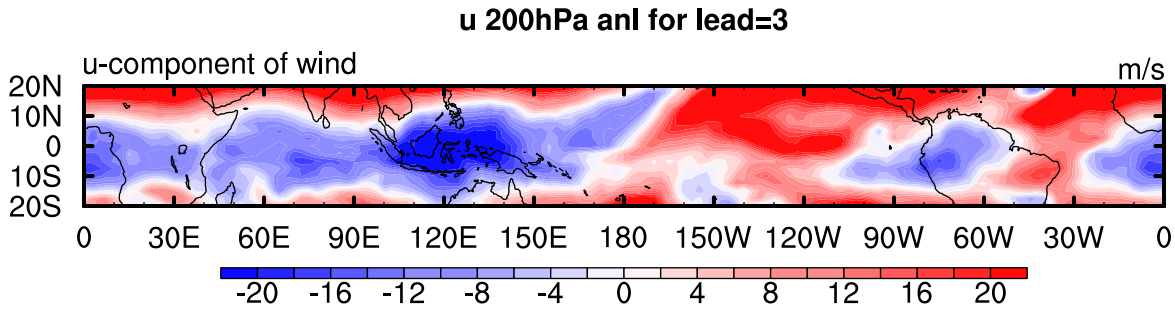
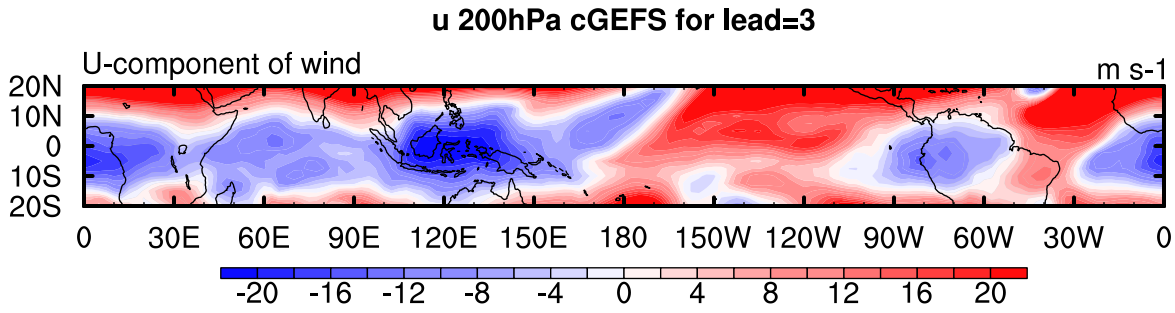

u 200hPa anl for lead=3
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=3
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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60W
30W
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-20
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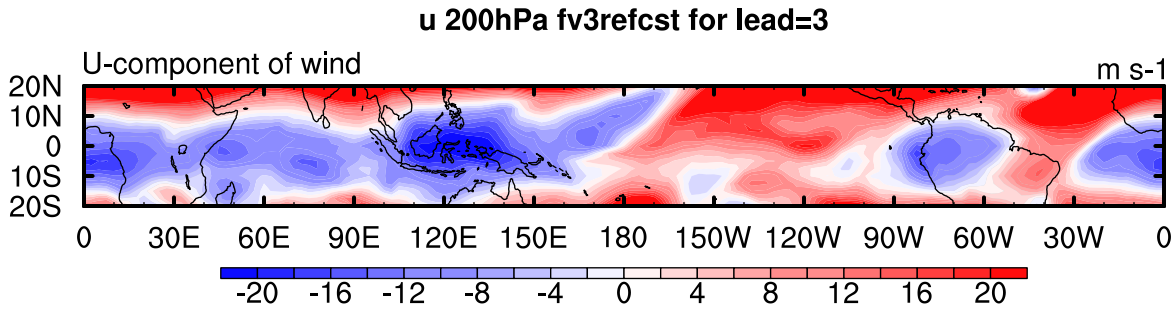
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=3
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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60W
30W
0
-20
-16
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-4
0
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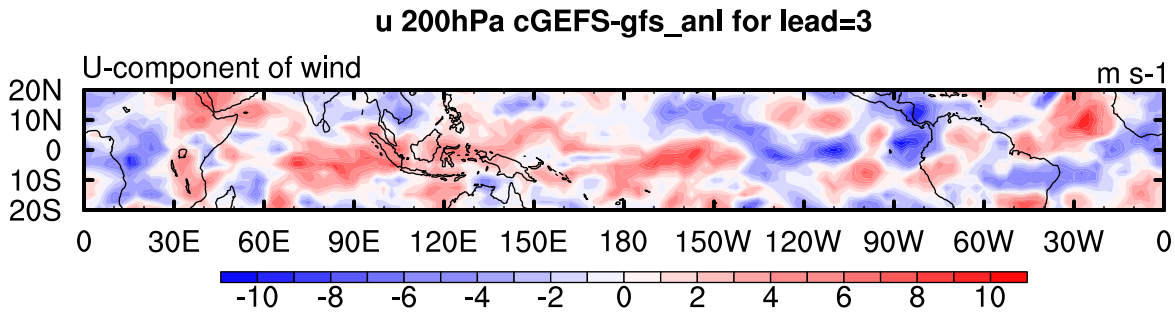
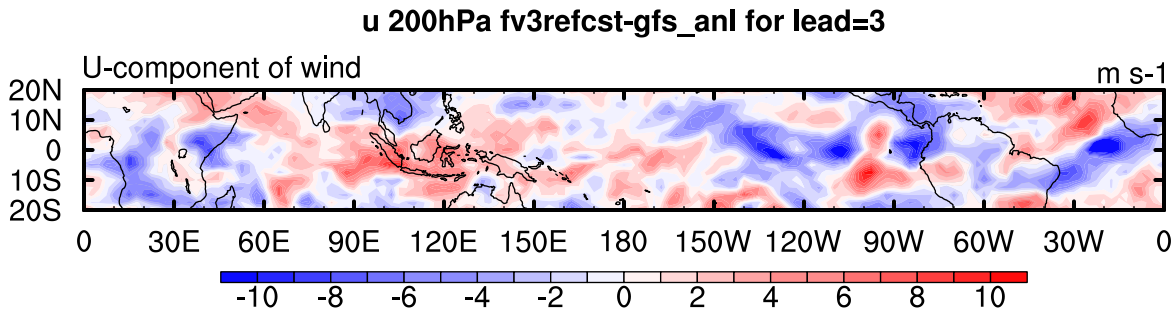
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=3
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=3
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-10
-8
-6
-4
-2
0
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4
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8
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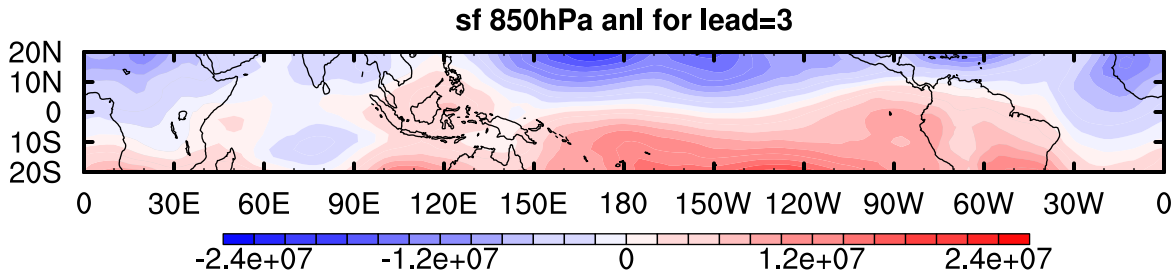
sf 850hPa anl for lead=3
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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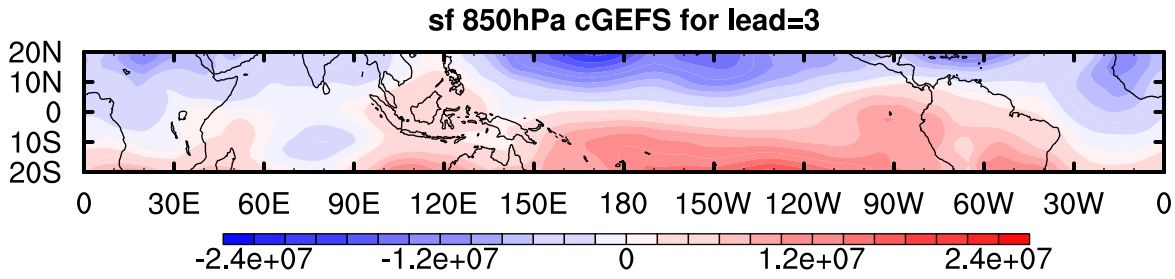
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=3
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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120W
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60W
30W
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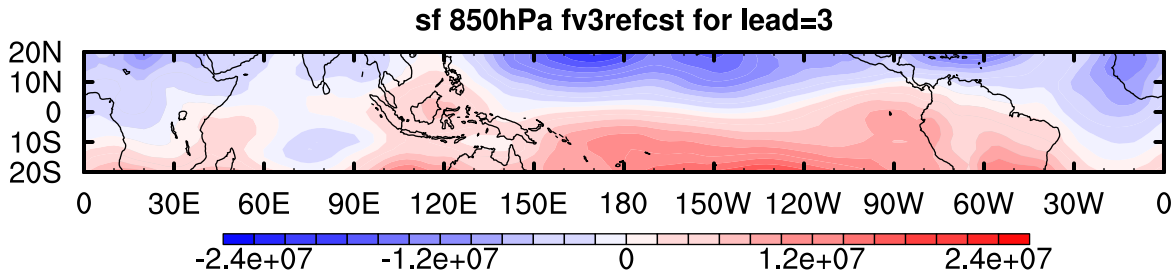
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=3
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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60W
30W
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-2.4e+07
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0
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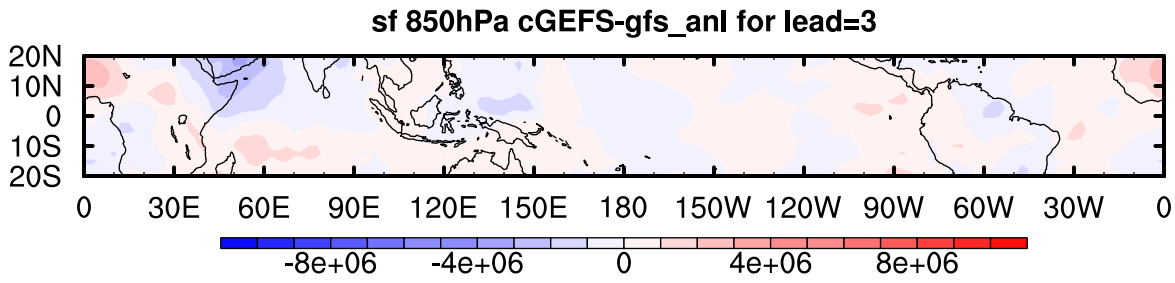
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=3
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10N
0
10S
20S
0
30E
60E
90E
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30W
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-4e+06
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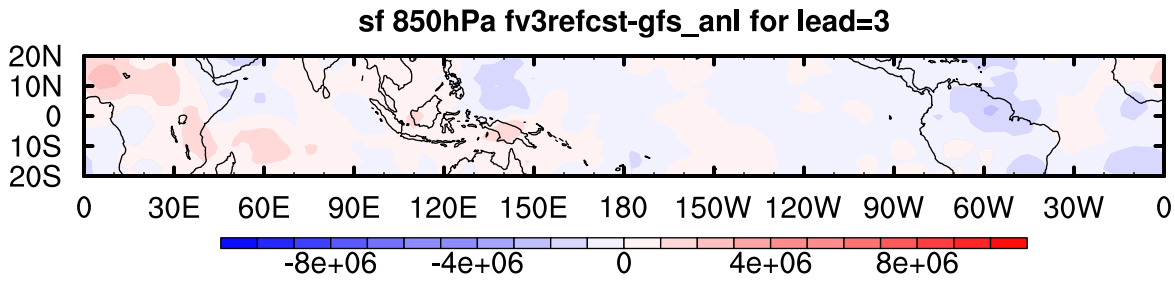
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=3
20N
10N
0
10S
20S
0
30E
60E
90E
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120W
90W
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30W
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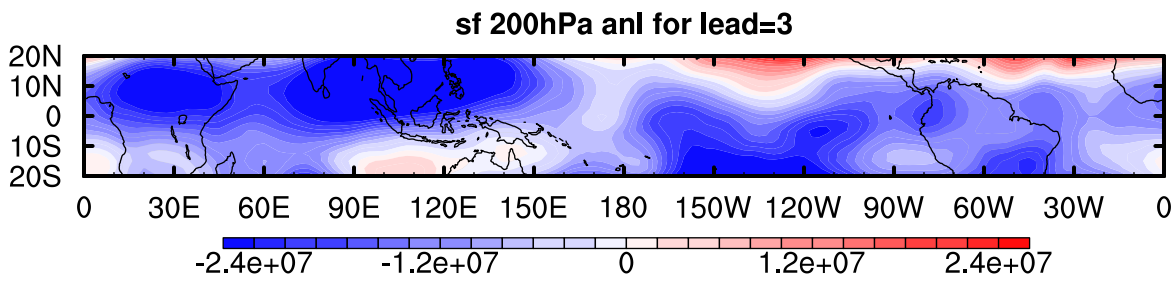
-4e+06
0
4e+06
8e+06


sf 200hPa anl for lead=3
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10N
0
10S
20S
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30E
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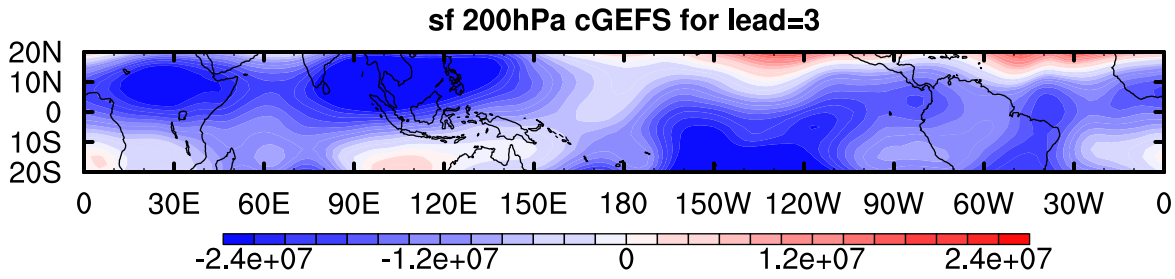
sf 200hPa cGEFS for lead=3
20N
10N
0
10S
20S
0
30E
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90E
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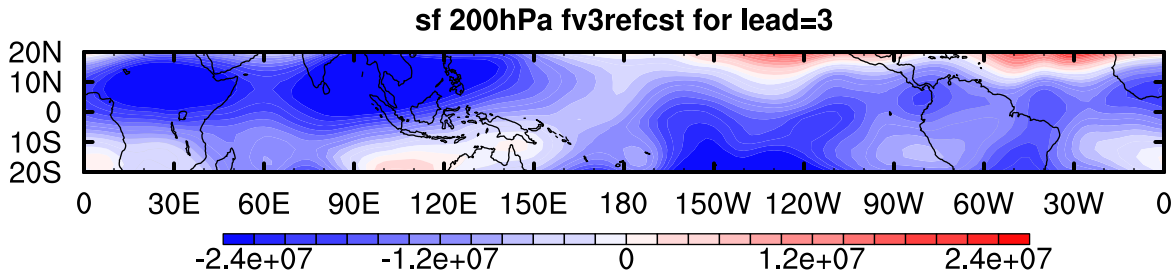
sf 200hPa fv3refcst for lead=3
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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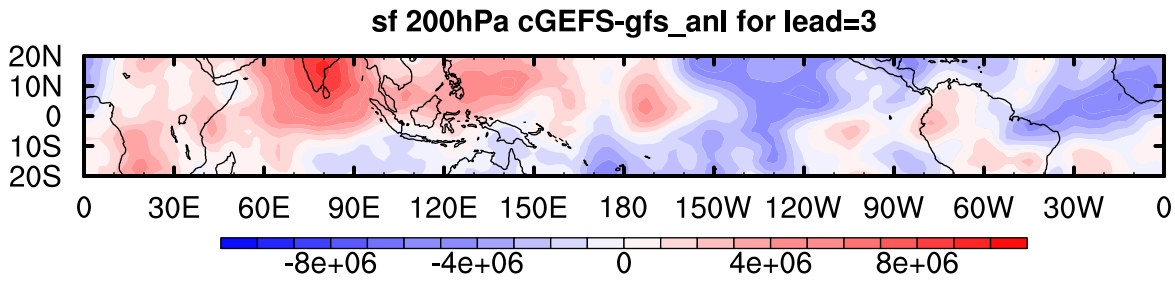
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=3
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10N
0
10S
20S
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90E
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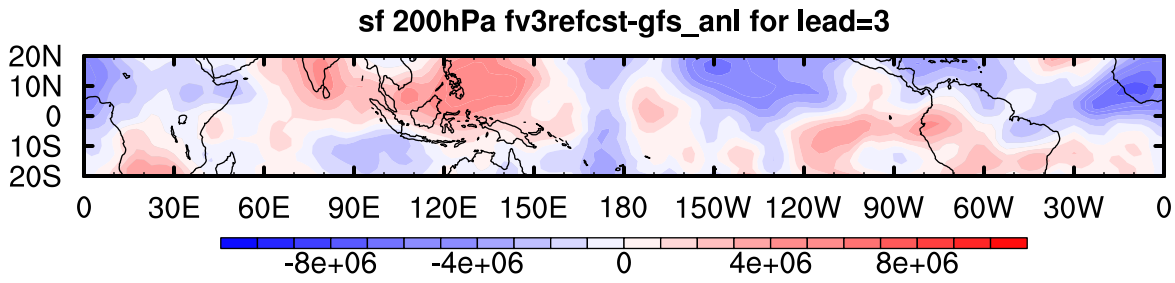
sf 200hPa fv3refcst-gfs_anl for lead=3
20N
10N
0
10S
20S
0
30E
60E
90E
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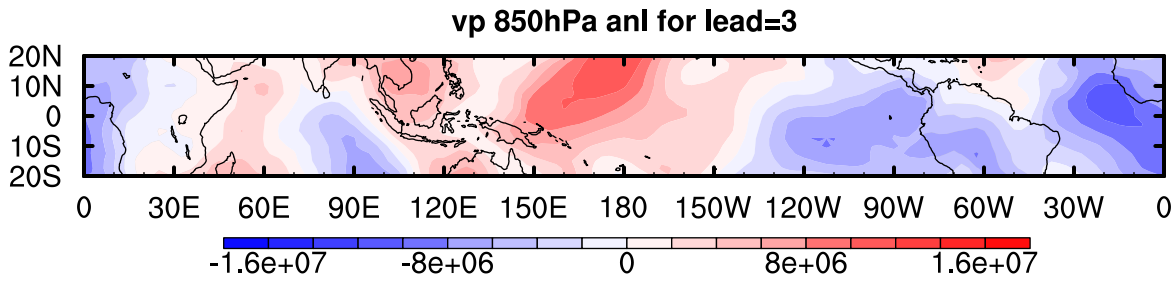
vp 850hPa anl for lead=3
20N
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10S
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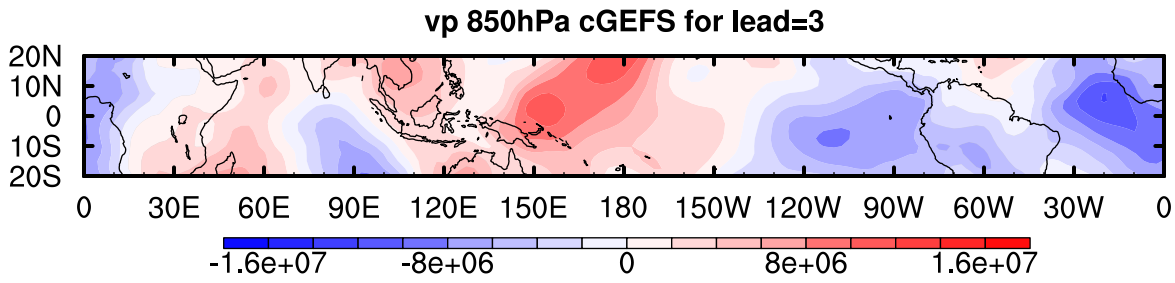
vp 850hPa cGEFS for lead=3
20N
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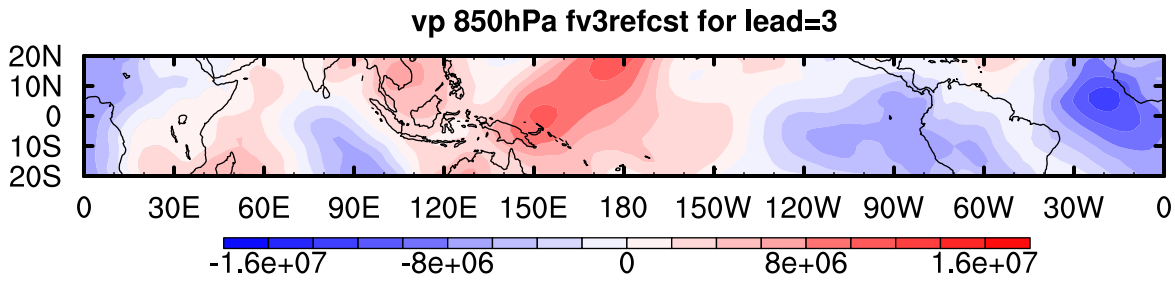
vp 850hPa fv3refcst for lead=3
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30W
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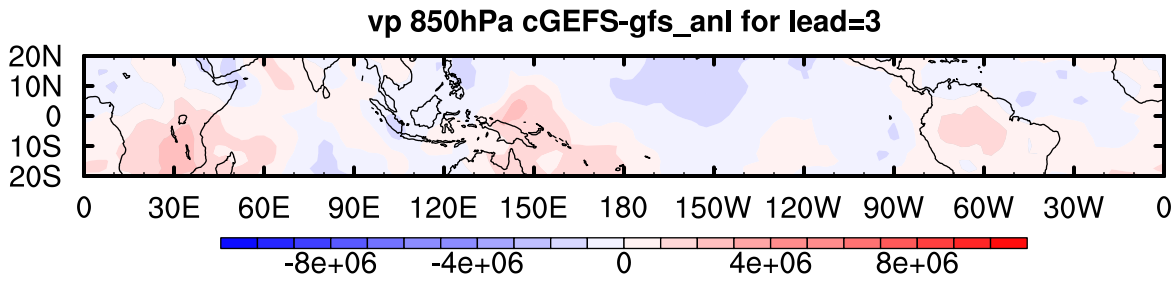
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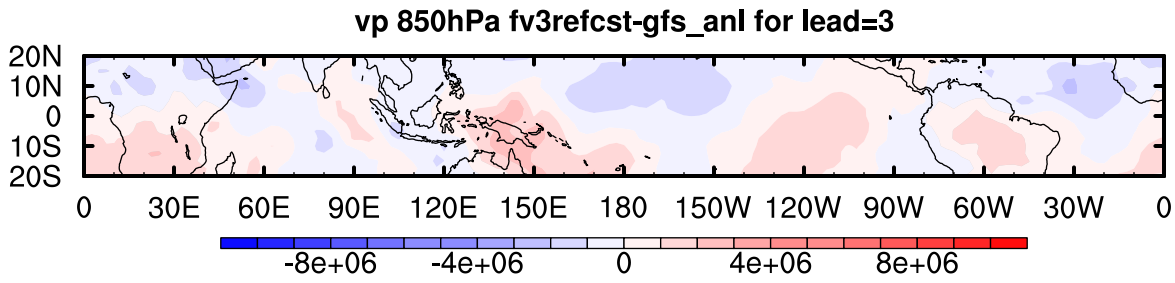
vp 850hPa fv3refcst-gfs_anl for lead=3
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30W
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-4e+06
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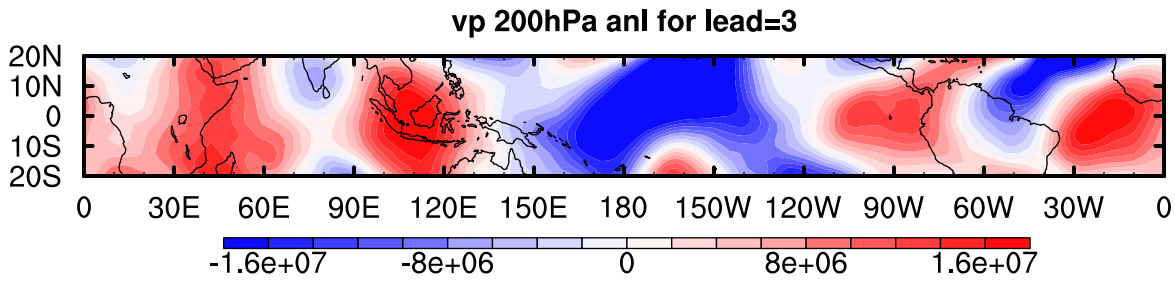
8e+06


vp 200hPa anl for lead=3
20N
10N
0
10S
20S
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30E
60E
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120E
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-1.6e+07
-8e+06
0
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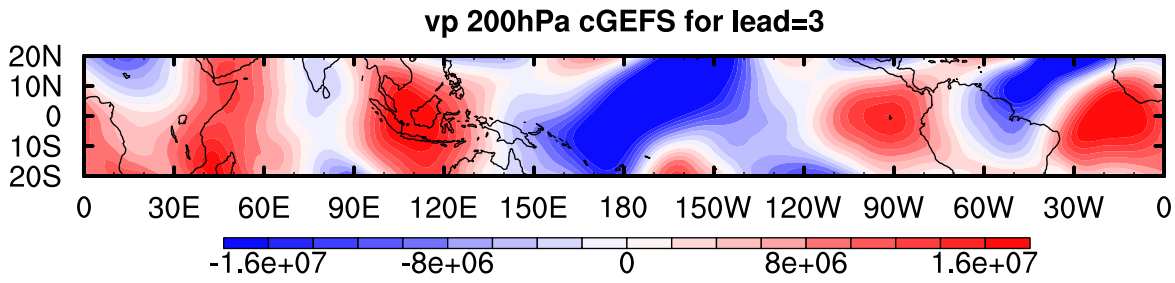
1.6e+07


vp 200hPa cGEFS for lead=3
20N
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10S
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30E
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120E
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-8e+06
0
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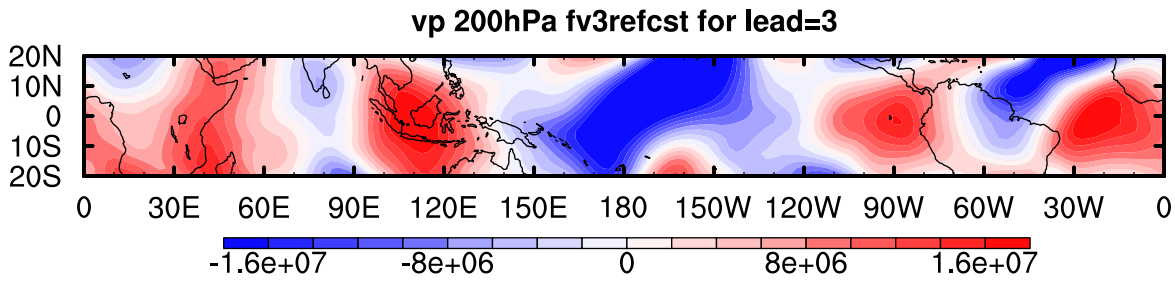
1.6e+07


vp 200hPa fv3refcst for lead=3
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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0
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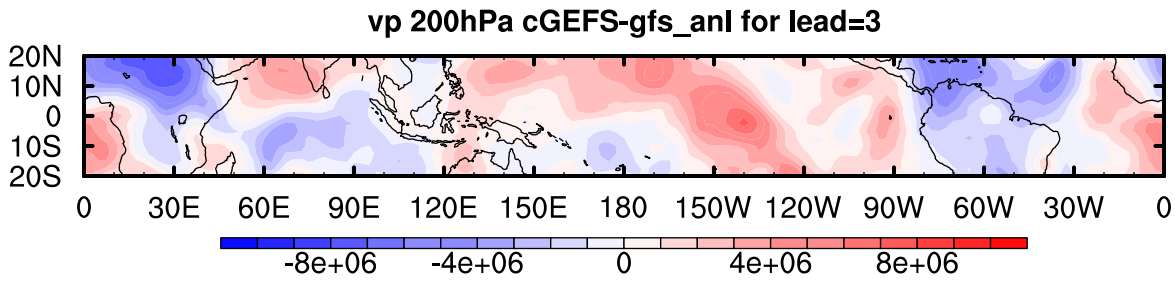
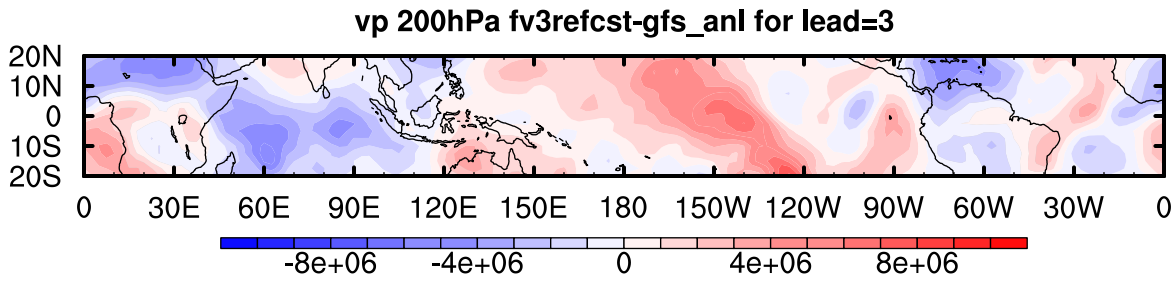
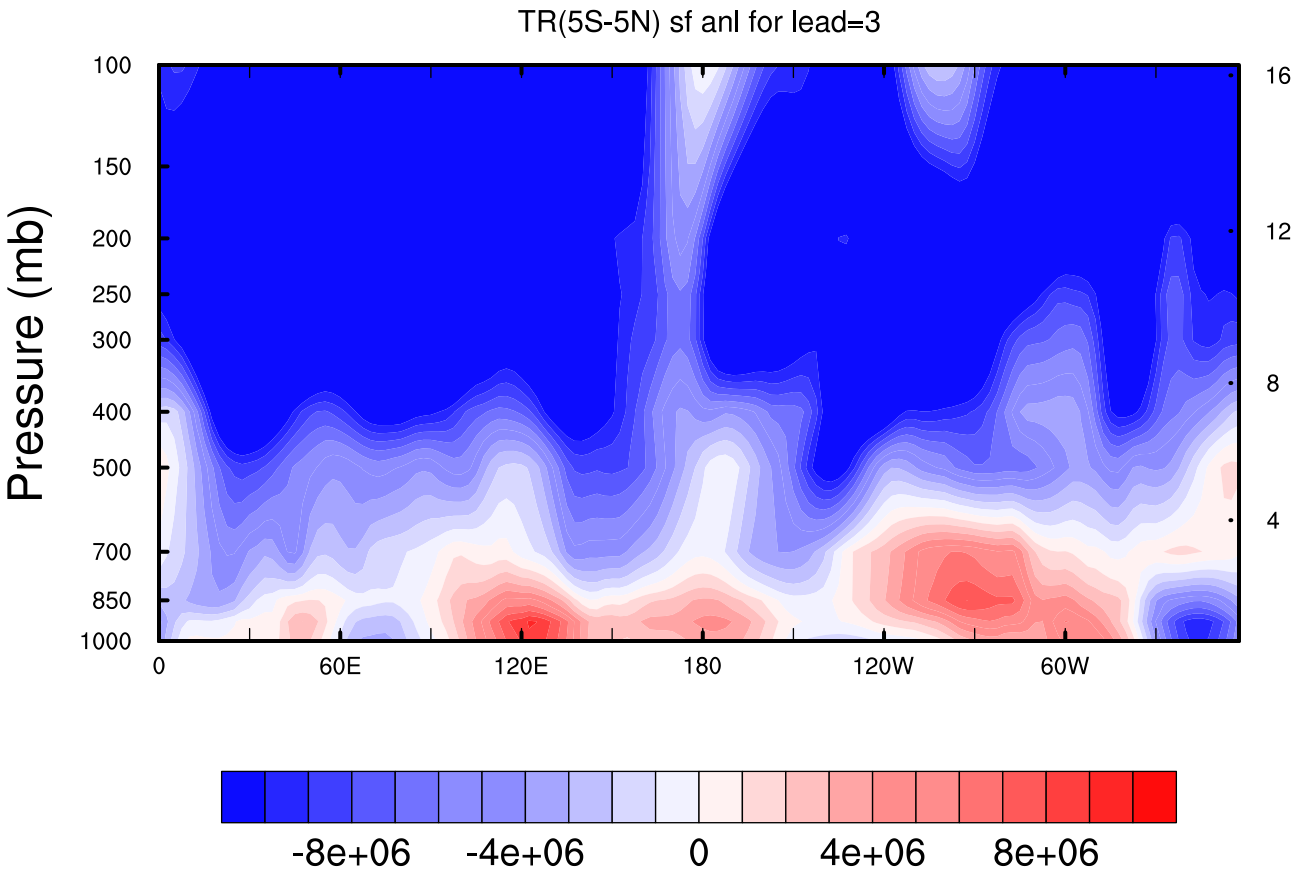
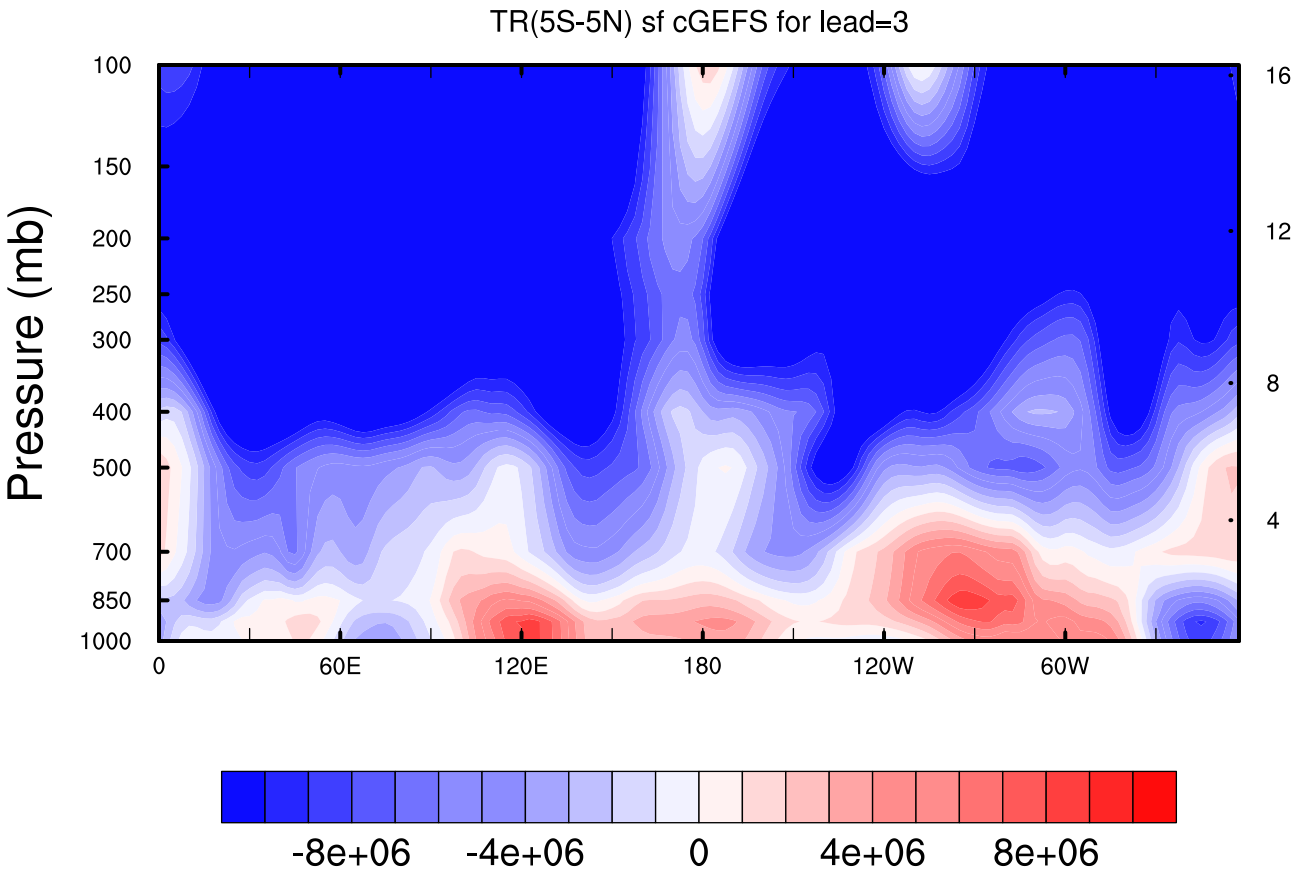
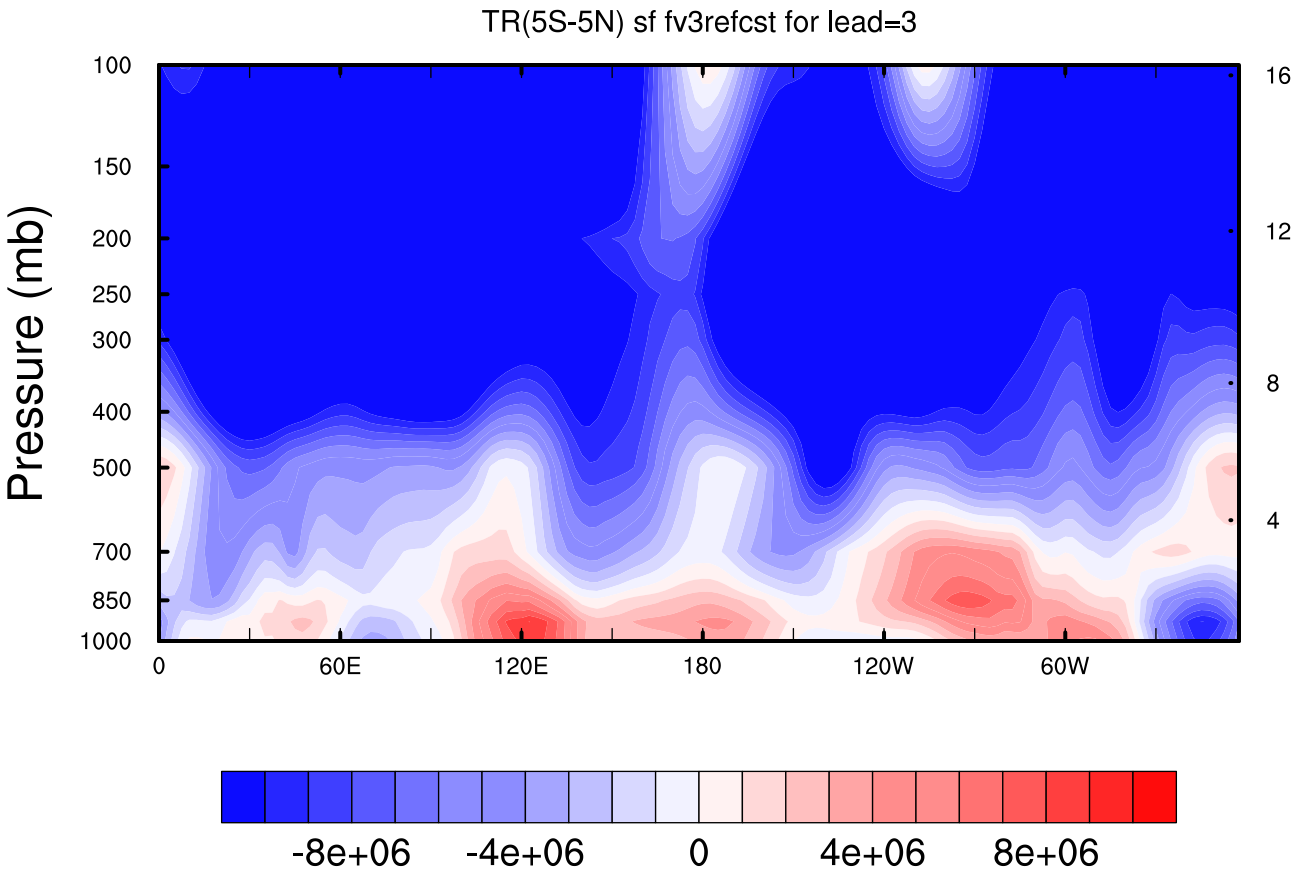
1.6e+07

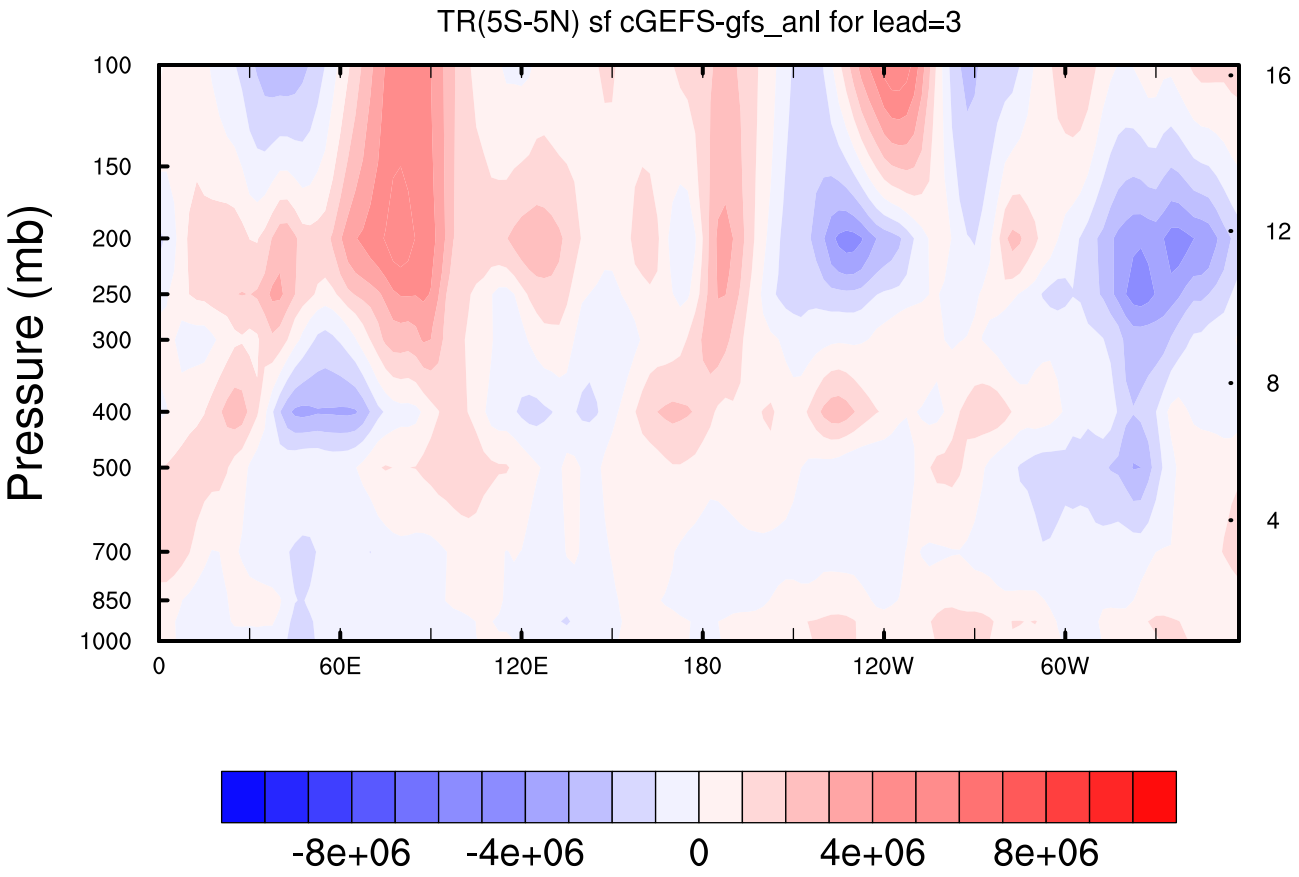

vp 200hPa cGEFS-gfs_anl for lead=3
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

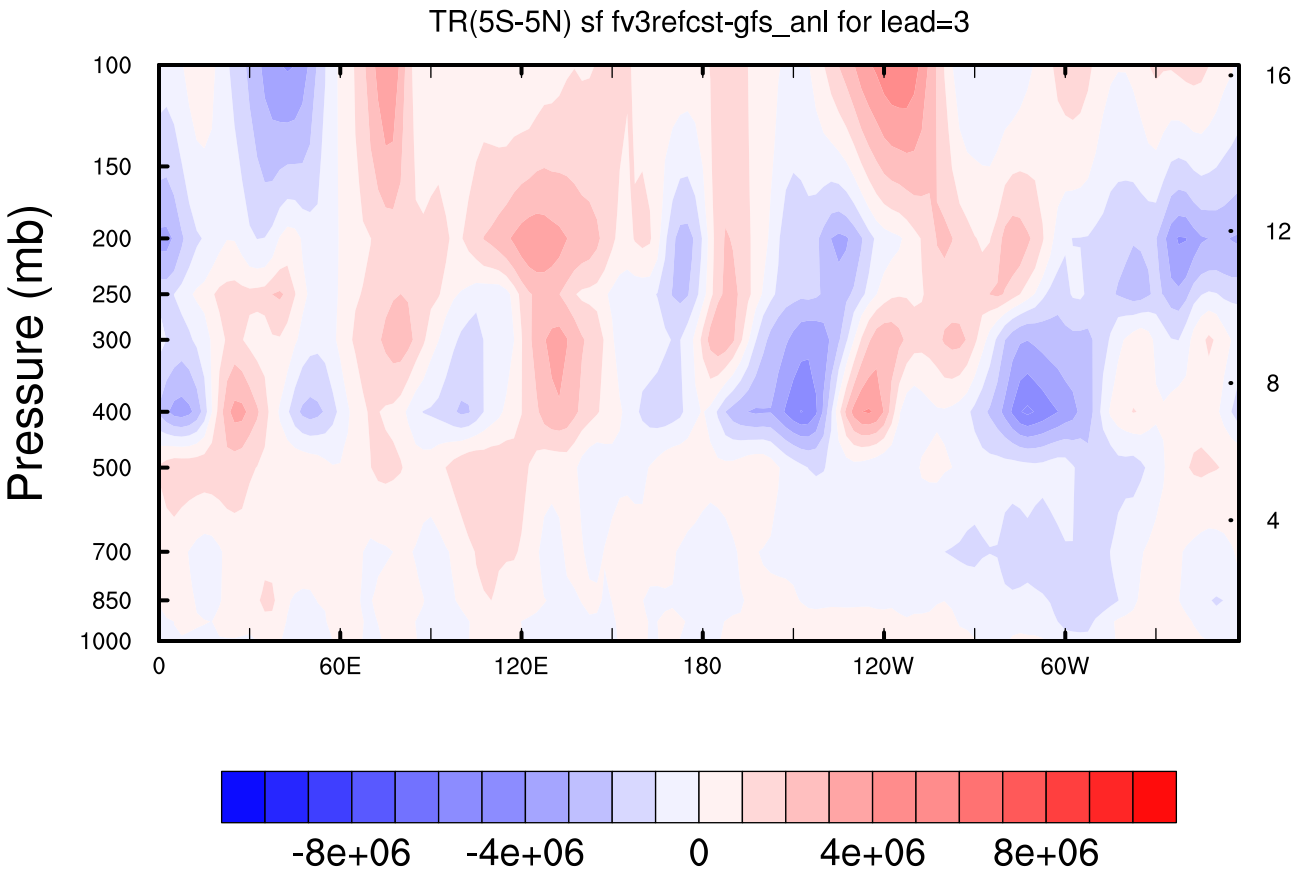

vp 200hPa fv3refcst-gfs_anl for lead=3
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

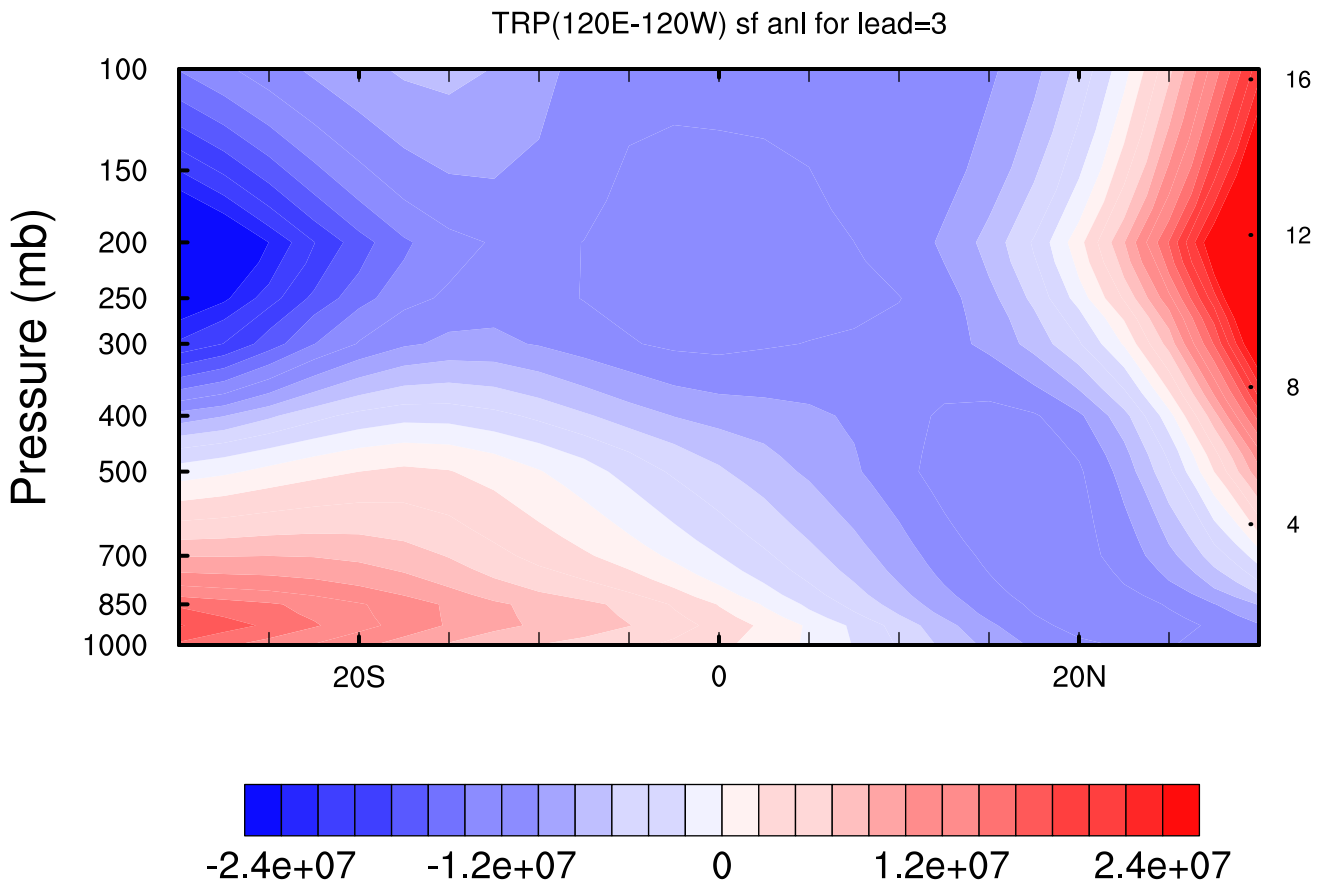

TR(5S-5N) sf anl for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

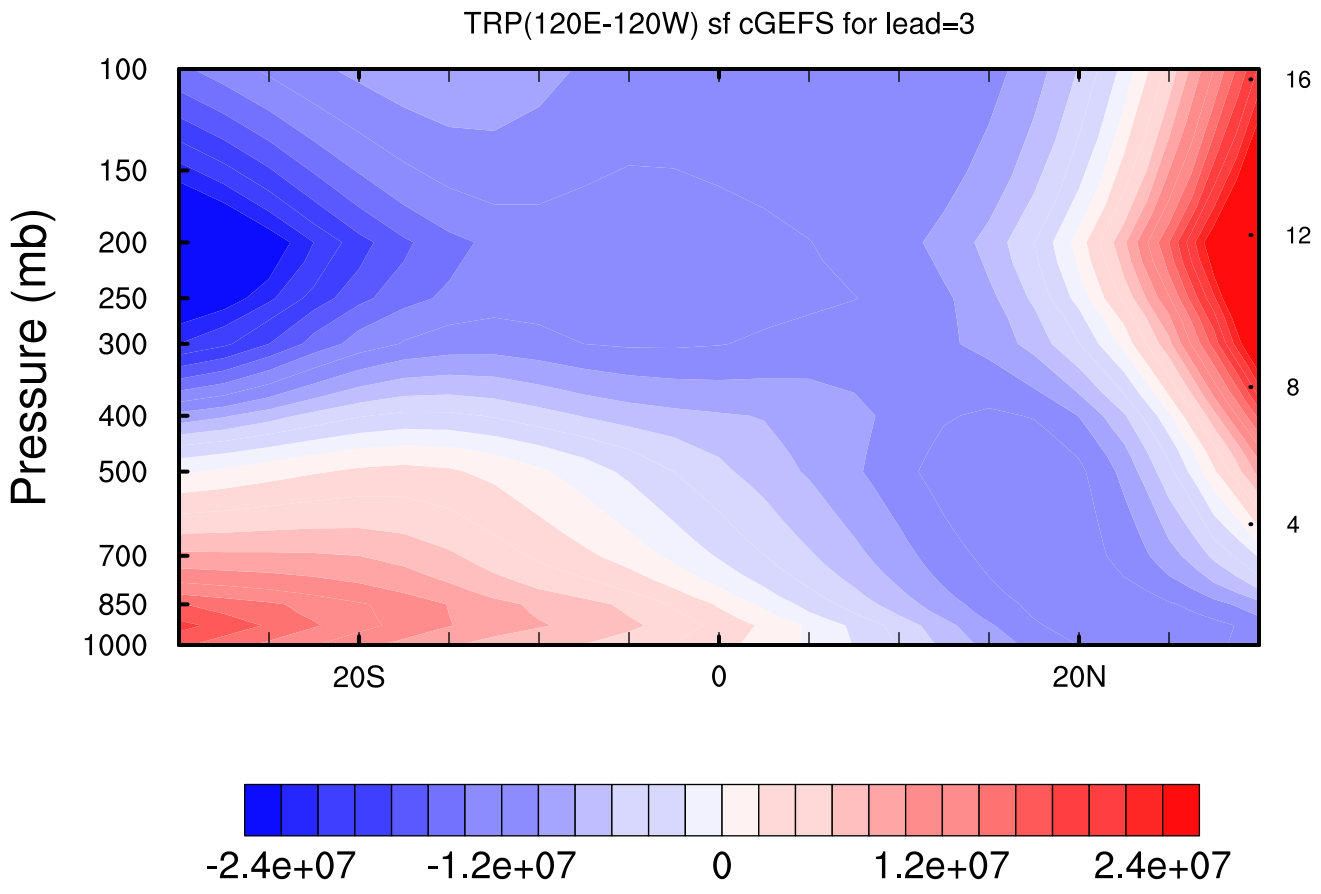

TR(5S-5N) sf cGEFS for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

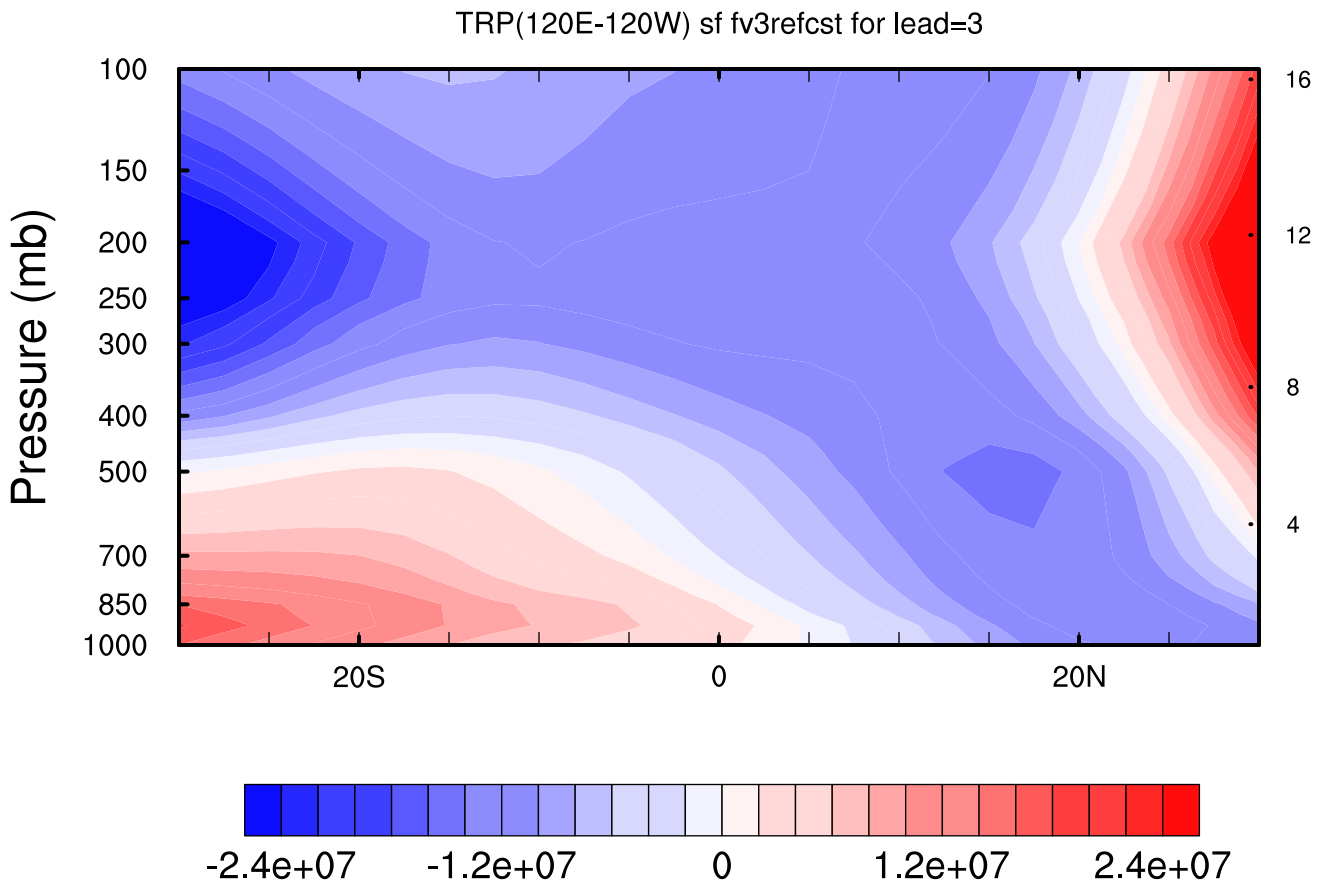

TR(5S-5N) sf fv3refcst for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

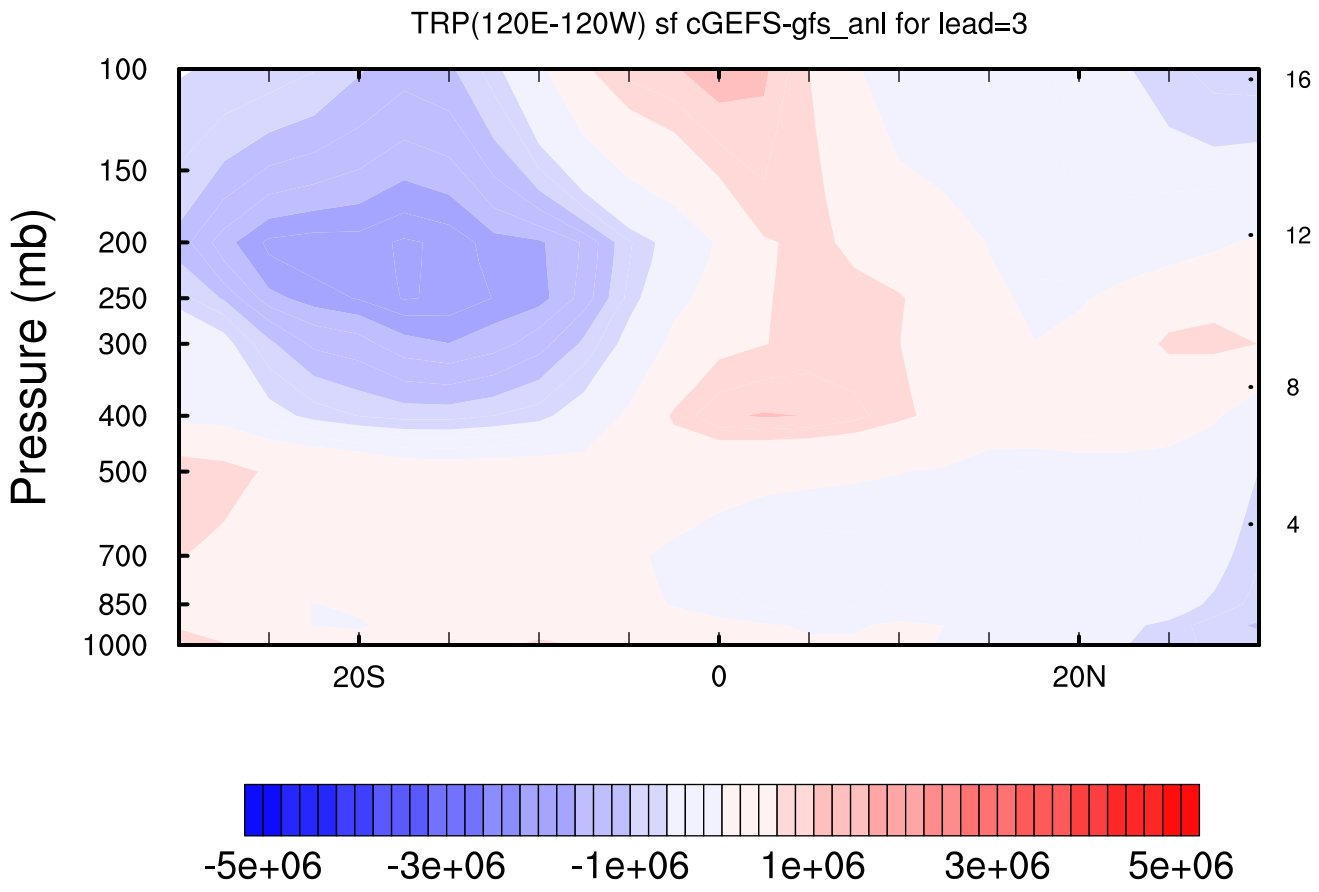

TR(5S-5N) sf cGEFS-gfs_anl for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

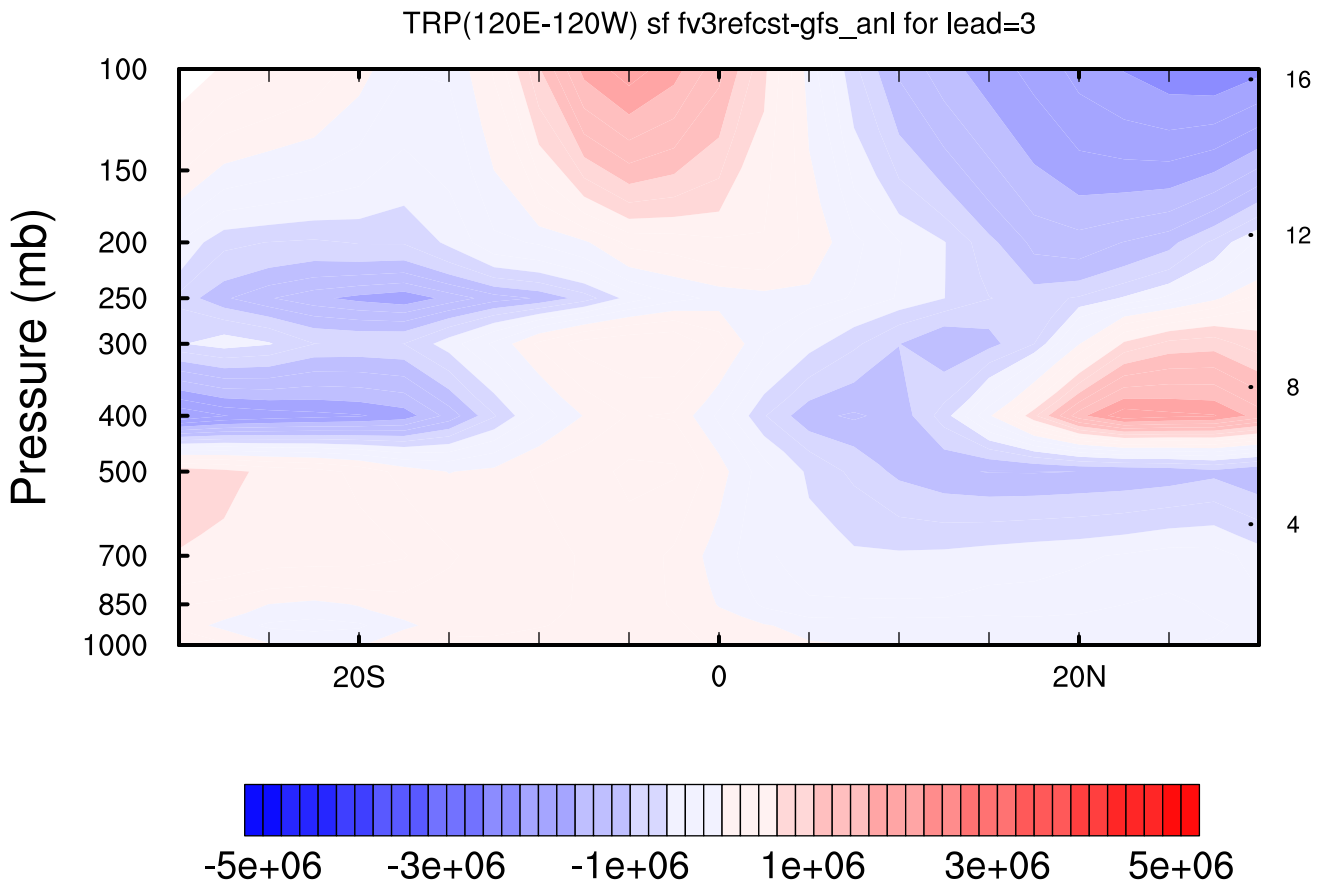

TR(5S-5N) sf fv3refcst-gfs_anl for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

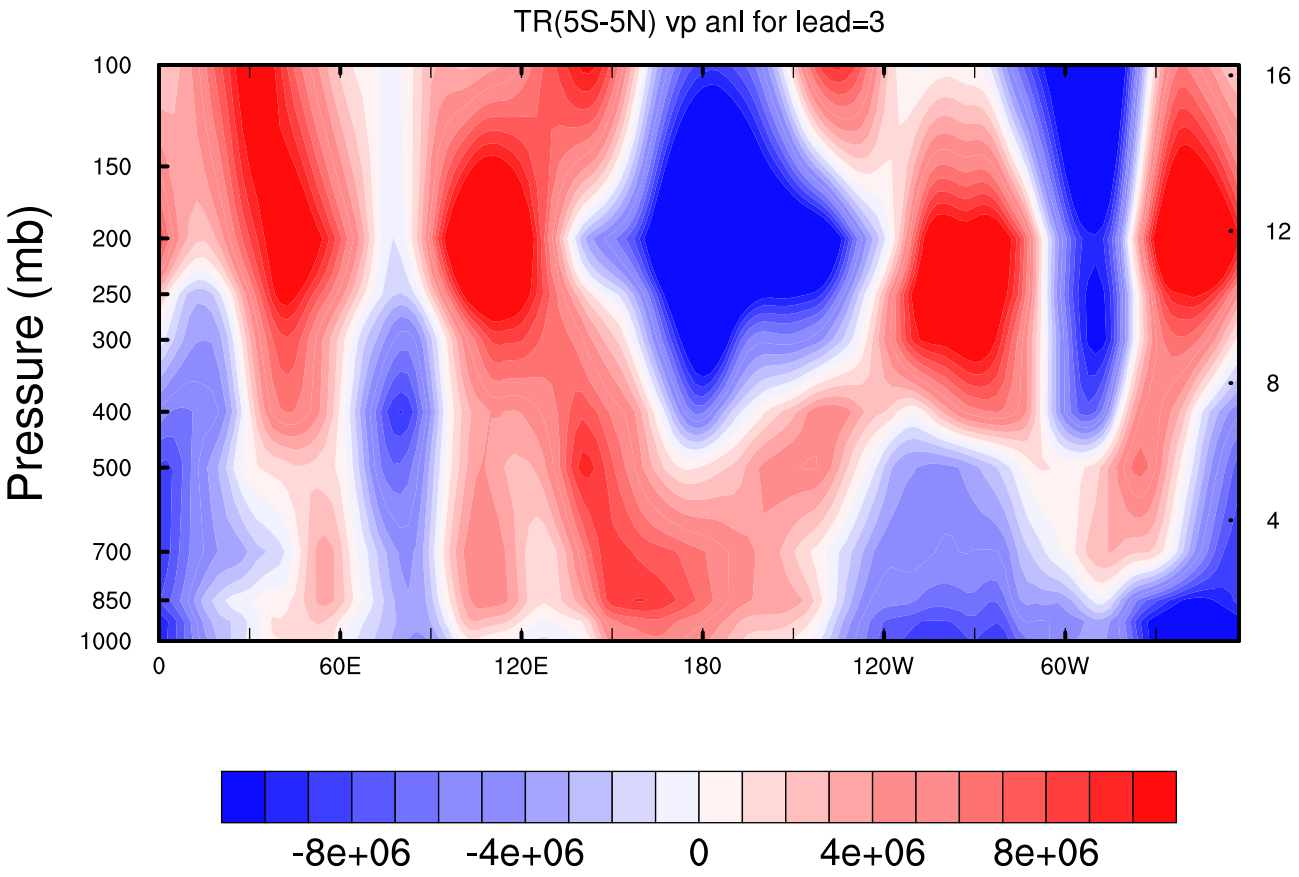

TRP(120E-120W) sf anl for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

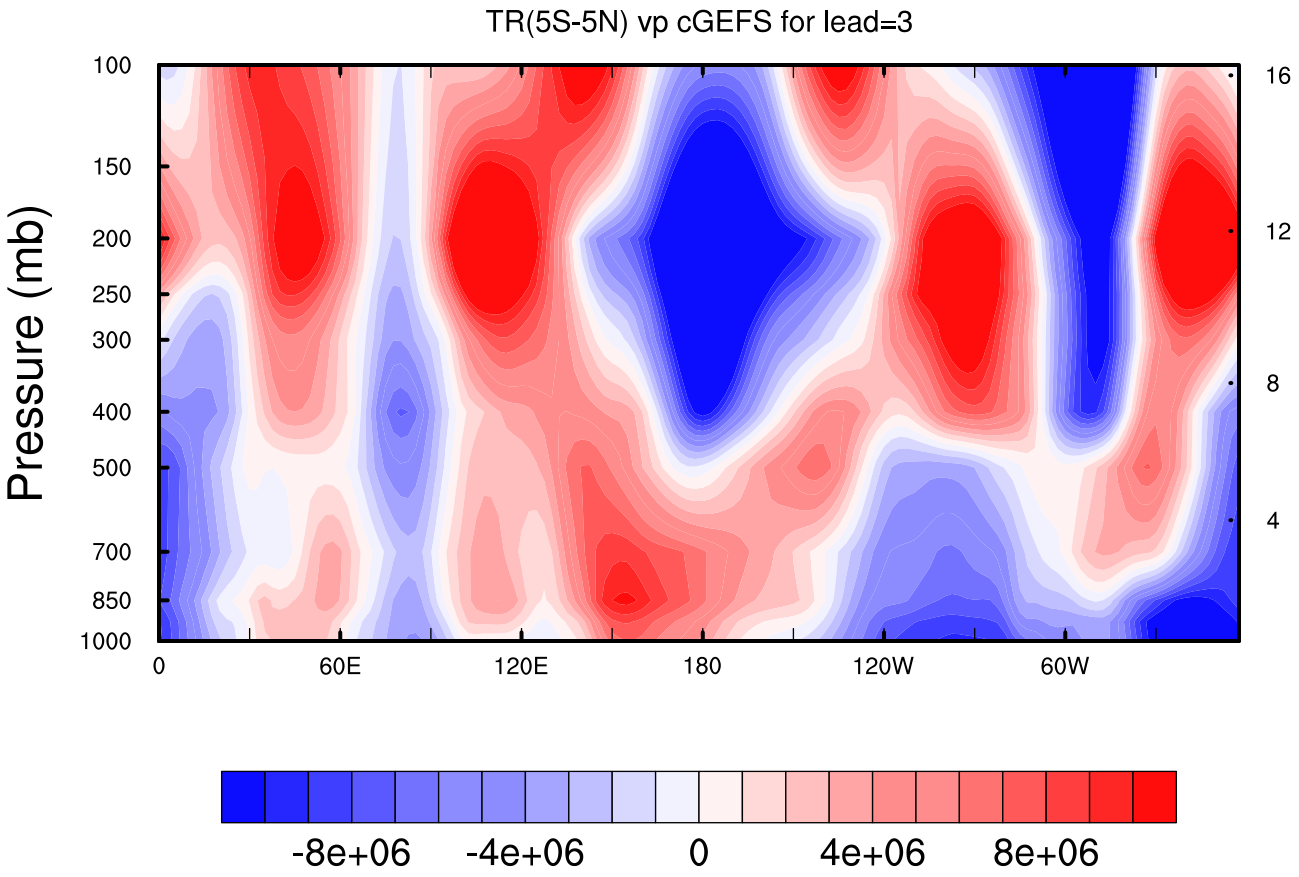

TRP(120E-120W) sf cGEFS for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

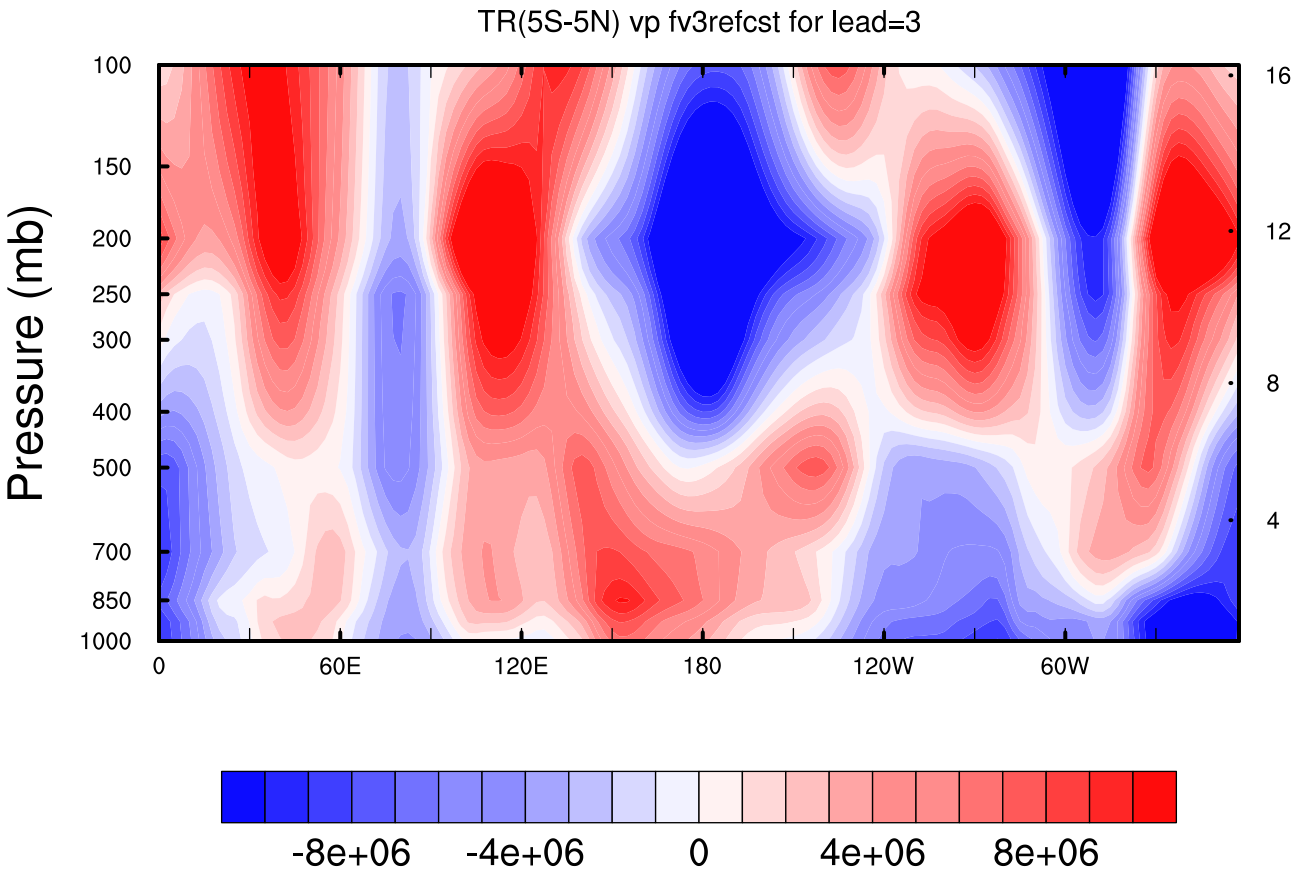

TRP(120E-120W) sf fv3refcst for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

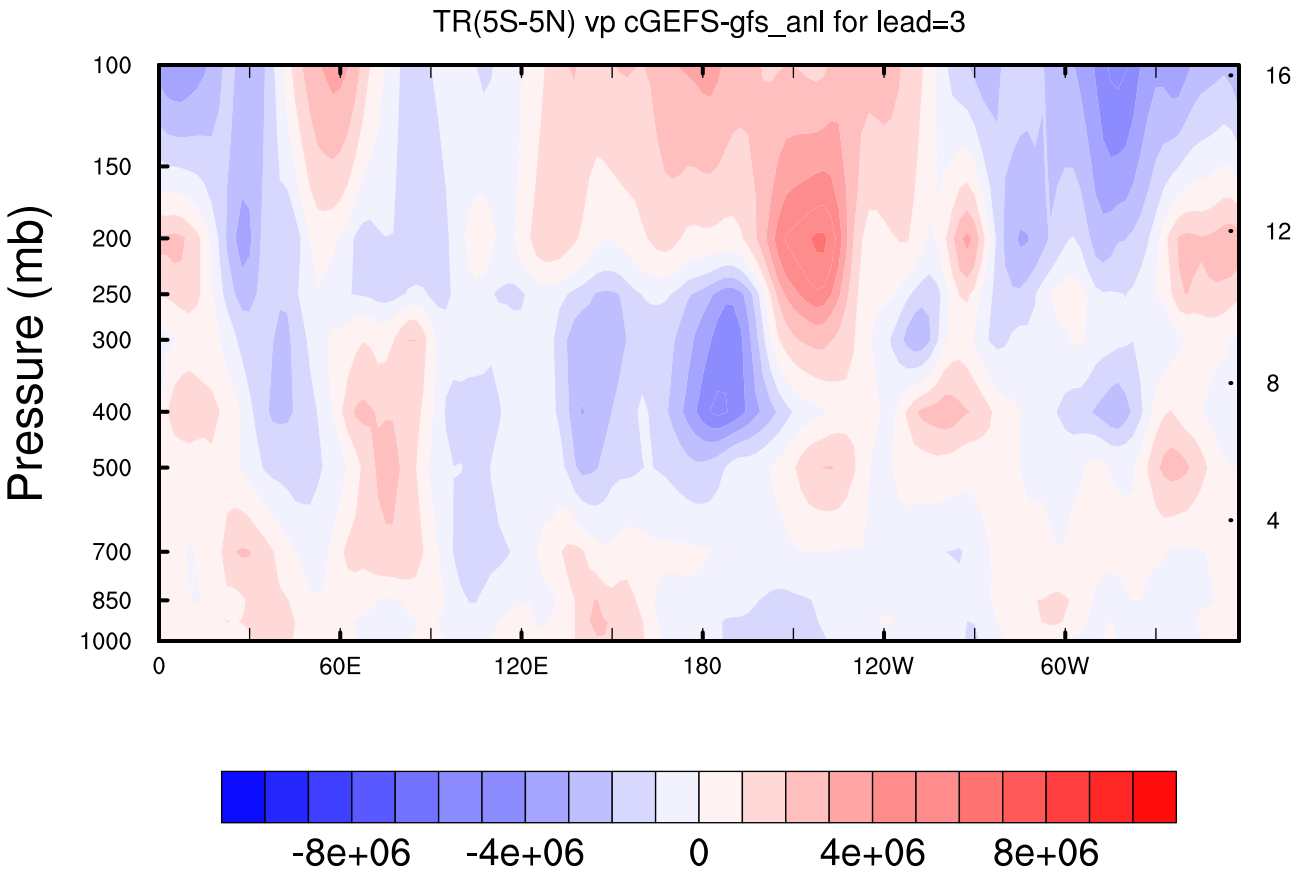

TRP(120E-120W) sf cGEFS-gfs_anl for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

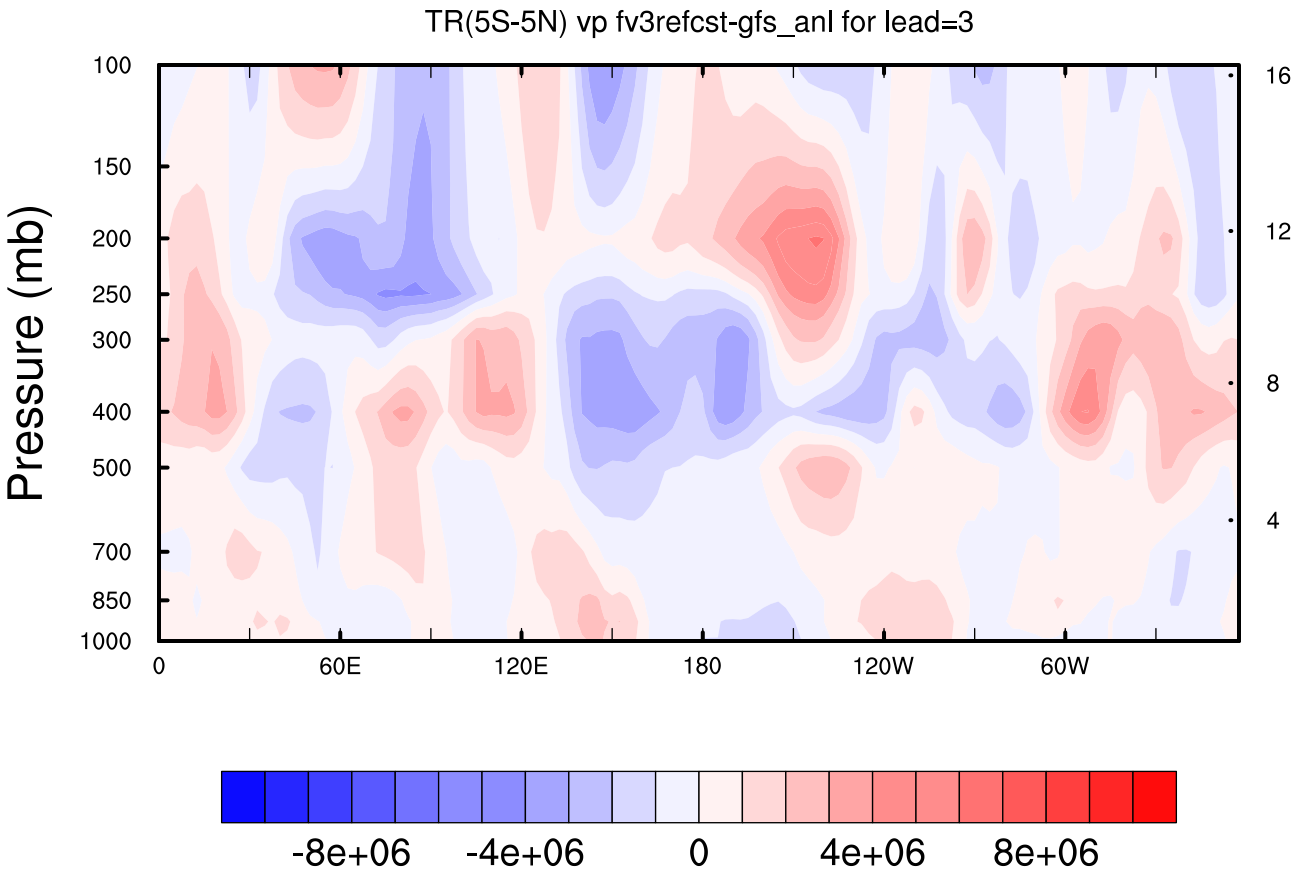

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

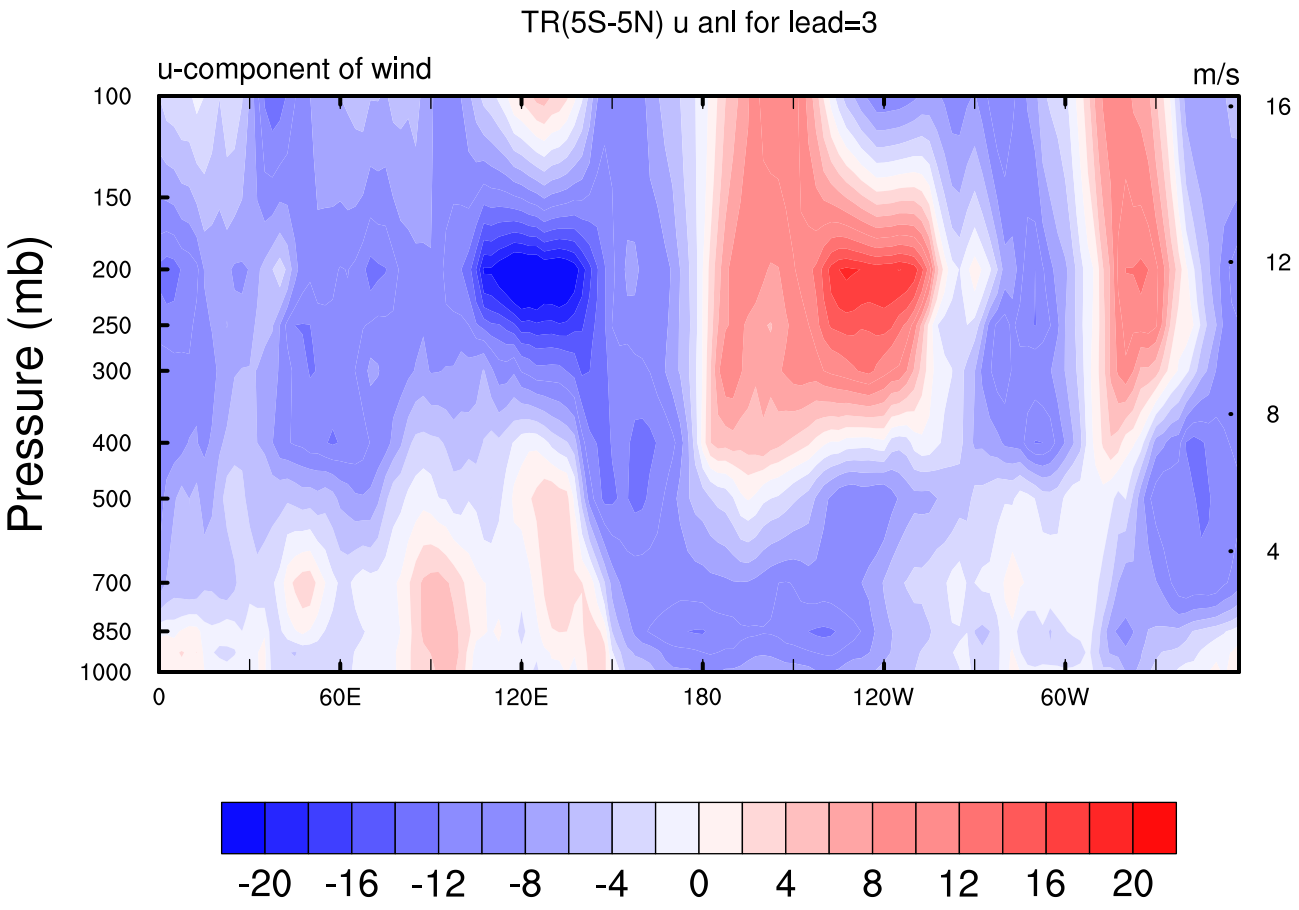

TR(5S-5N) vp anl for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

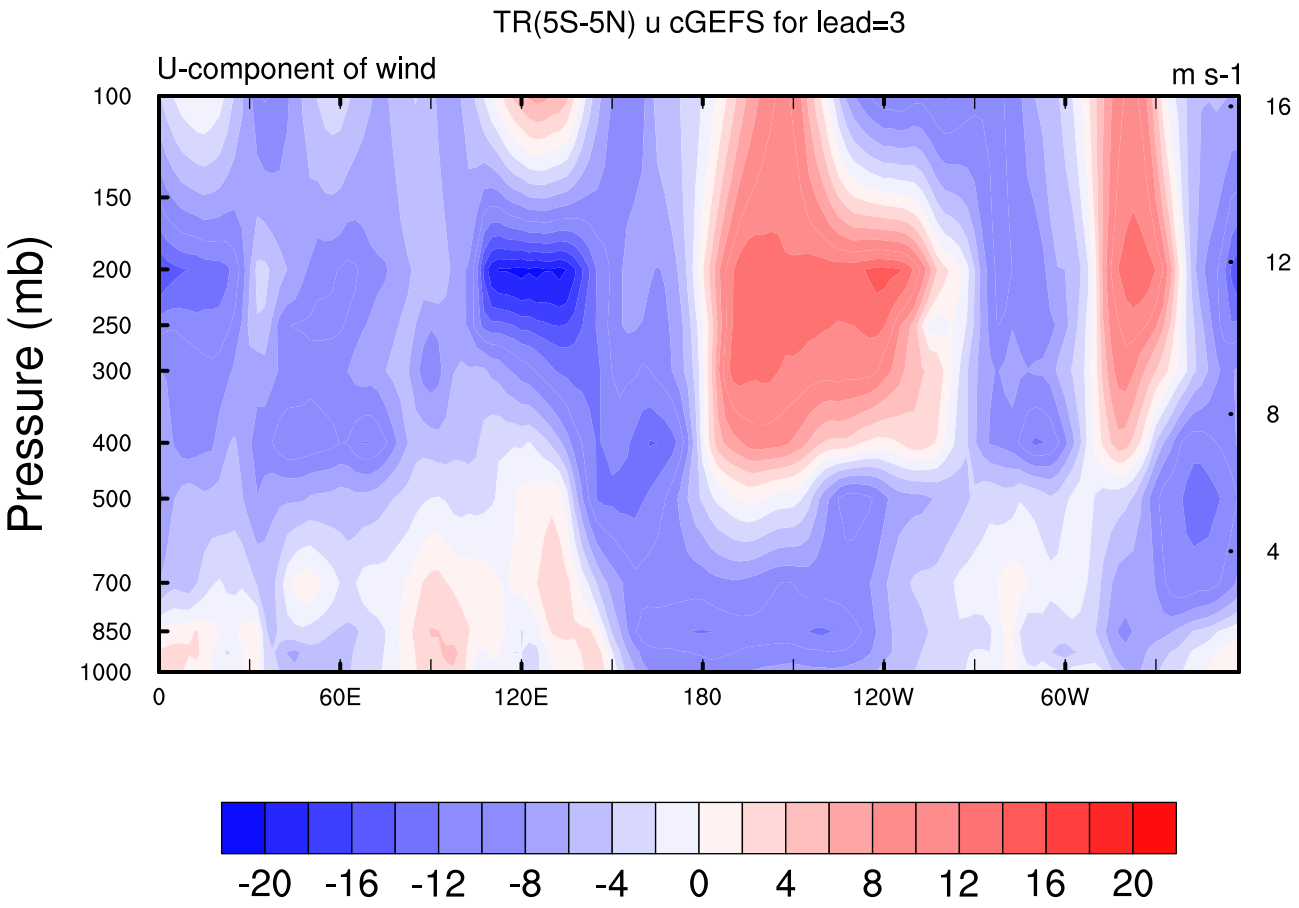

TR(5S-5N) vp cGEFS for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

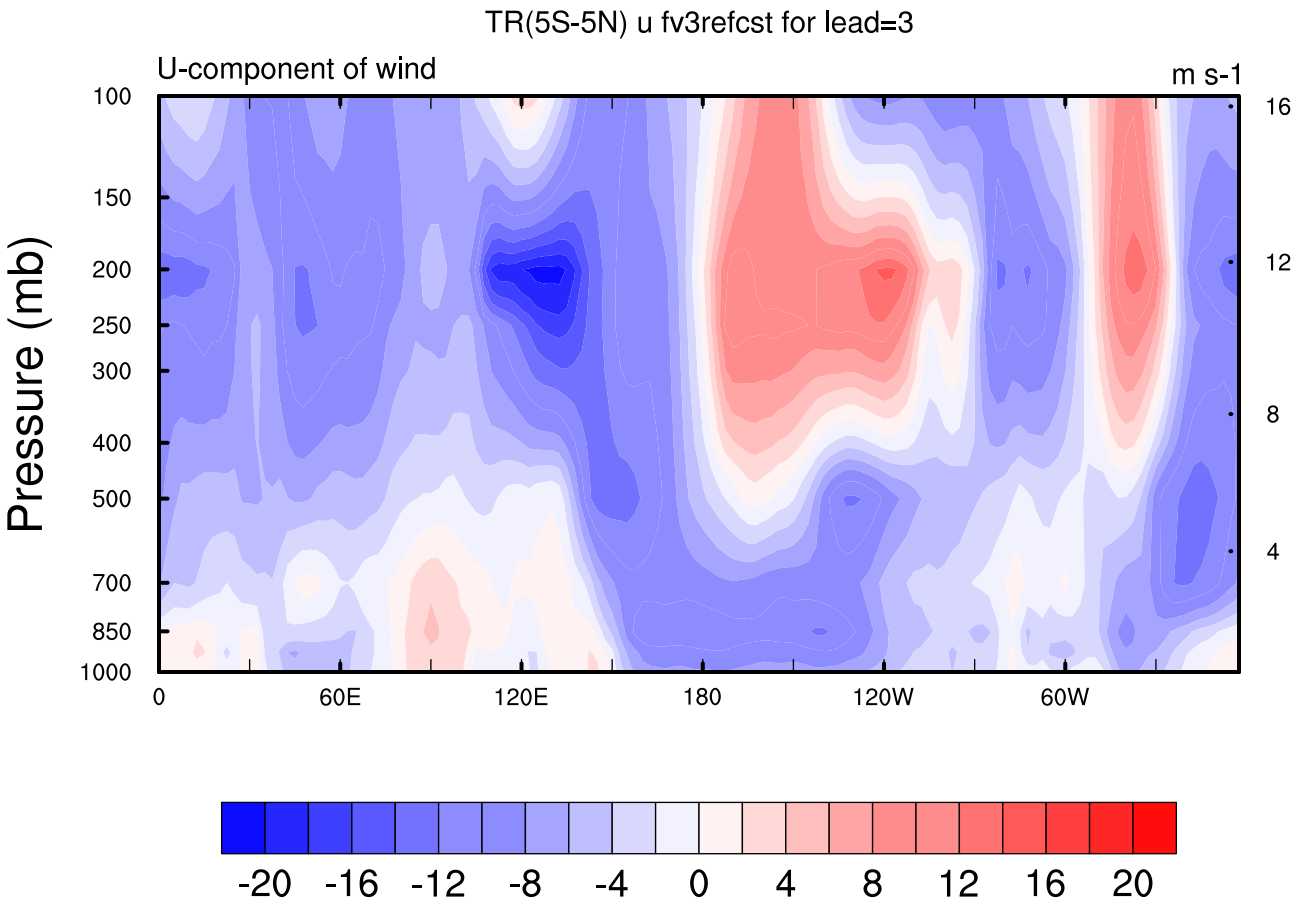

TR(5S-5N) vp fv3refcst for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

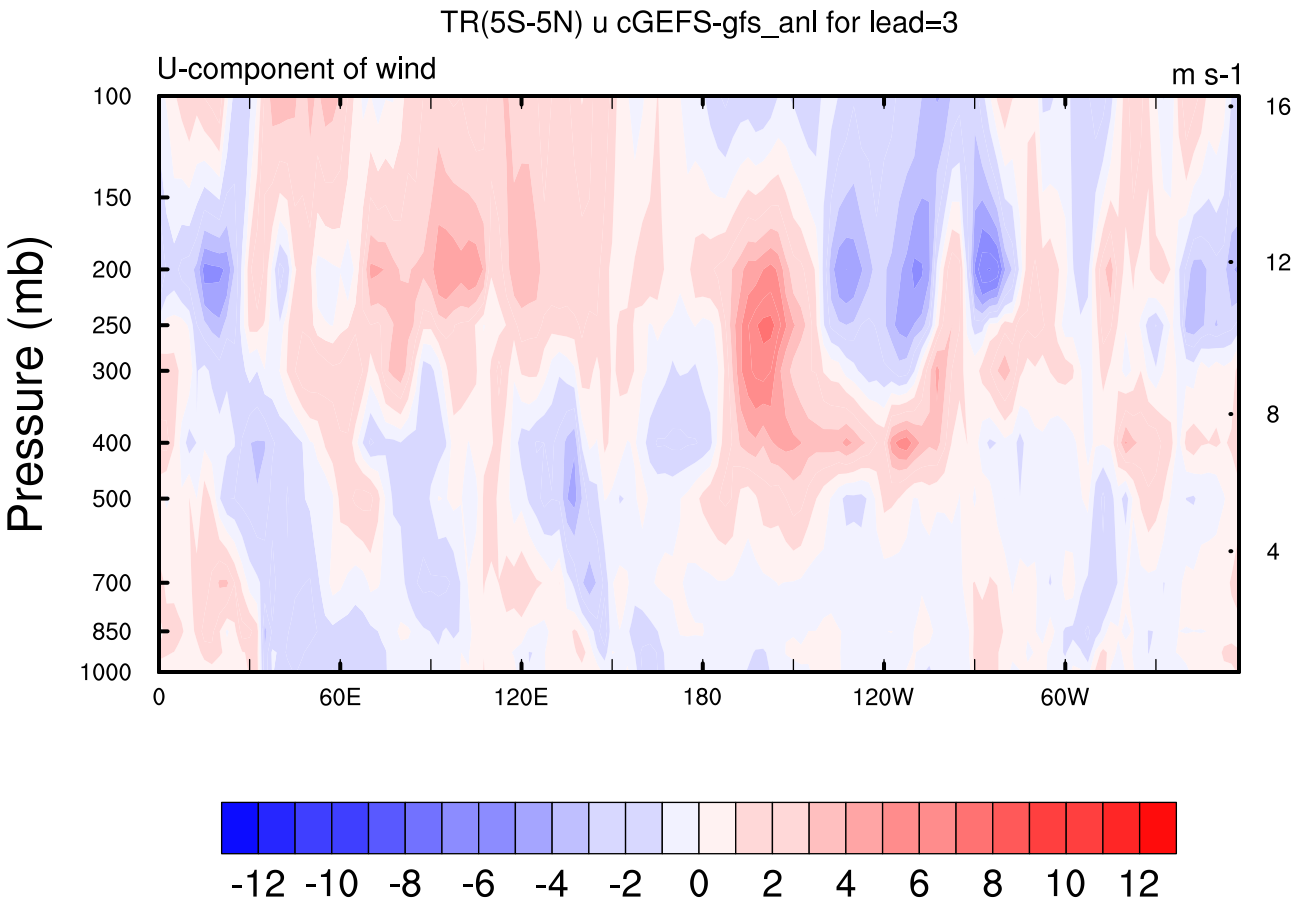

TR(5S-5N) vp cGEFS-gfs_anl for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

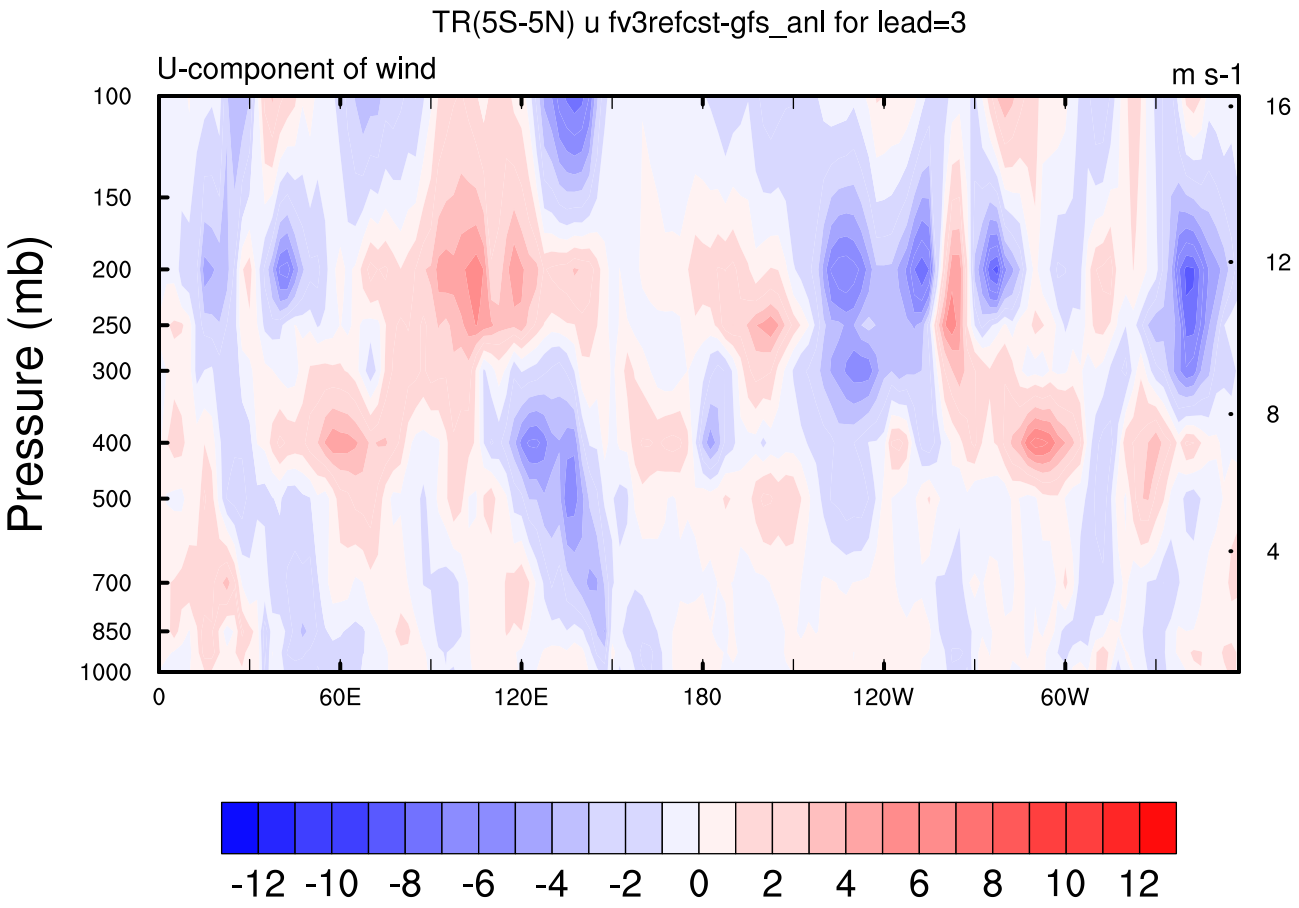

TR(5S-5N) vp fv3refcst-gfs_anl for lead=3
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

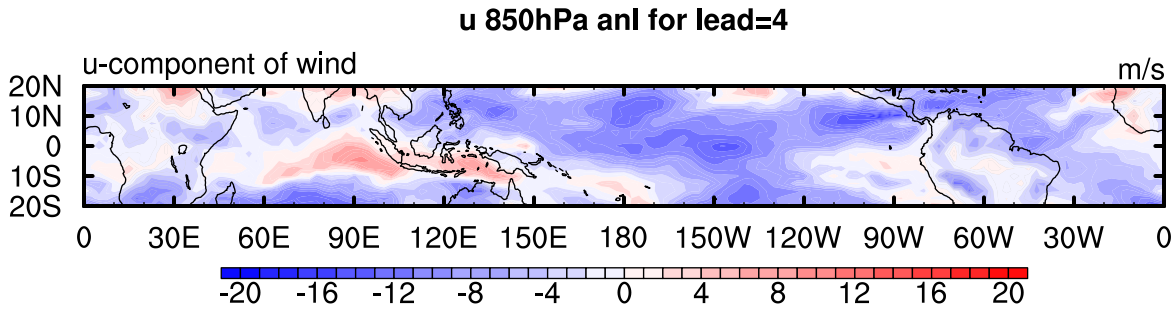

TR(5S-5N) u anl for lead=3
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

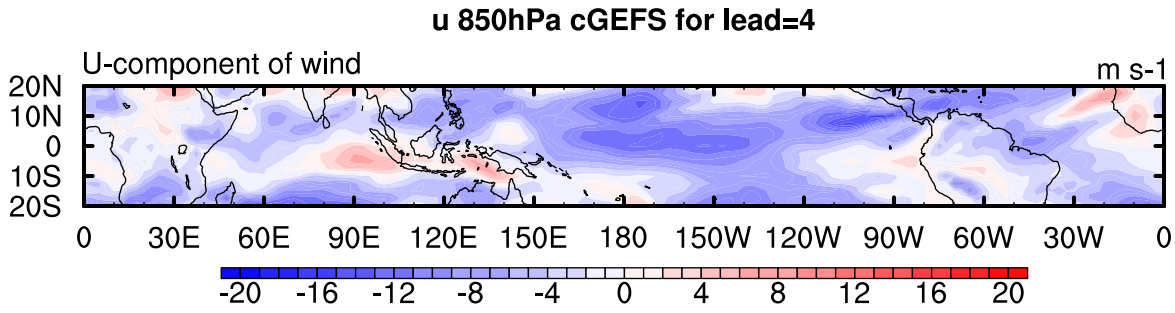

TR(5S-5N) u cGEFS for lead=3
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

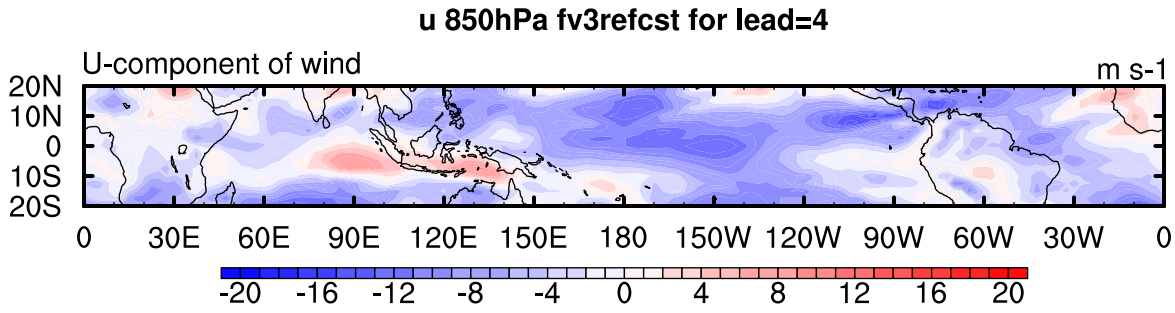

TR(5S-5N) u fv3refcst for lead=3
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

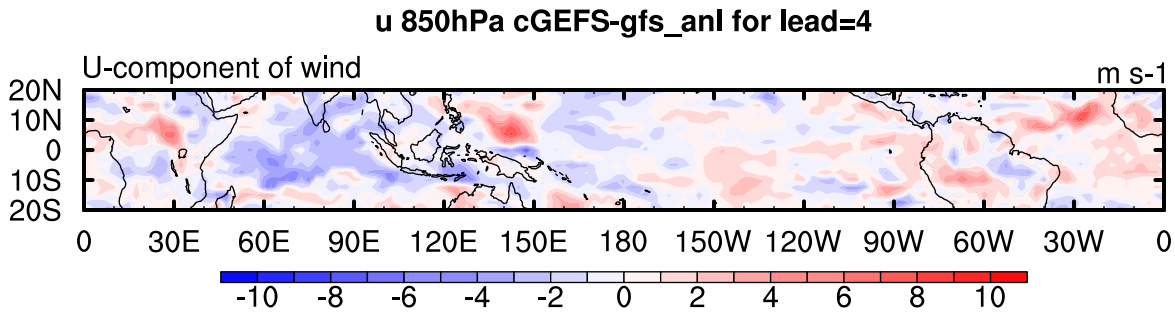

TR(5S-5N) u cGEFS-gfs_anl for lead=3
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

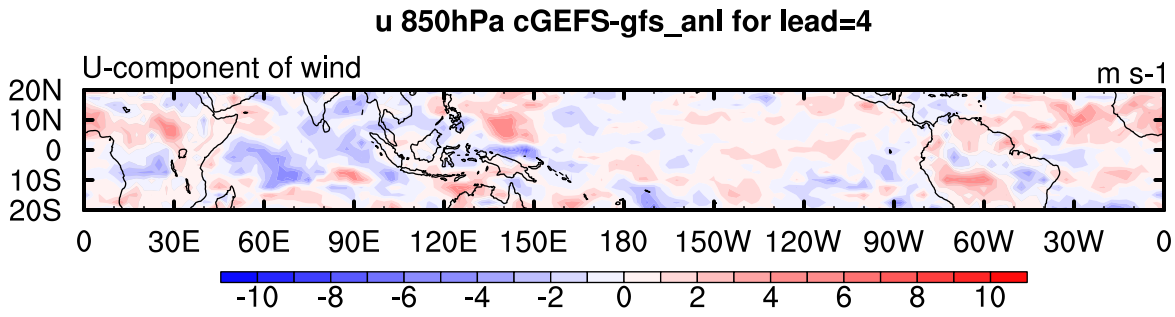

TR(5S-5N) u fv3refcst-gfs_anl for lead=3
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

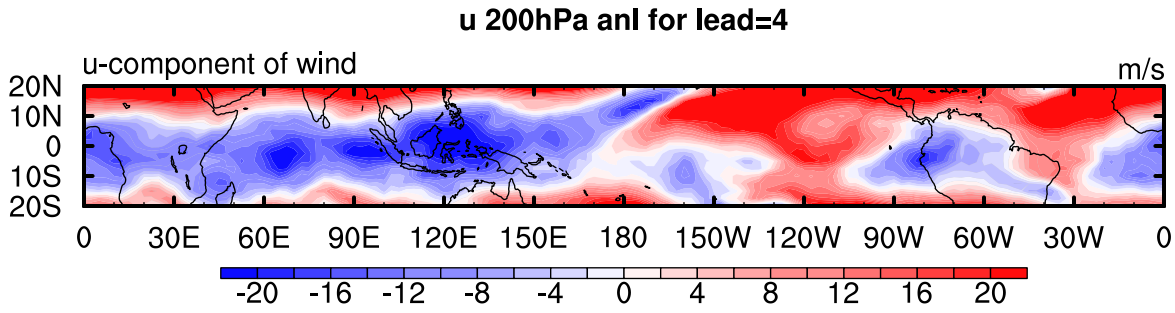

u 850hPa anl for lead=4
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

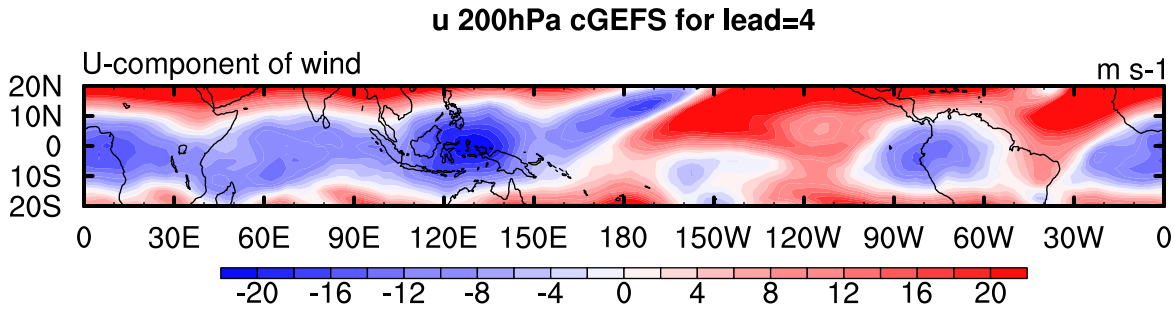

u 850hPa cGEFS for lead=4
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

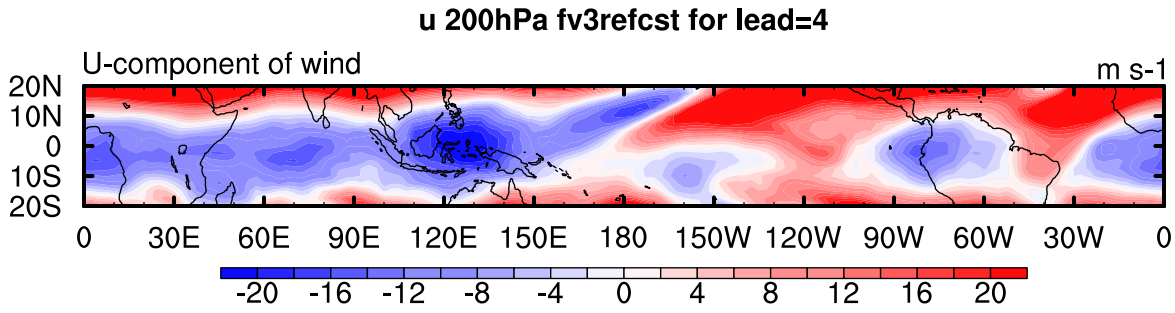

u 850hPa fv3refcst for lead=4
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

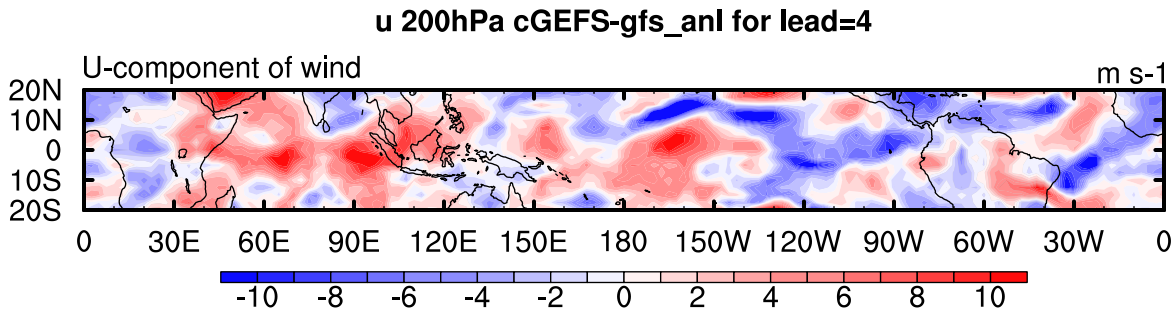

u 850hPa cGEFS-gfs_anl for lead=4
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

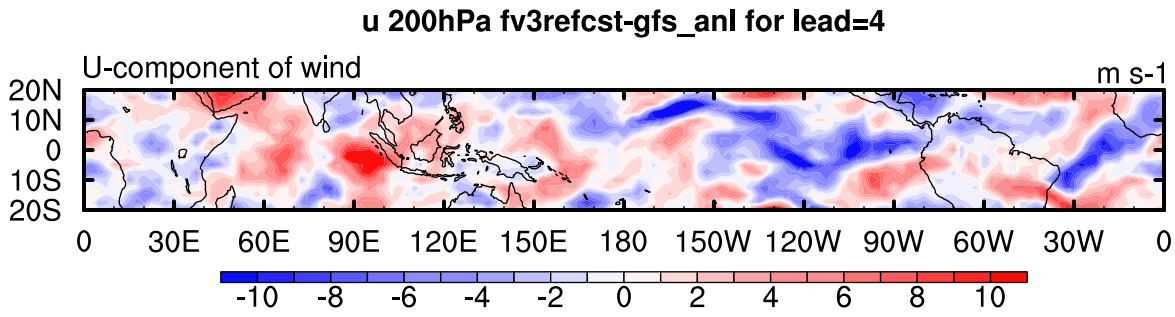

u 850hPa cGEFS-gfs_anl for lead=4
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=4
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=4
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=4
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=4
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=4
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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-6
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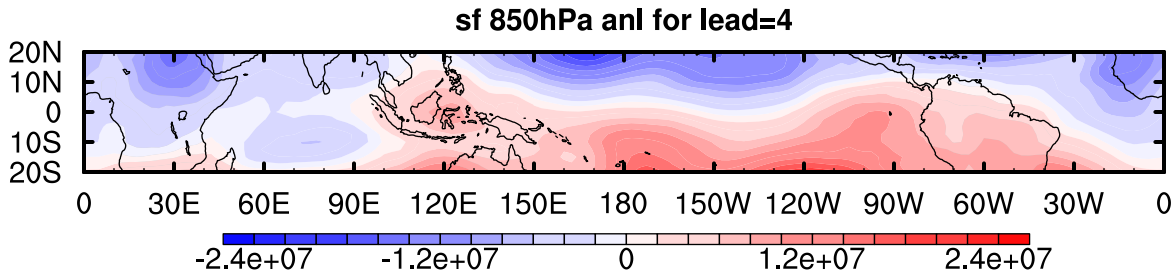
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10N
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10S
20S
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30E
60E
90E
120E
150E
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30W
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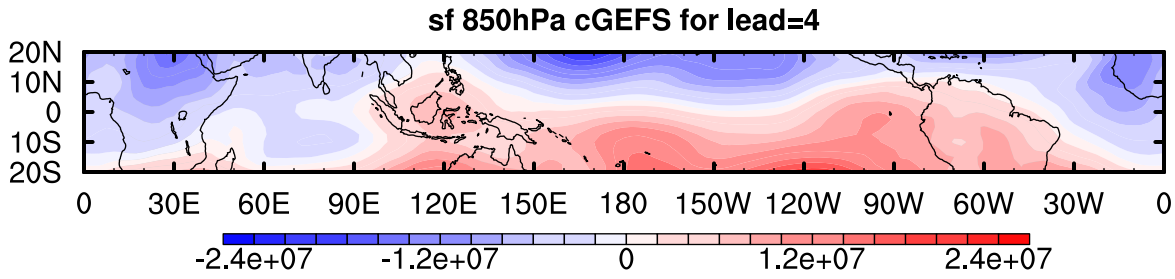
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20S
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30E
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90E
120E
150E
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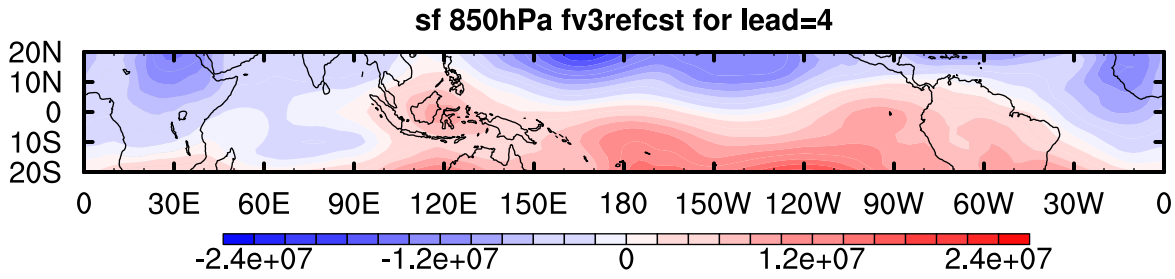
2.4e+07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10S
20S
0
30E
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90E
120E
150E
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60W
30W
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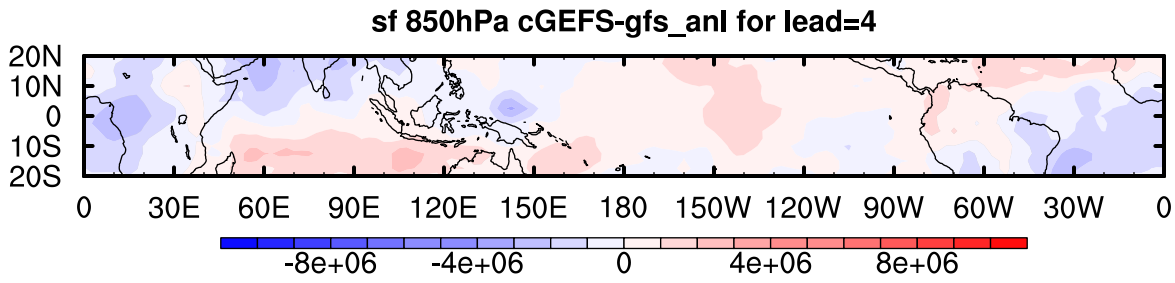
2.4e+07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90E
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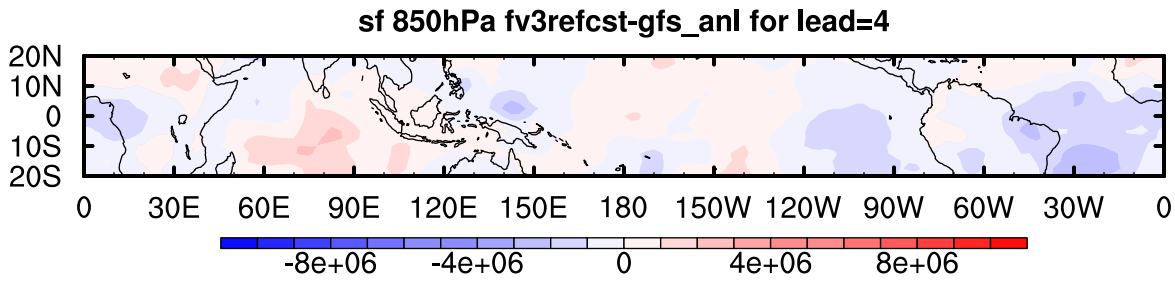
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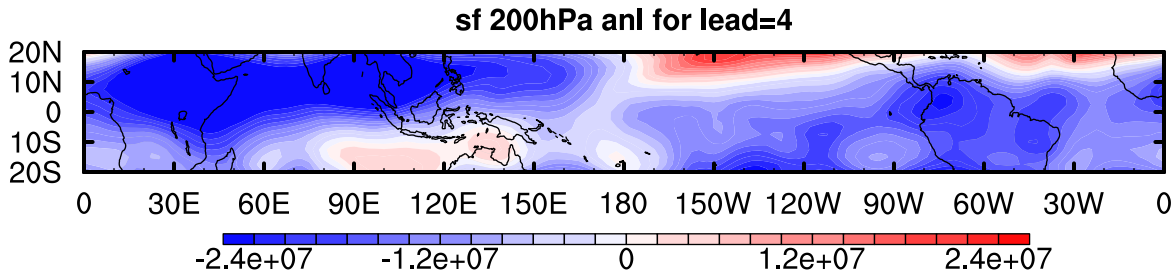
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10N
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120E
150E
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60W
30W
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0
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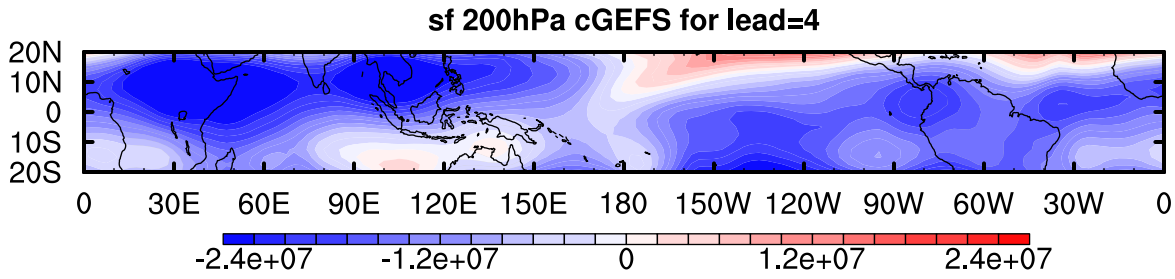
2.4e+07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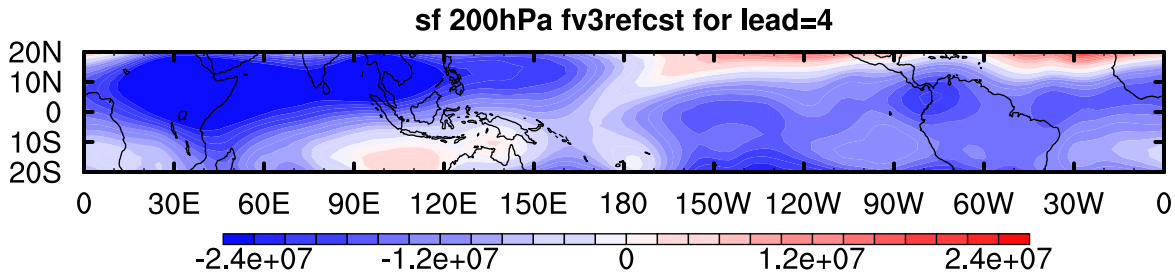
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90E
120E
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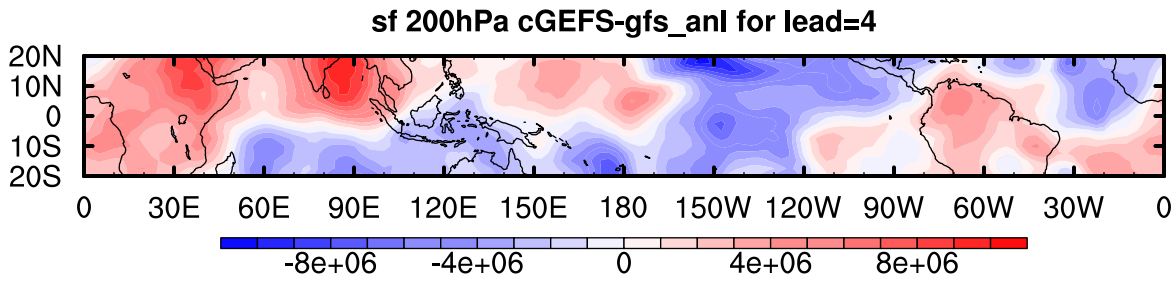
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10S
20S
0
30E
60E
90E
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120W
90W
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30W
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-4e+06
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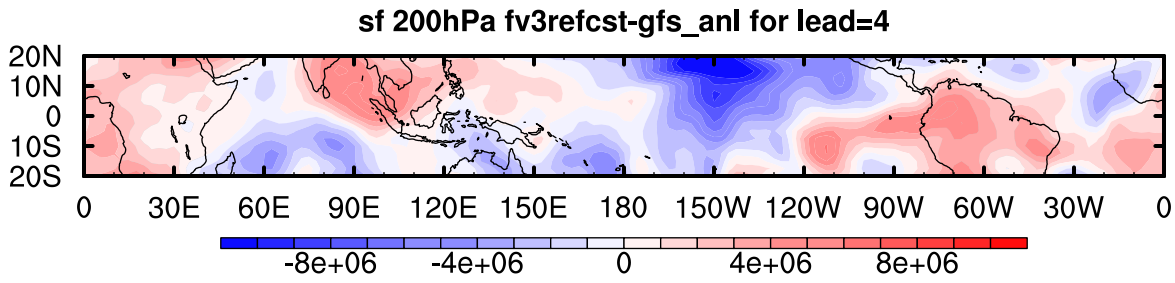
8e+06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10S
20S
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30E
60E
90E
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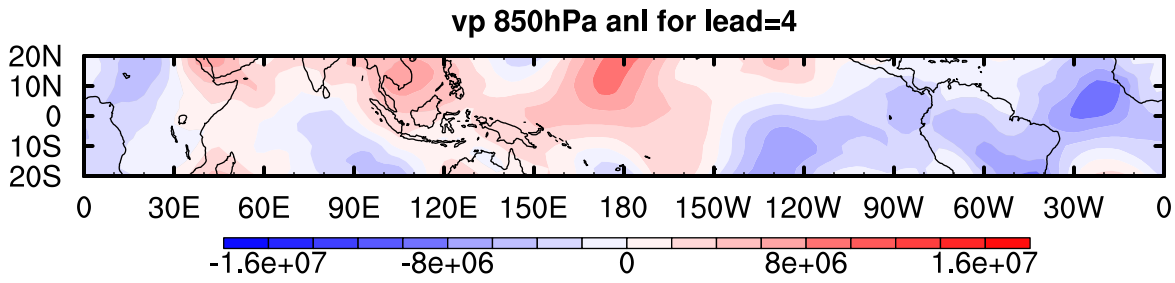
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10N
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10S
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30E
60E
90E
120E
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60W
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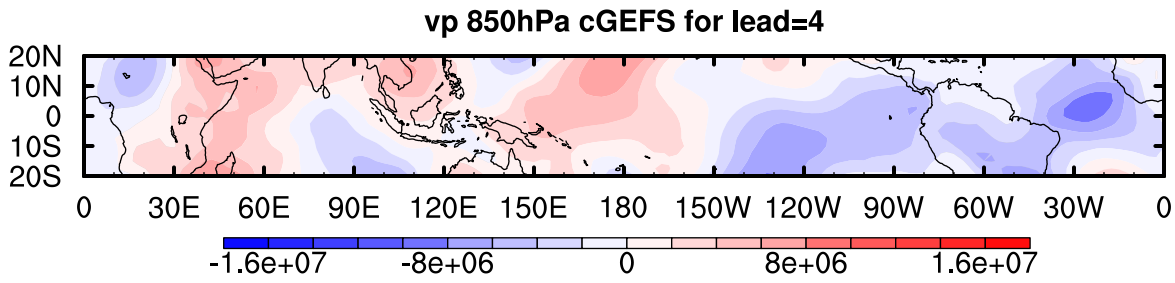
1.6e+07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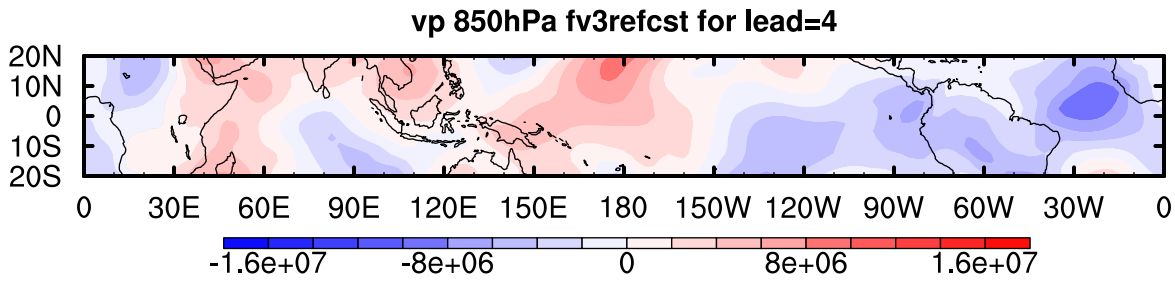
vp 850hPa fv3refcst for lead=4
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10N
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10S
20S
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30E
60E
90E
120E
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-8e+06
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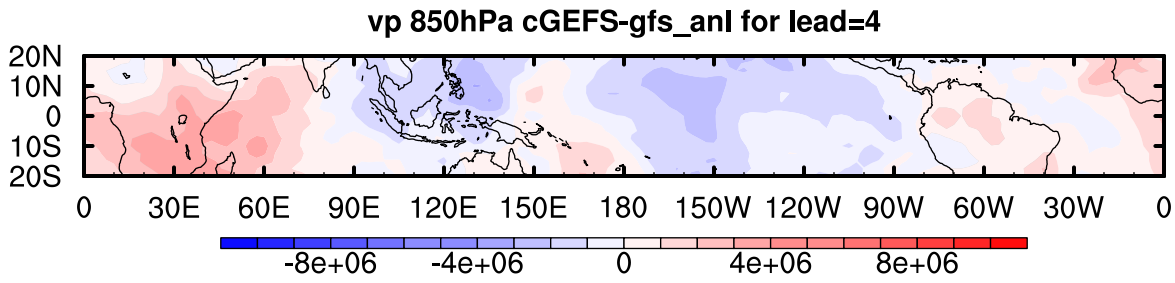
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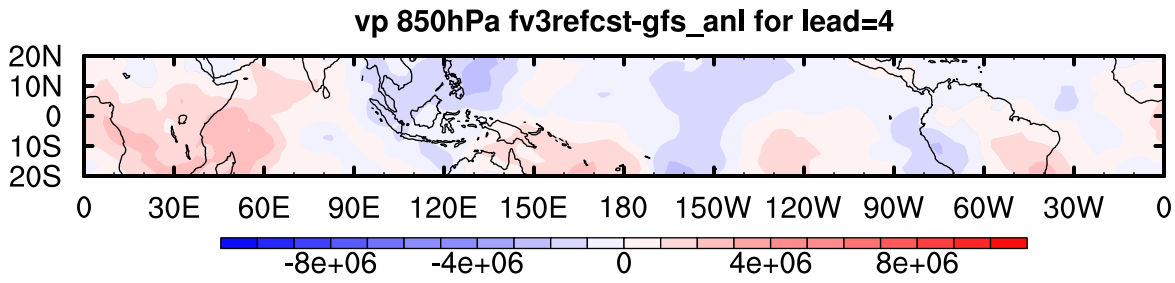
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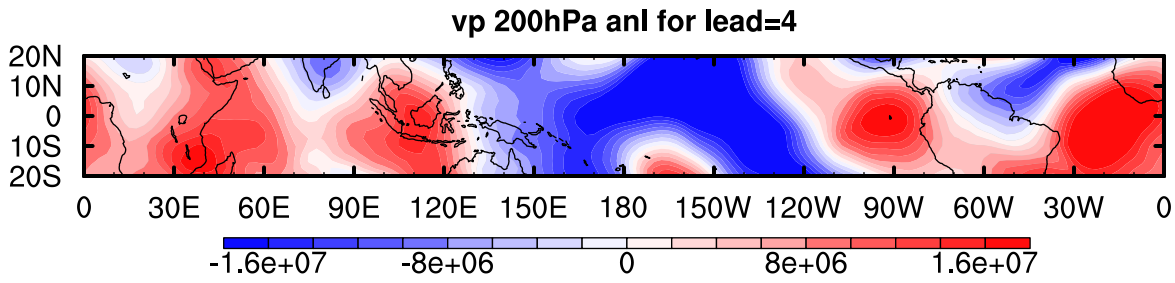
vp 200hPa anl for lead=4
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10N
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10S
20S
0
30E
60E
90E
120E
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60W
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-8e+06
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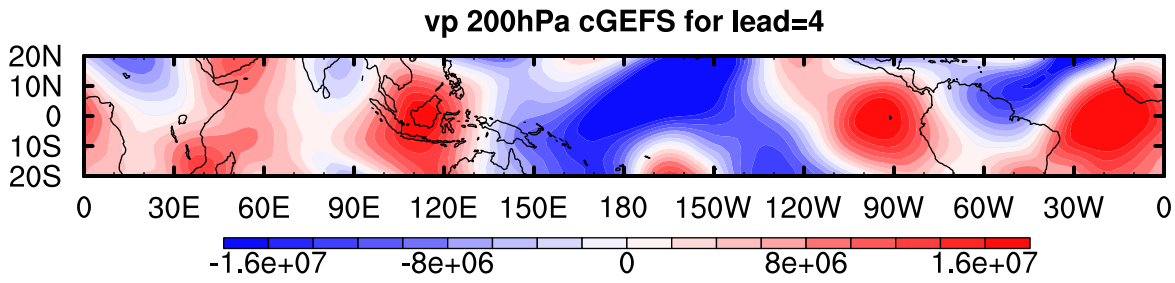
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10N
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10S
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30E
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90E
120E
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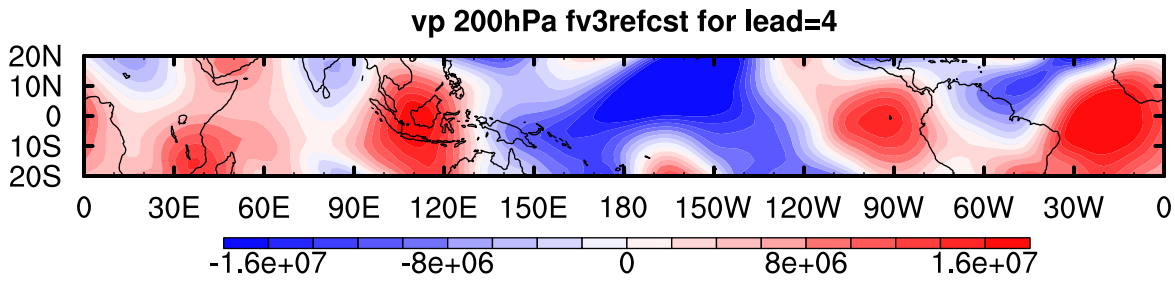
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10S
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30E
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90E
120E
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-8e+06
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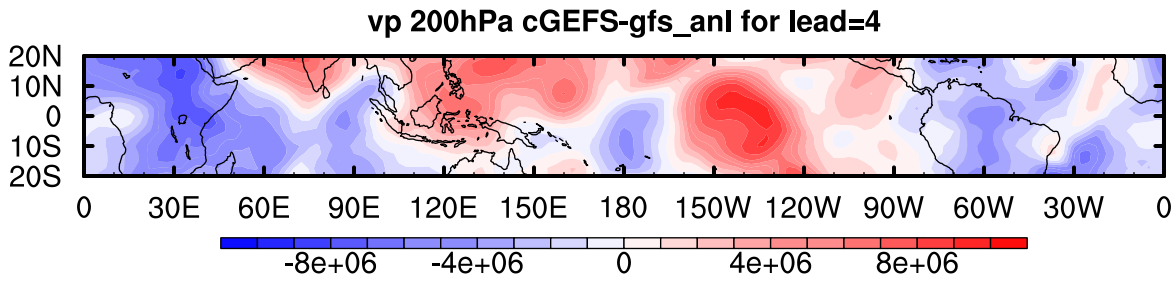
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10N
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10S
20S
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30E
60E
90E
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30W
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-4e+06
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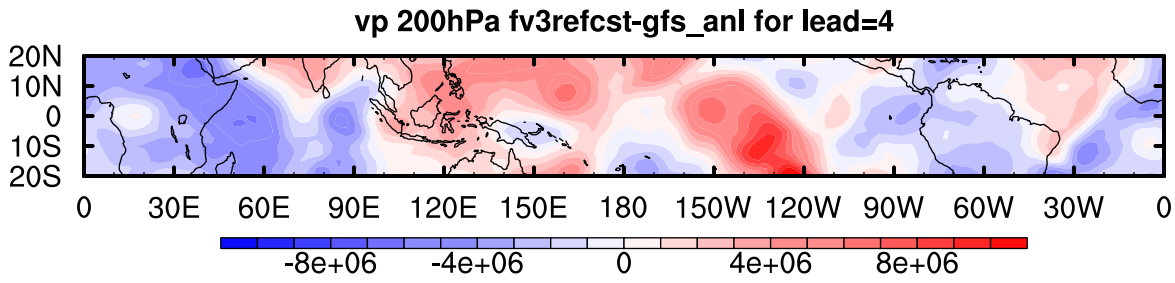
8e+06


vp 200hPa fv3refcst-gfs_anl for lead=4
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10N
0
10S
20S
0
30E
60E
90E
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30W
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-4e+06
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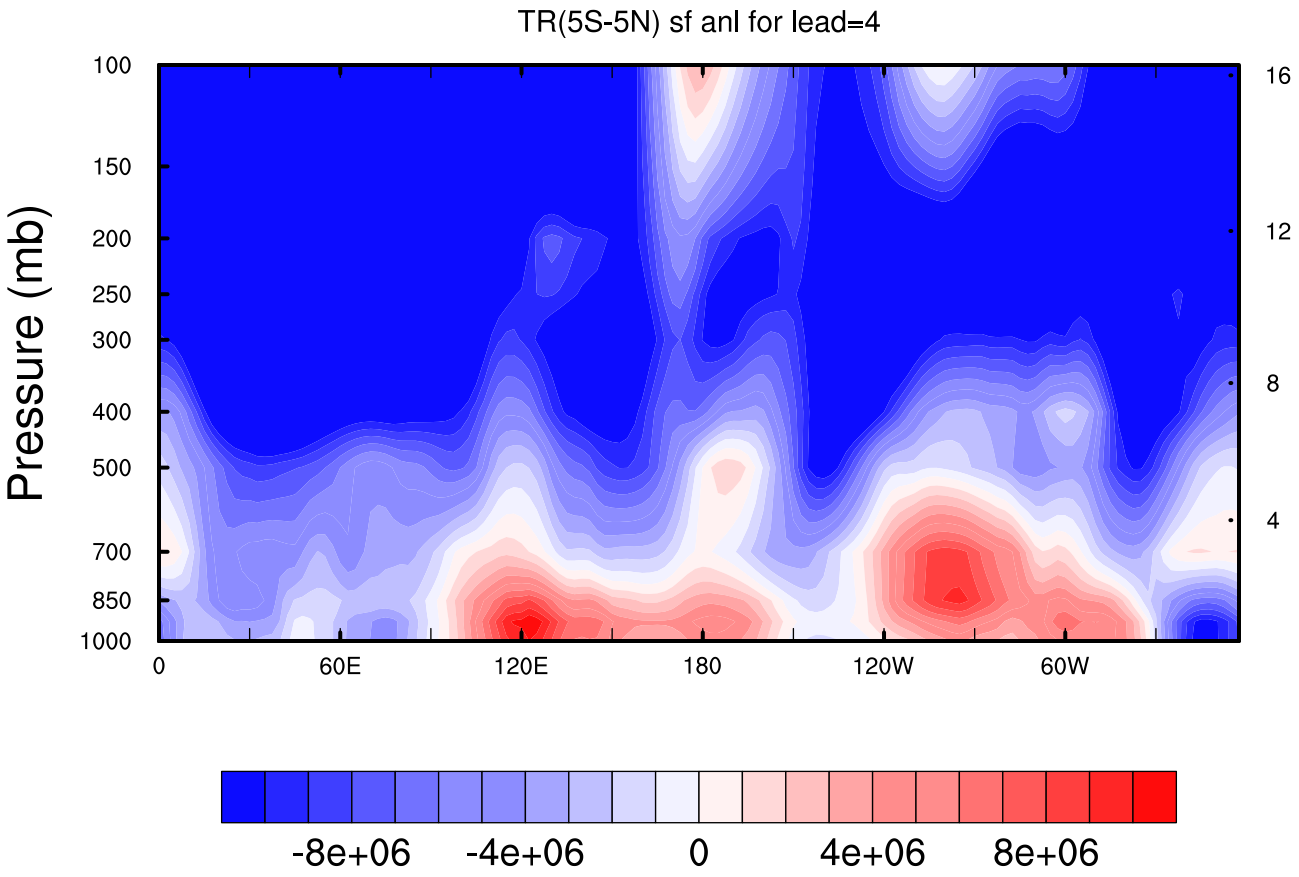
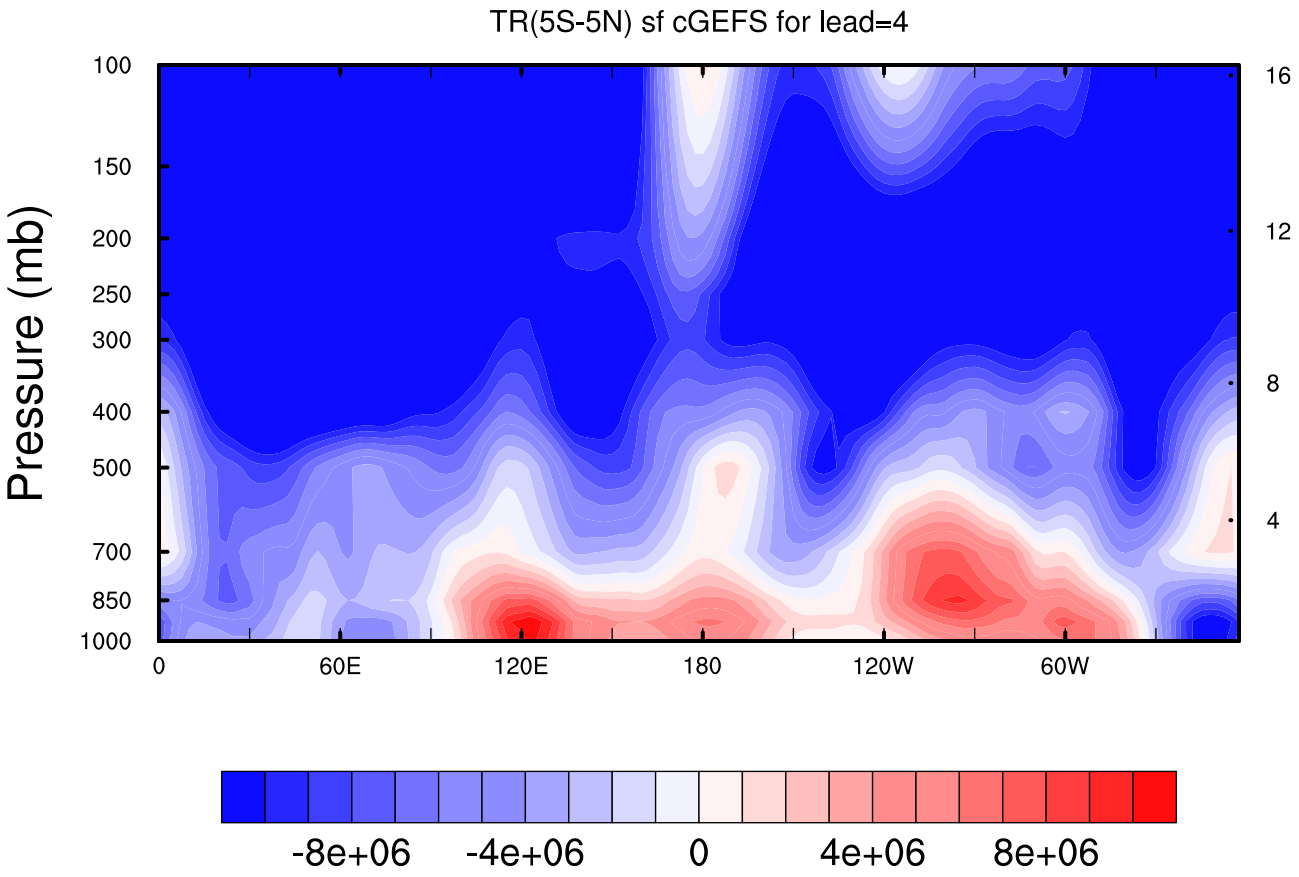

TR(5S-5N) sf anl for lead=4
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) sf cGEFS for lead=4
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
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120E
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120W
60W
16
12
8
4
-8e+06
-4e+06
0
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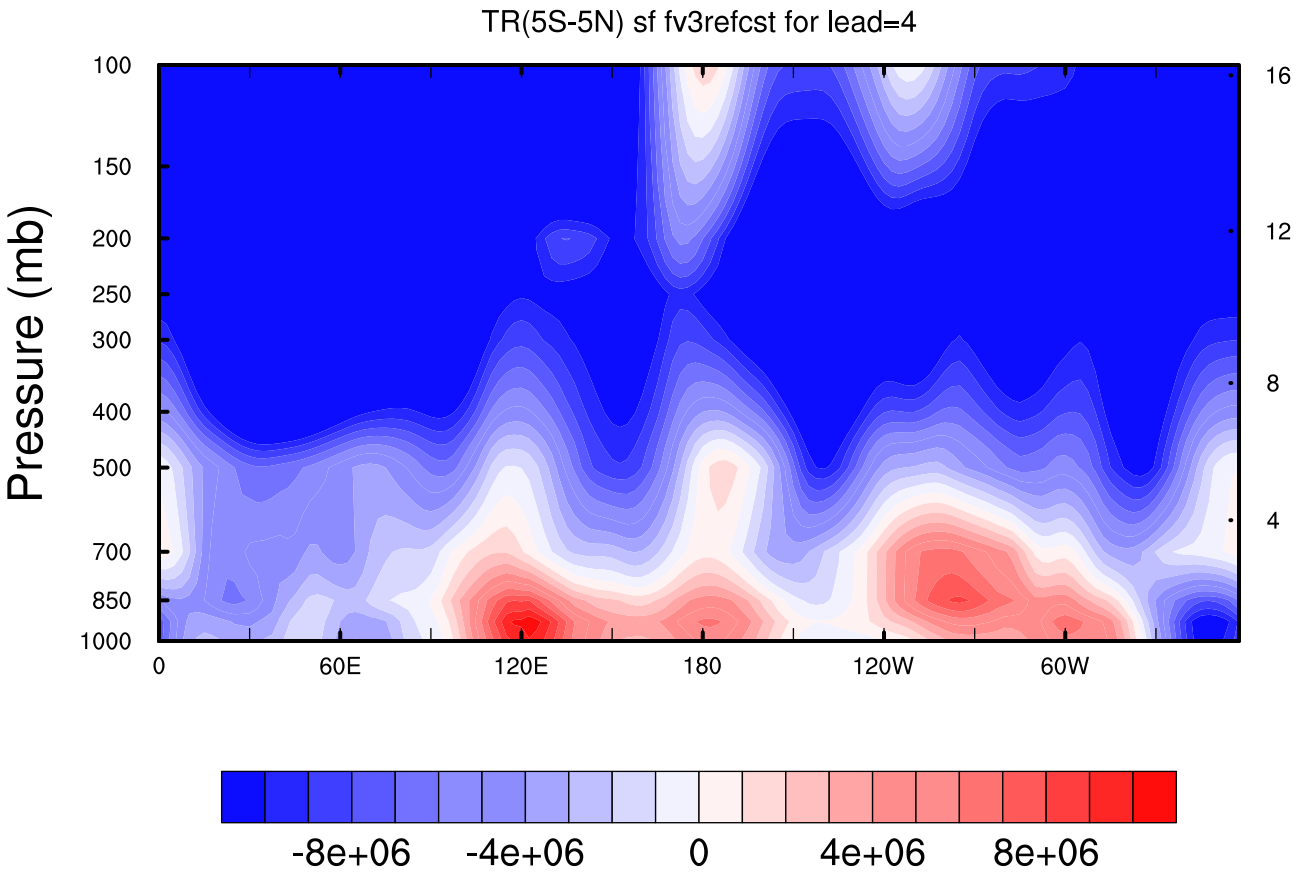
8e+06


TR(5S-5N) sf fv3refcst for lead=4
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
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12
8
4
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60E
120E
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120W
60W
-8e+06
-4e+06
0
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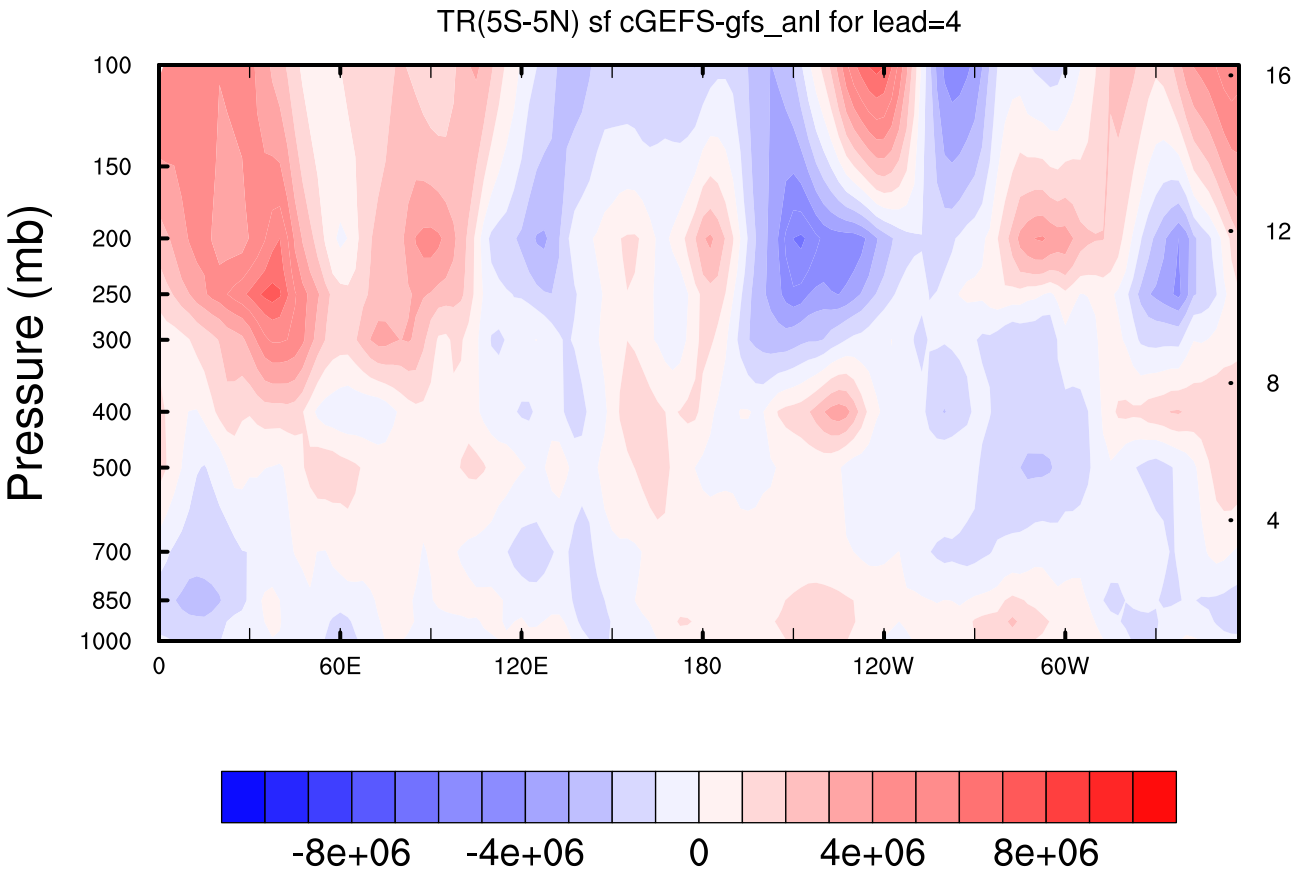
8e+06


TR(5S-5N) sf cGEFS-gfs_anl for lead=4
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
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120E
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120W
60W
16
12
8
4
-8e+06
-4e+06
0
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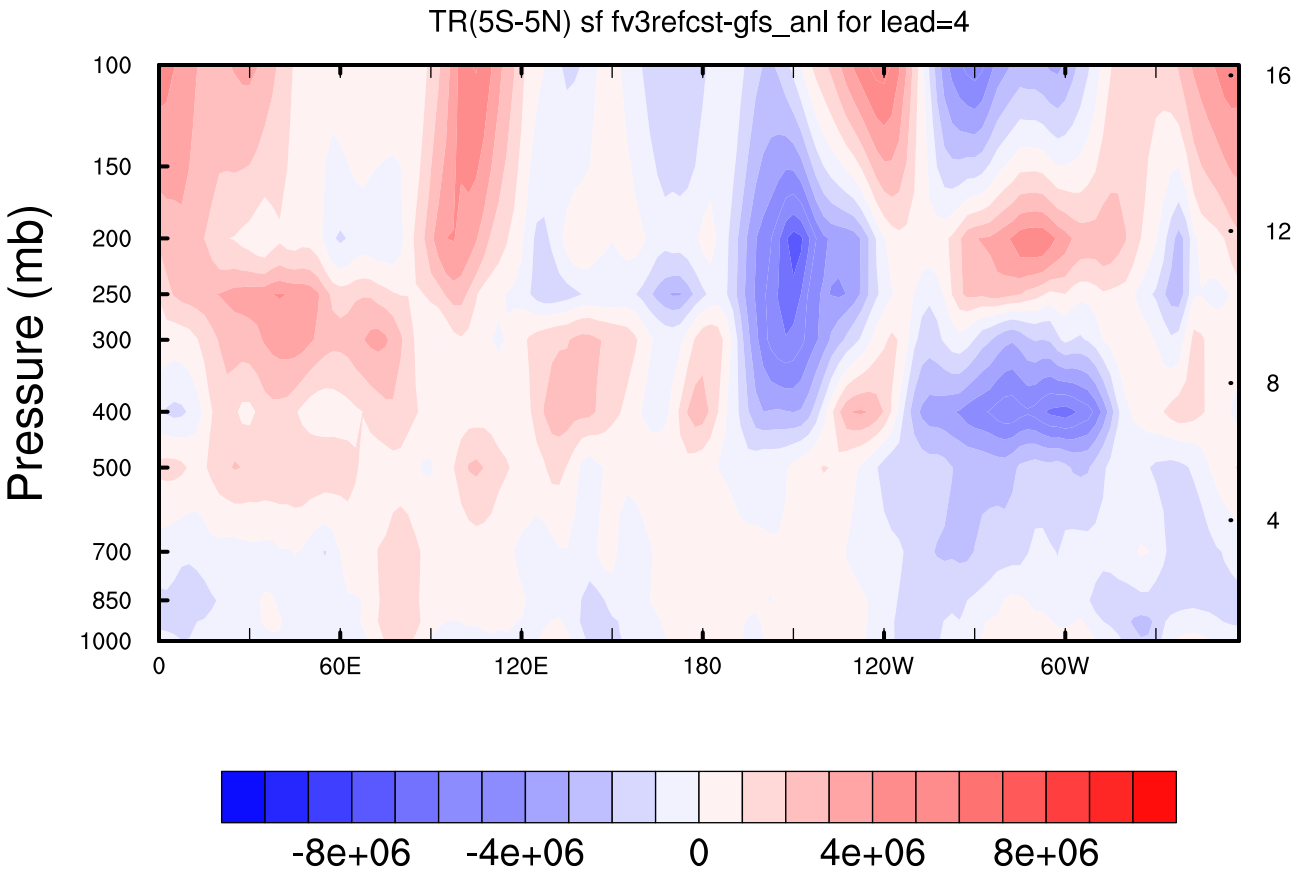
8e+06


TR(5S-5N) sf fv3refcst-gfs_anl for lead=4
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
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120E
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120W
60W
16
12
8
4
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-4e+06
0
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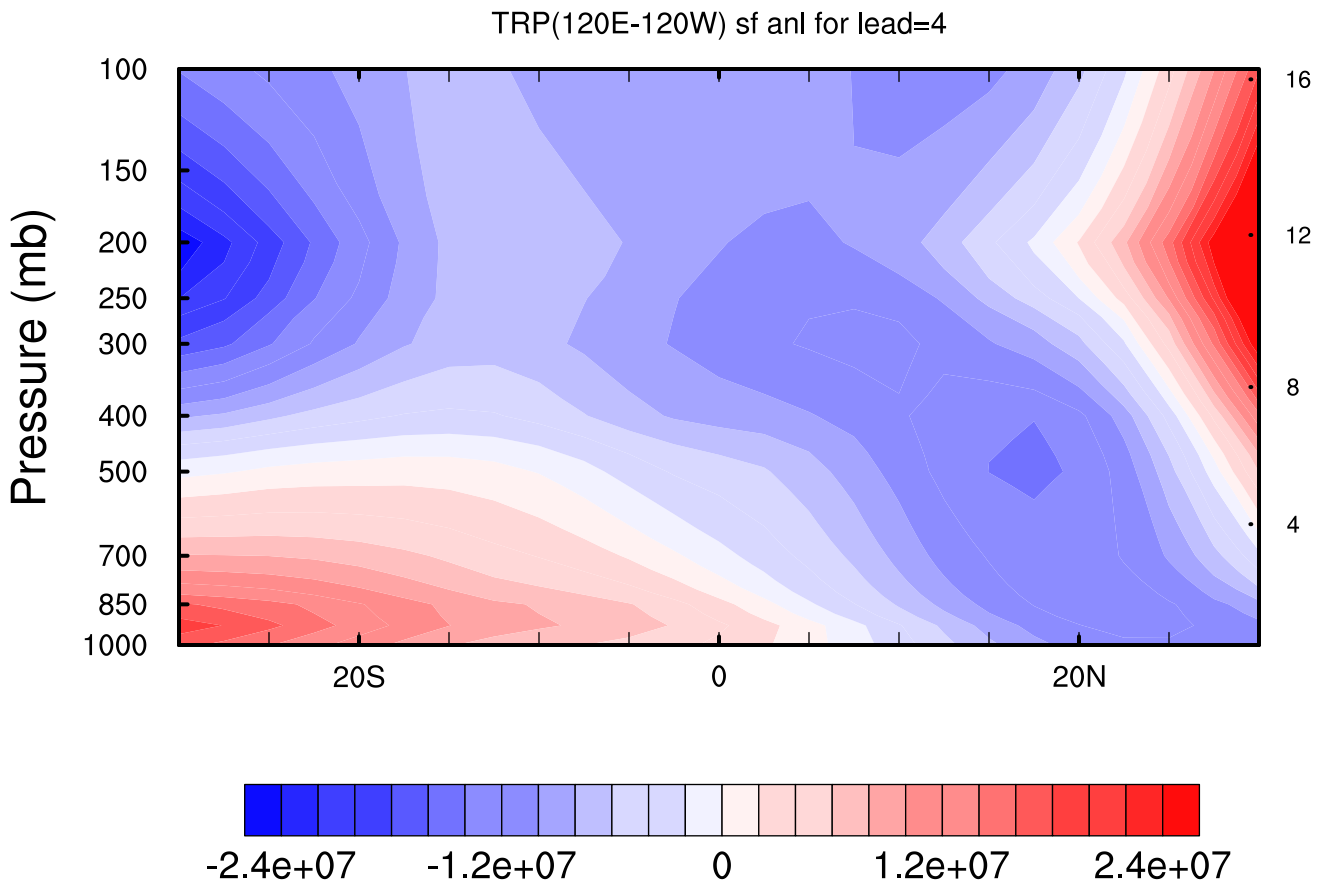
8e+06


TRP(120E-120W) sf anl for lead=4
Pressure (mb)
100
150
200
250
300
400
500
700
850
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20S
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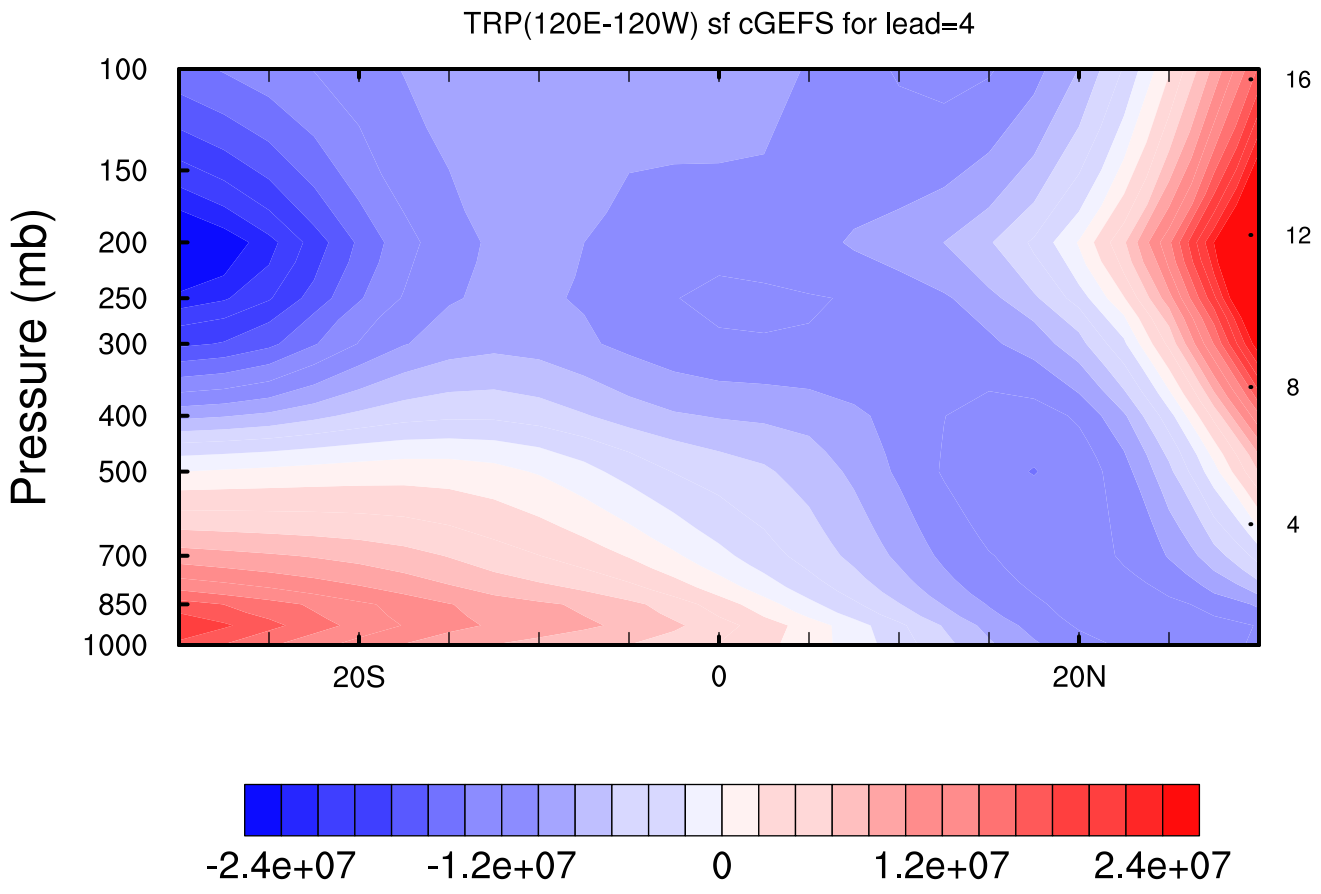
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


TRP(120E-120W) sf cGEFS for lead=4
Pressure (mb)
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150
200
250
300
400
500
700
850
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0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
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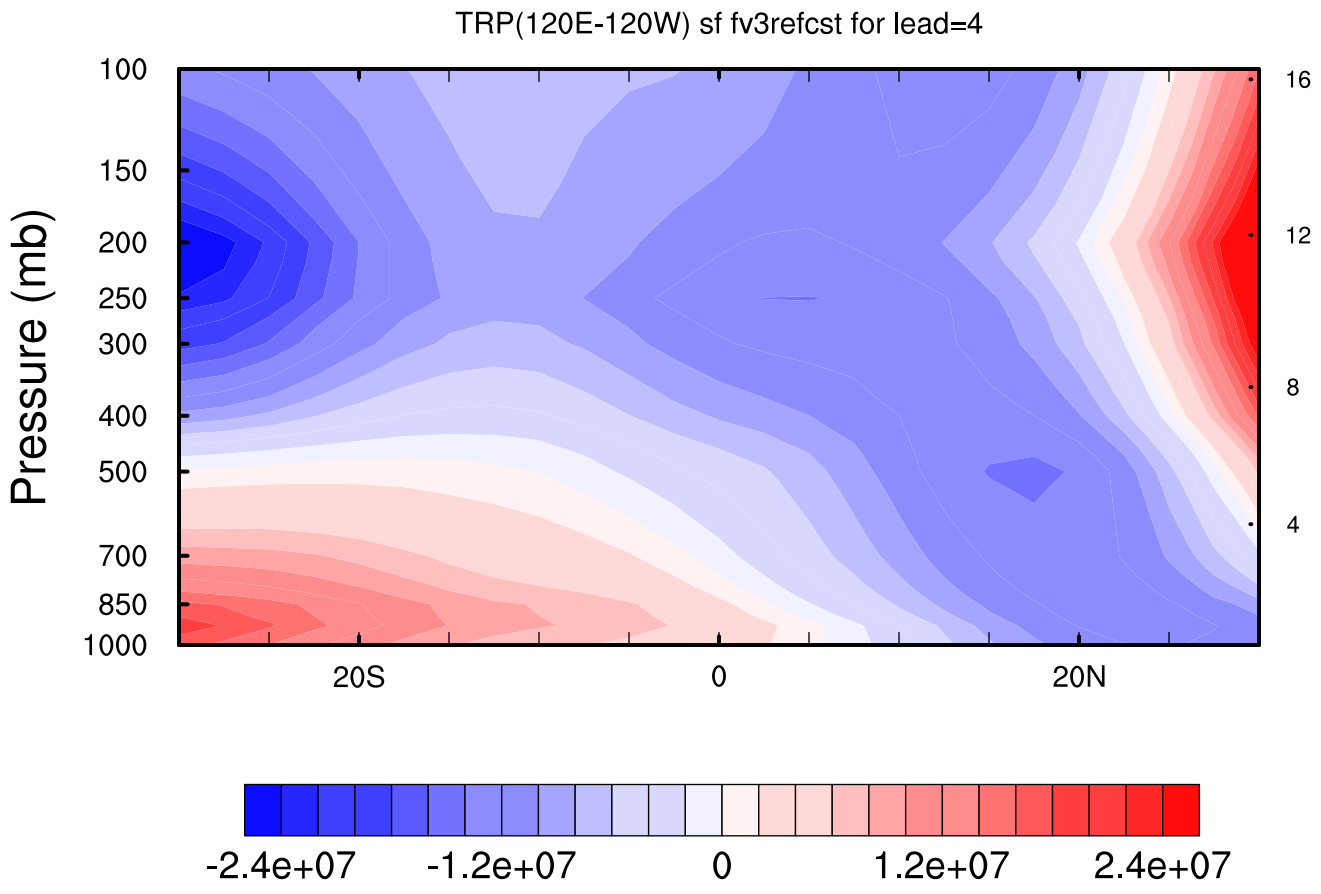
2.4e+07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Pressure (mb)
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150
200
250
300
400
500
700
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12
8
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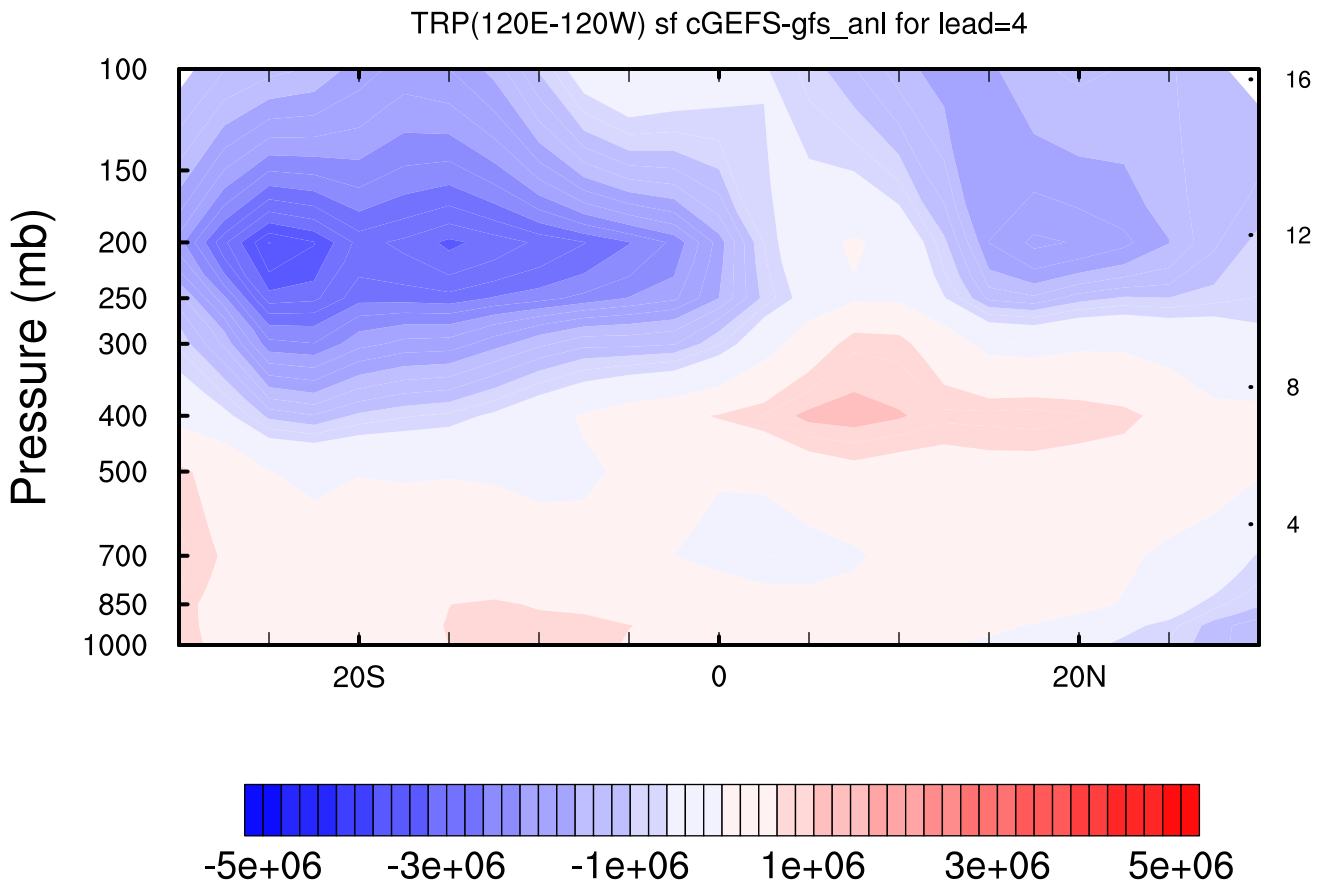
2.4e+07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Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
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12
8
4
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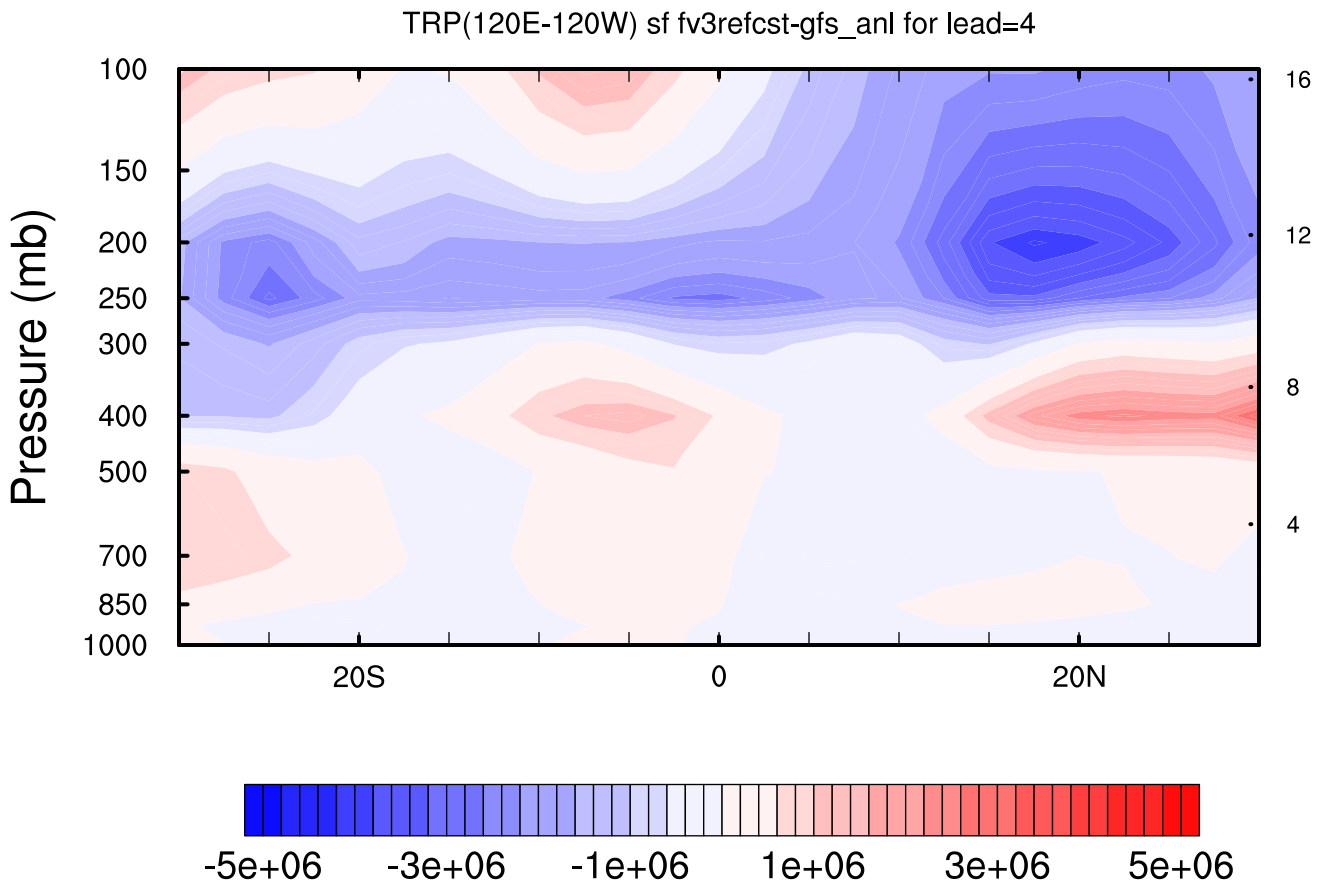
-3e+06
-1e+06
1e+06
3e+06
5e+06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Pressure (mb)
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150
200
250
300
400
500
700
850
1000
20S
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20N
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12
8
4
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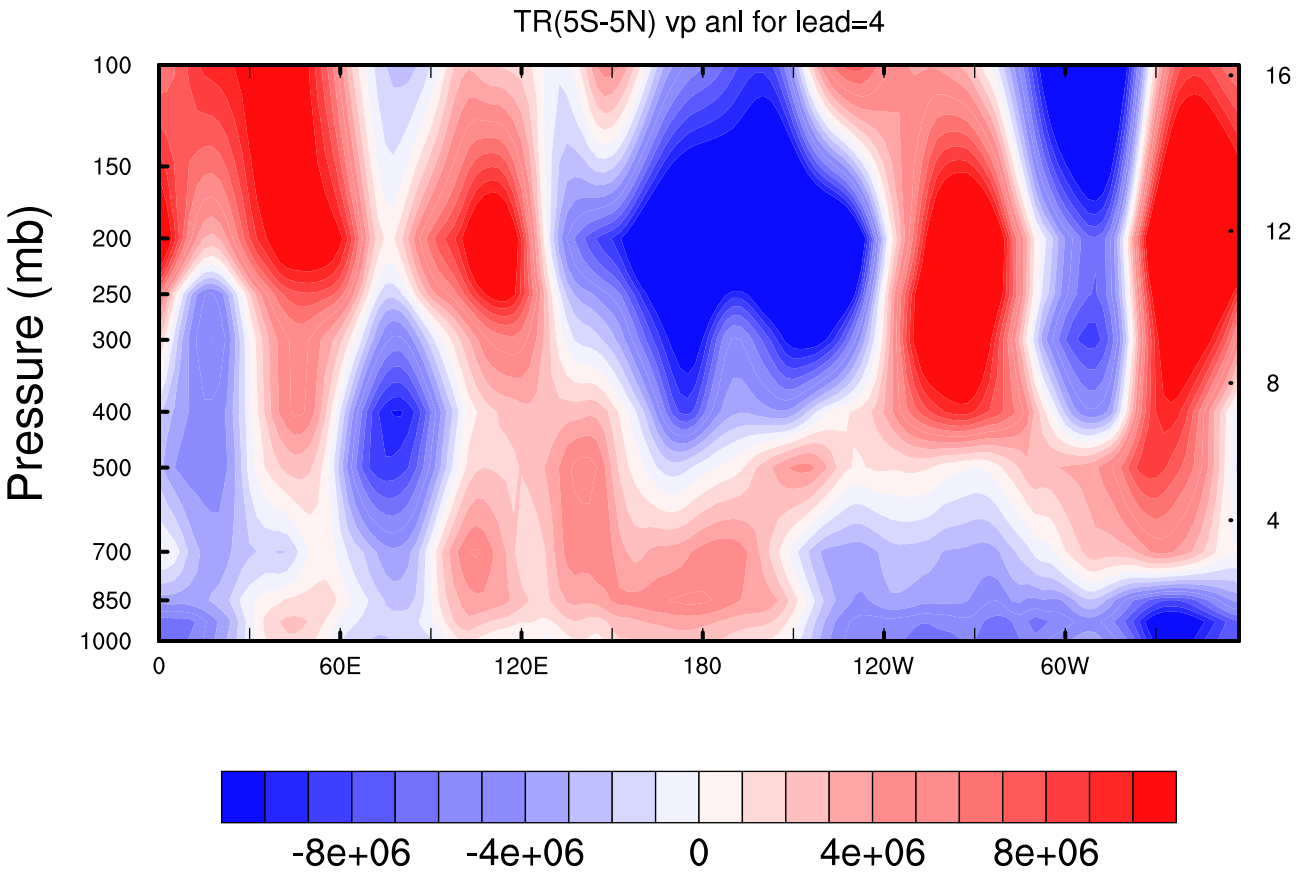
-3e+06
-1e+06
1e+06
3e+06
5e+06


TR(5S-5N) vp anl for lead=4
Pressure (mb)
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150
200
250
300
400
500
700
850
1000
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120E
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120W
60W
16
12
8
4
-8e+06
-4e+06
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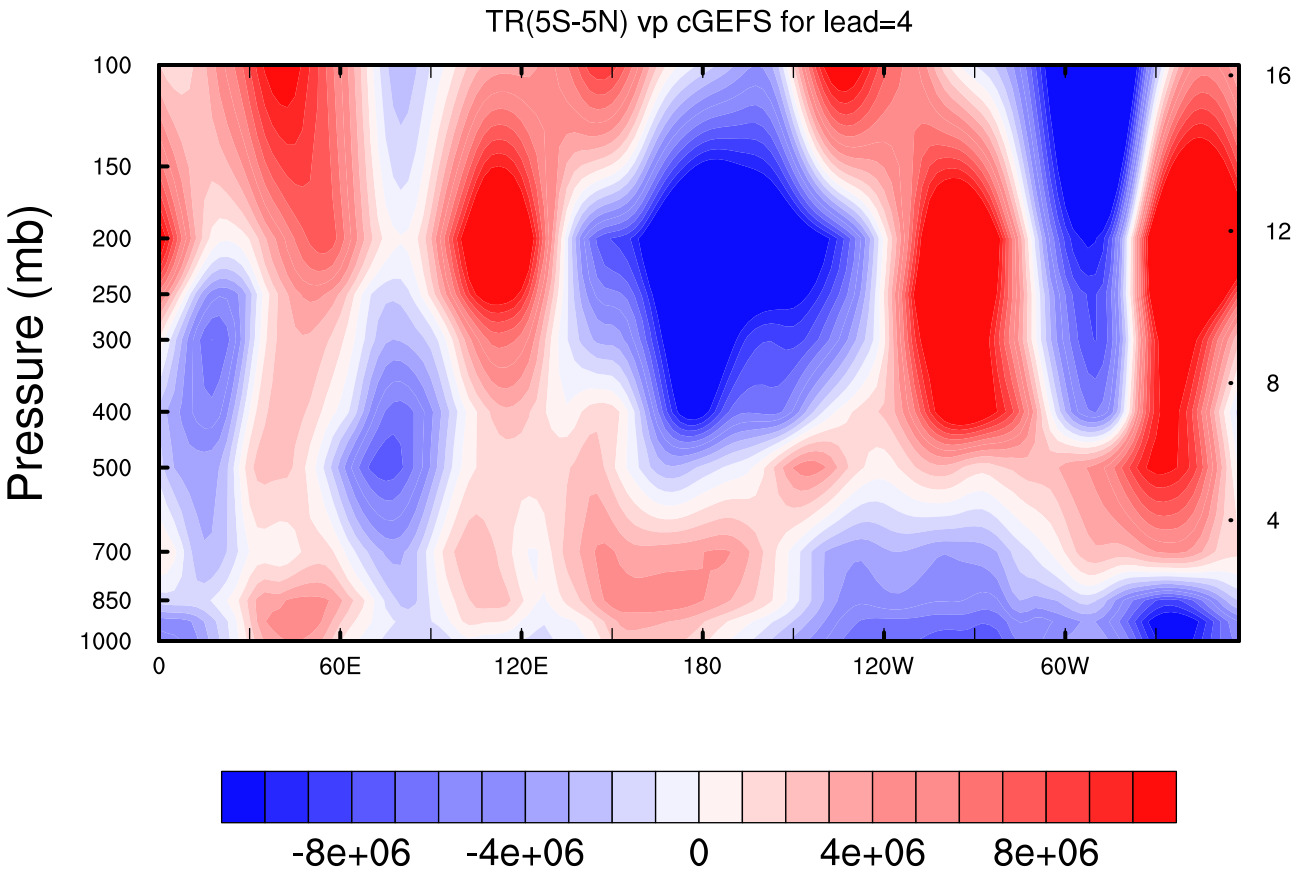
8e+06


TR(5S-5N) vp cGEFS for lead=4
Pressure (mb)
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200
250
300
400
500
700
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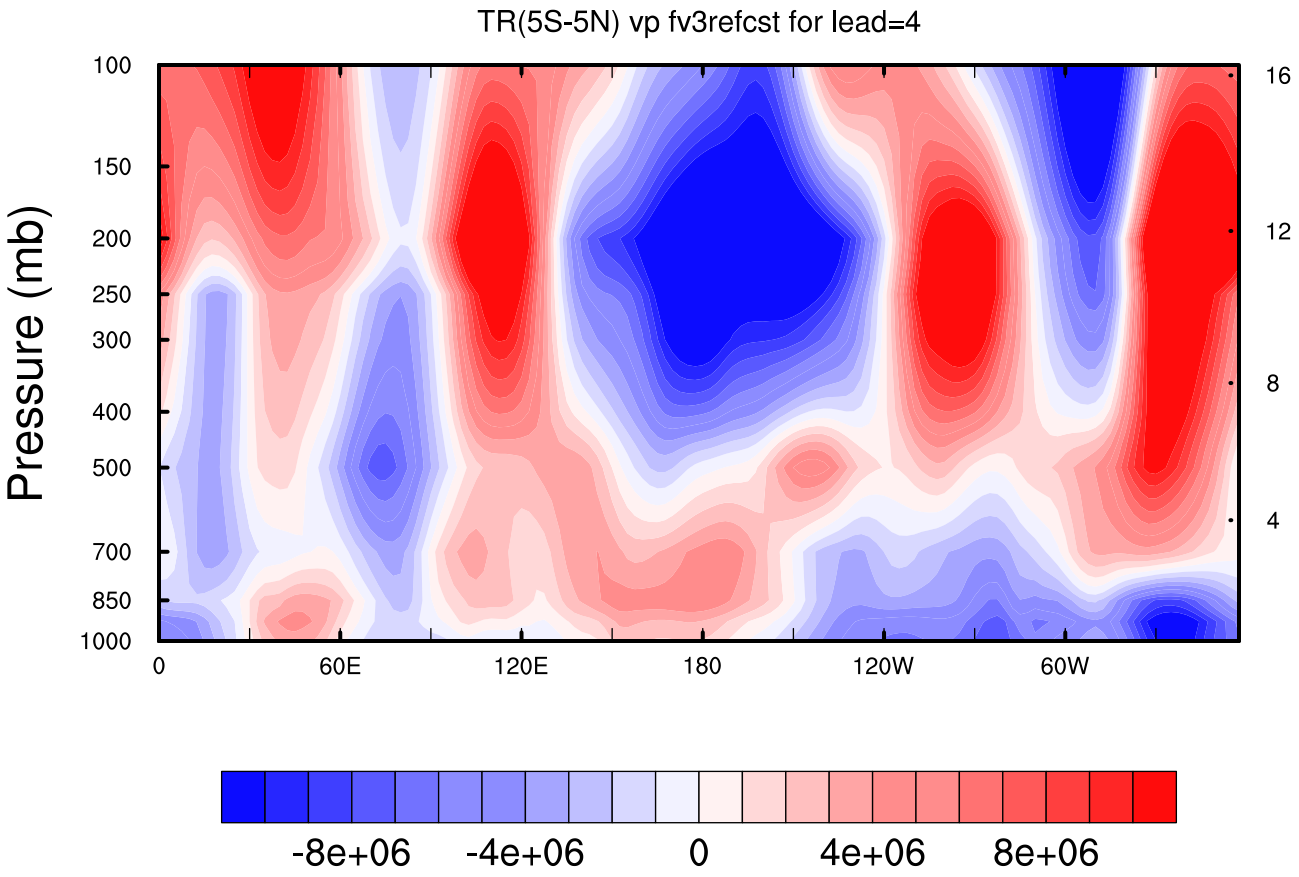
TR(5S-5N) vp fv3refcst for lead=4
Pressure (mb)
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200
250
300
400
500
700
850
1000
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120E
180
120W
60W
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12
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-8e+06
-4e+06
0
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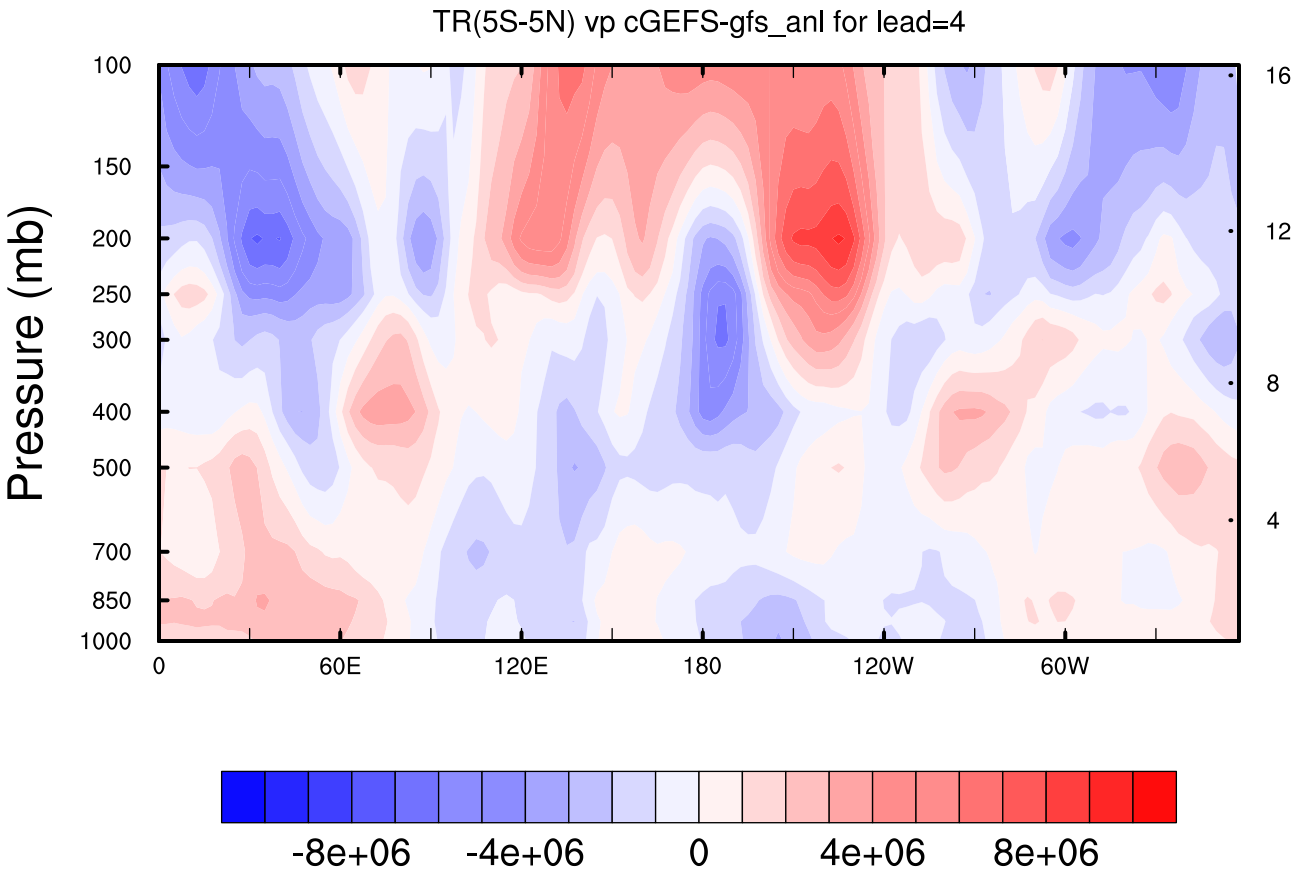
8e+06


TR(5S-5N) vp cGEFS-gfs_anl for lead=4
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
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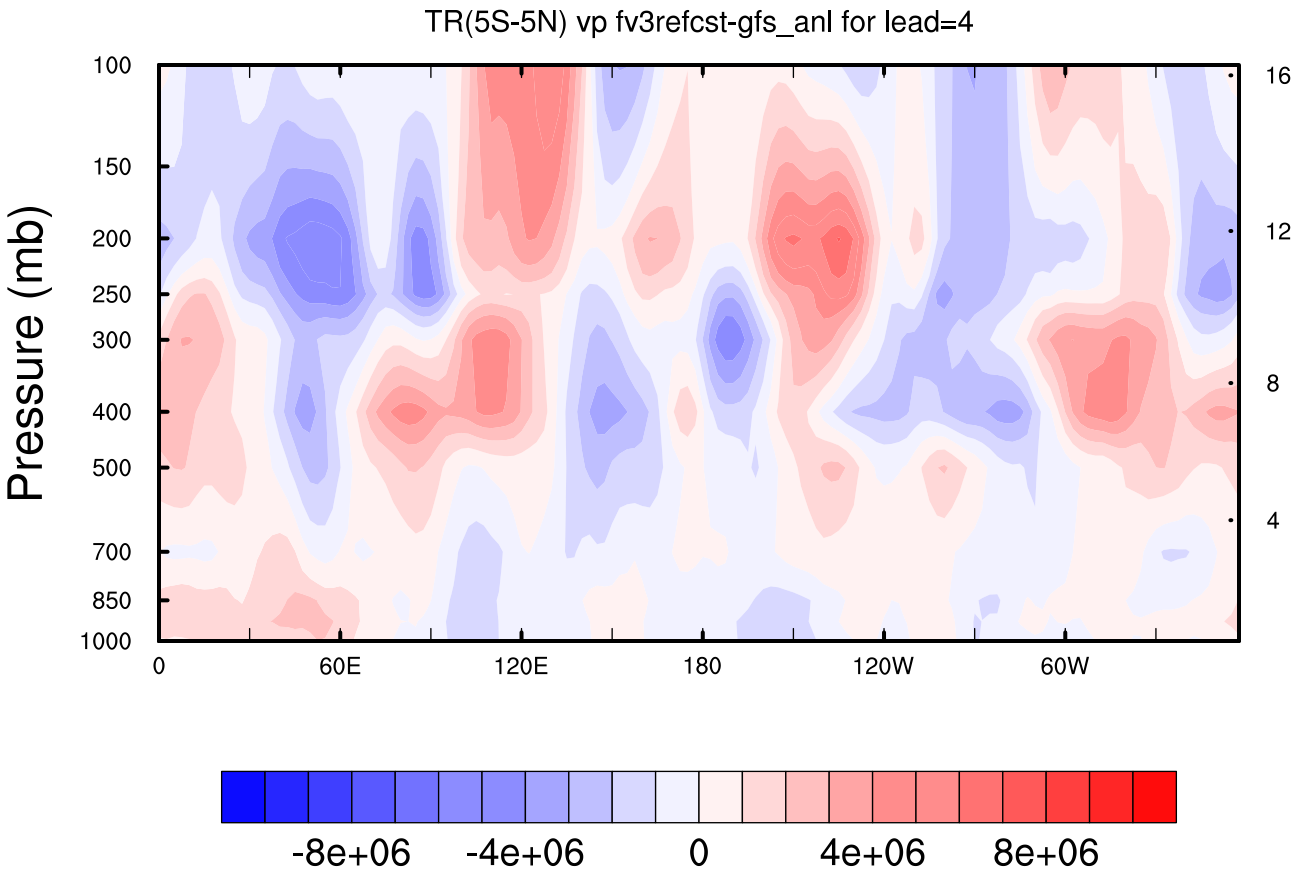
8e+06


TR(5S-5N) vp fv3refcst-gfs_anl for lead=4
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
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60W
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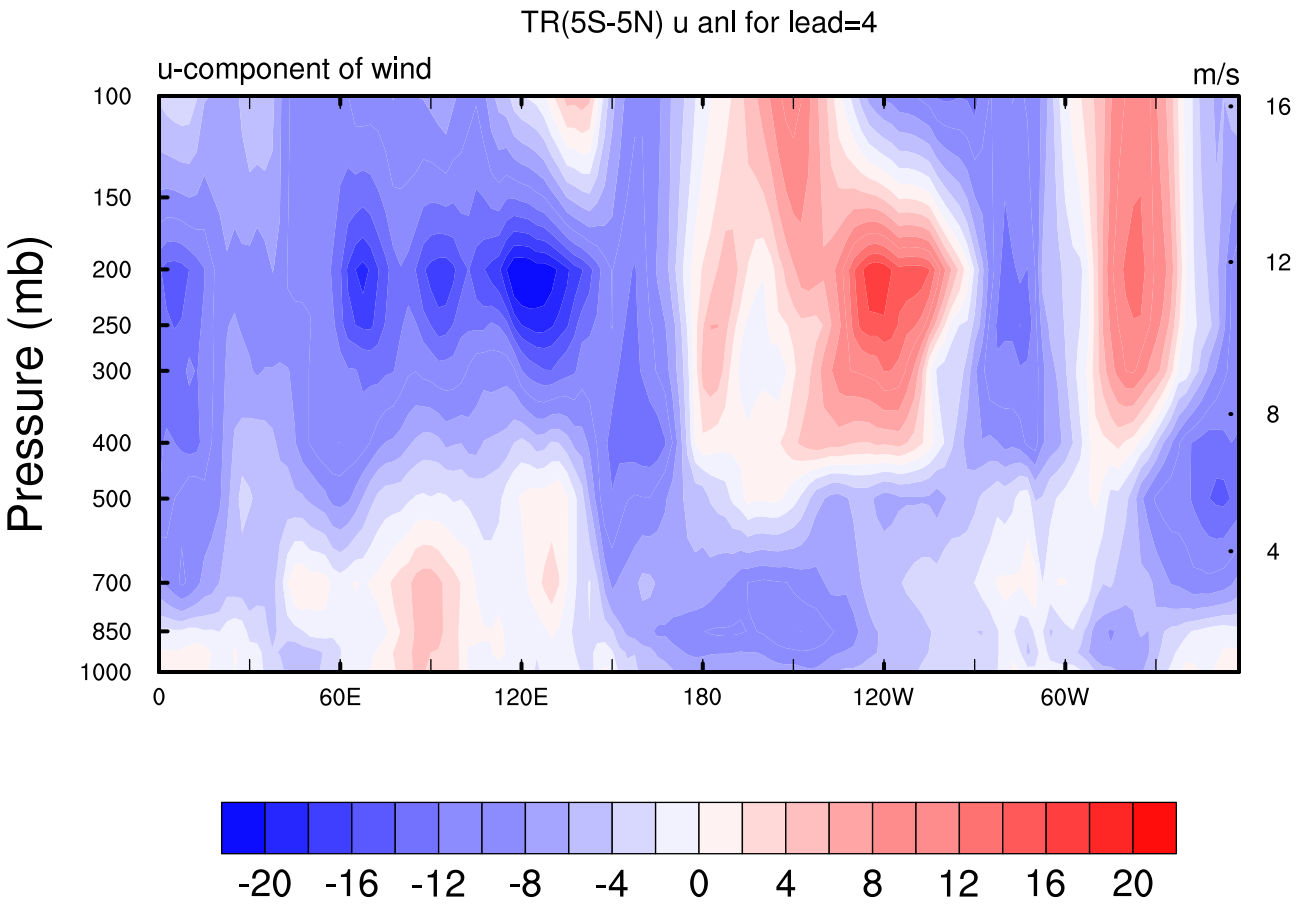
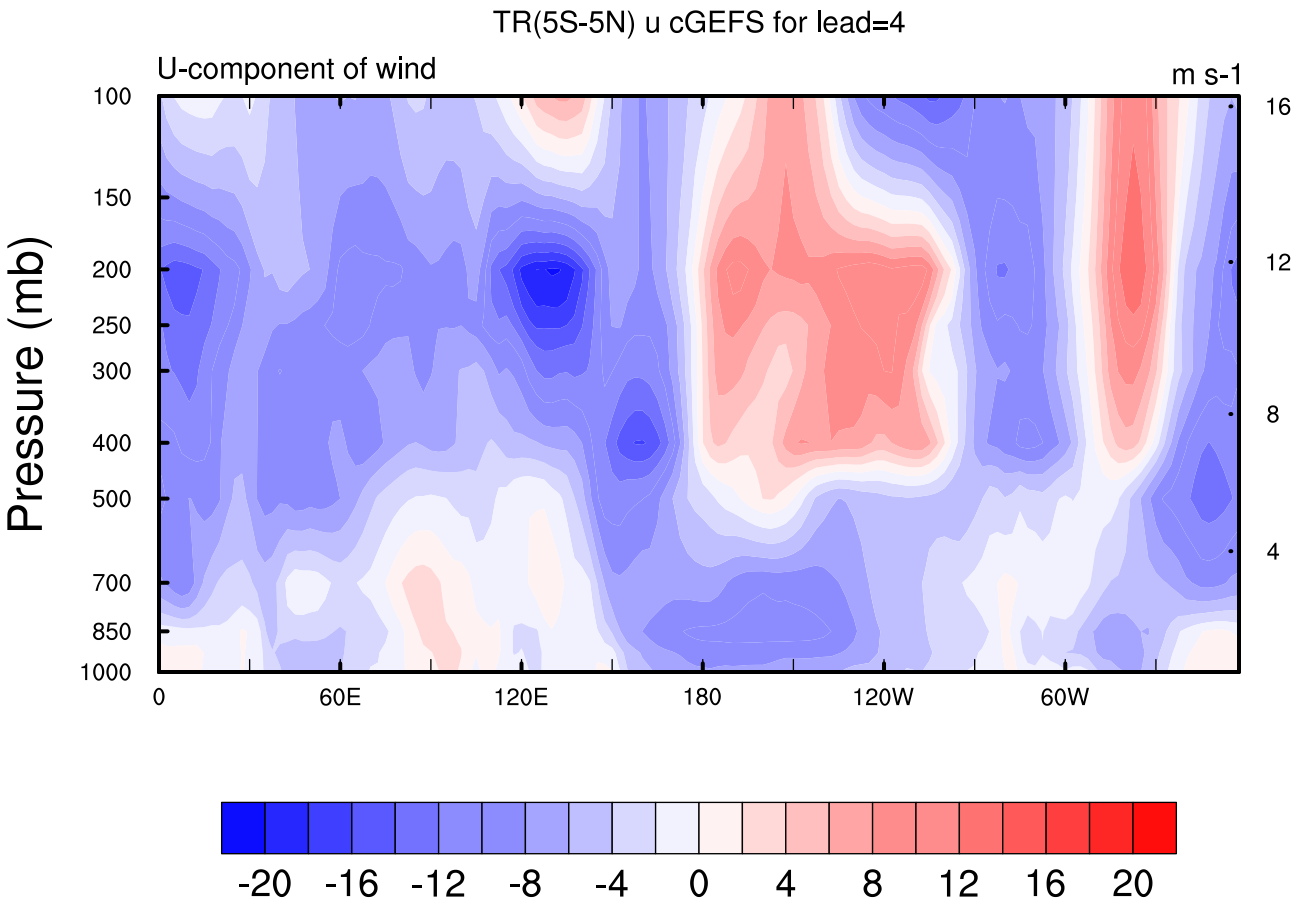
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) u anl for lead=4
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS for lead=4
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
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12
8
4
-20
-16
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-8
-4
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8
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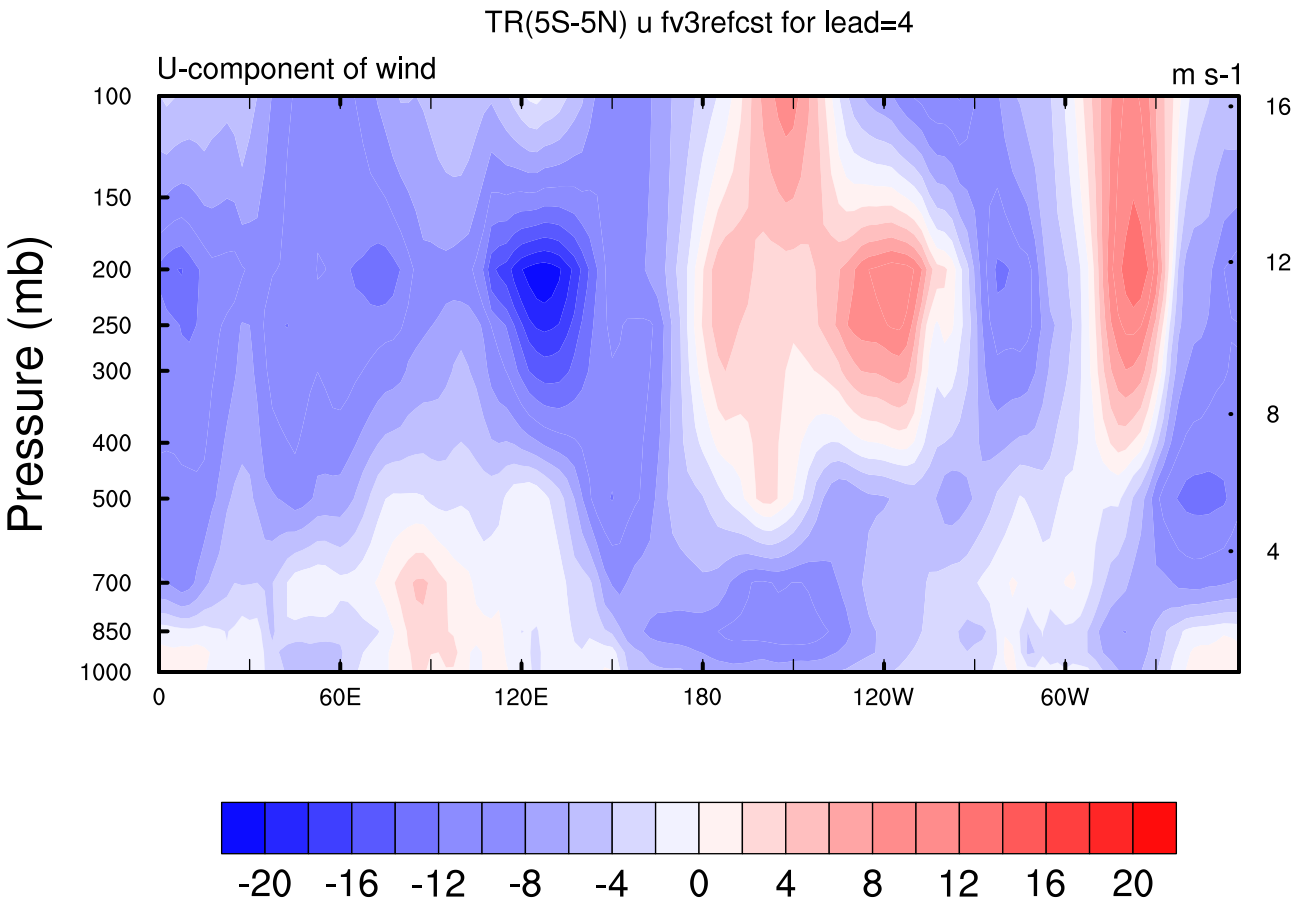
16
20


TR(5S-5N) u fv3refcst for lead=4
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
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-12
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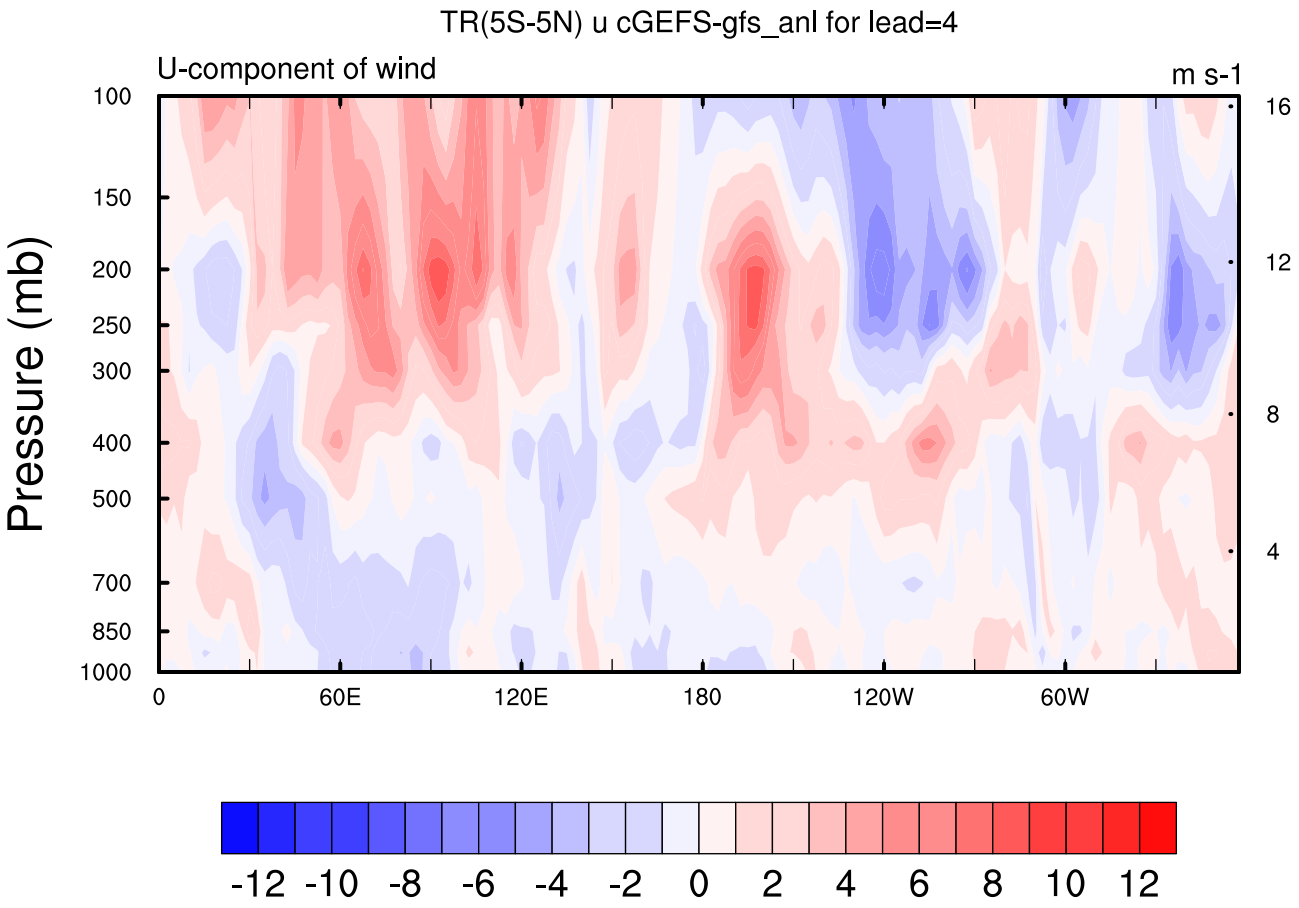
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=4
U-component of wind
m s-1
Pressure (mb)
100
150
200
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400
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700
850
1000
0
60E
120E
180
120W
60W
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-2
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10
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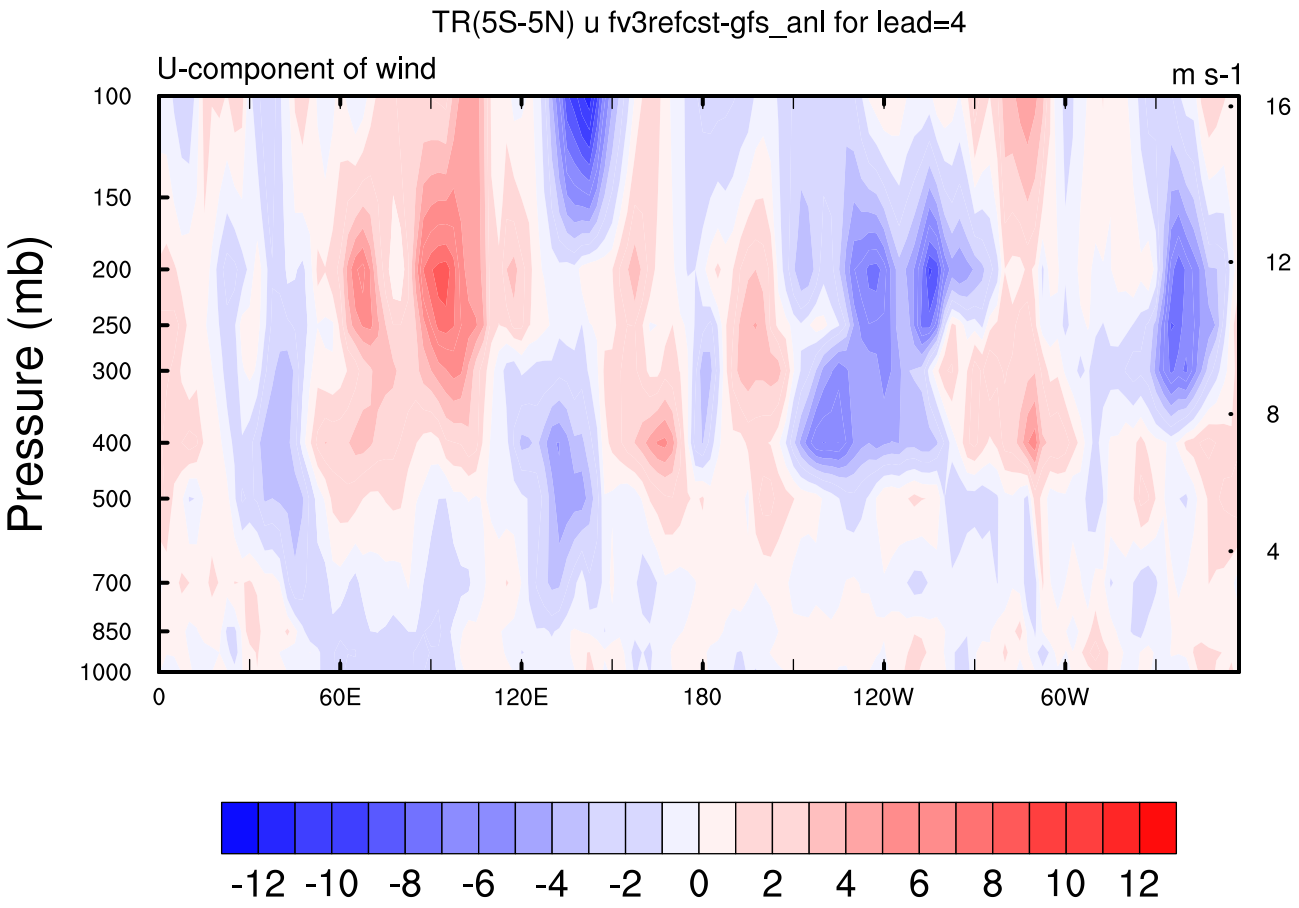
TR(5S-5N) u fv3refcst-gfs_anl for lead=4
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
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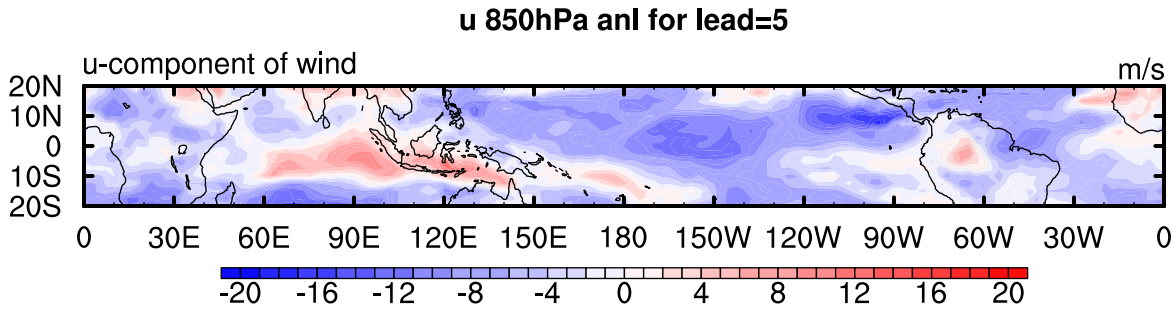
u 850hPa anl for lead=5
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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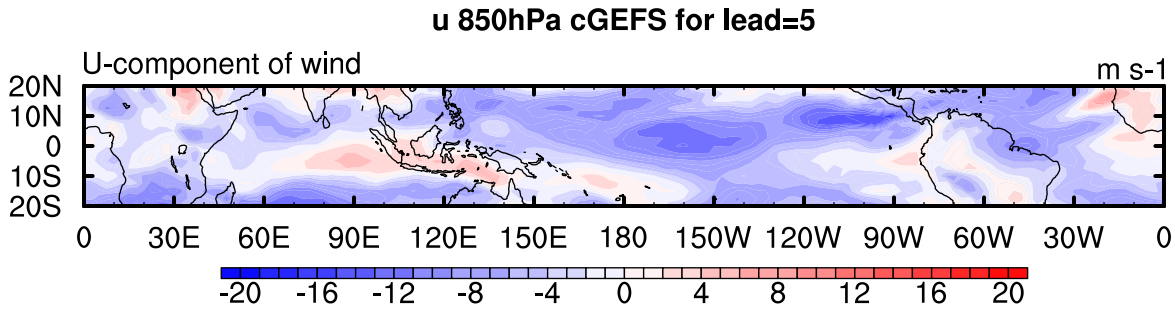
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS for lead=5
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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30W
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-4
0
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8
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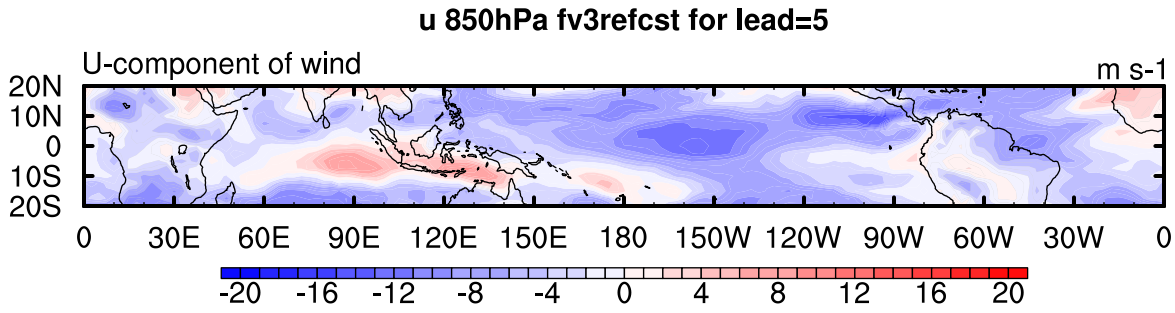
16
20


u 850hPa fv3refcst for lead=5
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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-4
0
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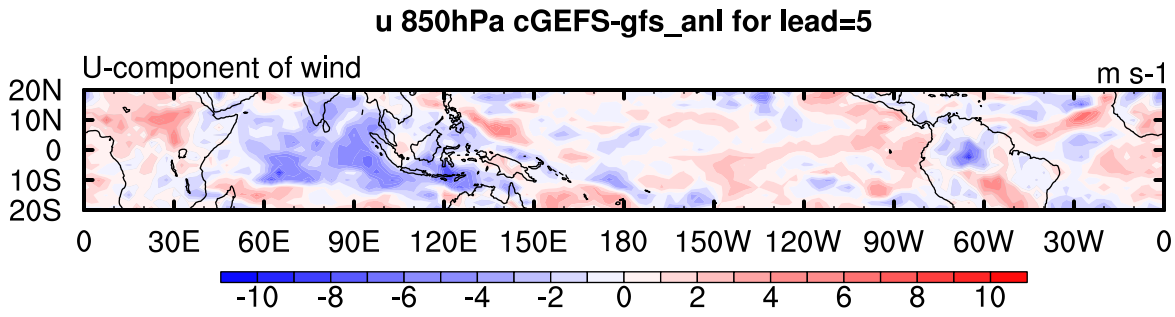
16
20


u 850hPa cGEFS-gfs_anl for lead=5
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-2
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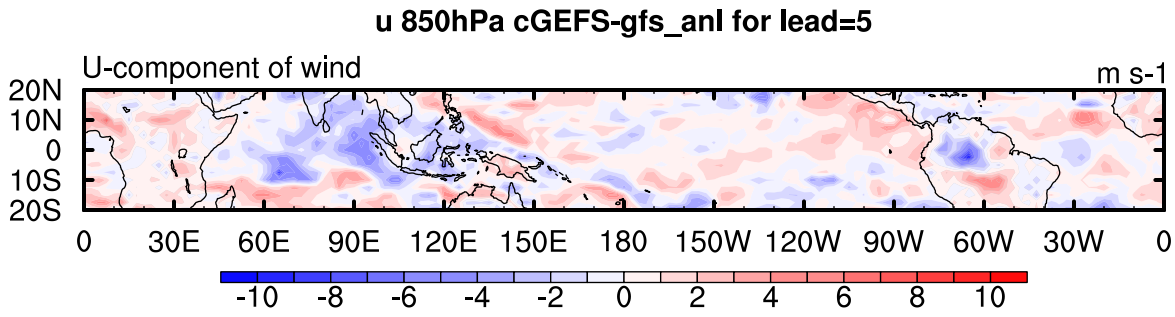
u 850hPa cGEFS-gfs_anl for lead=5
U-component of wind
m s-1
20N
10N
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10S
20S
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30E
60E
90E
120E
150E
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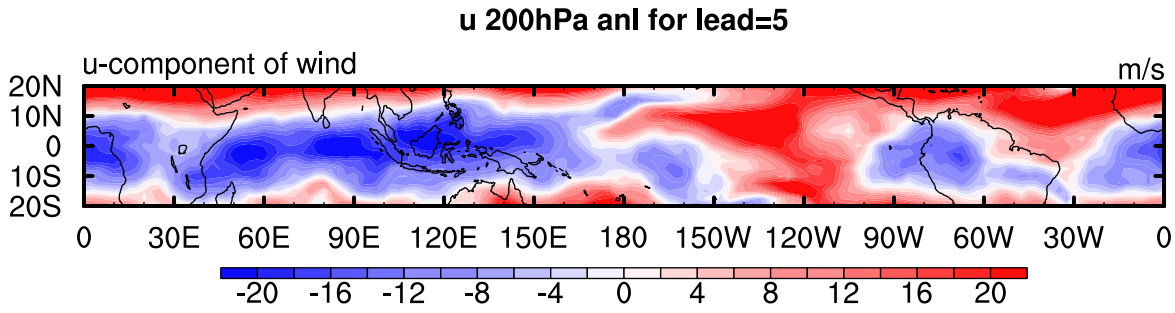
u 200hPa anl for lead=5
u-component of wind
m/s
20N
10N
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10S
20S
0
30E
60E
90E
120E
150E
180
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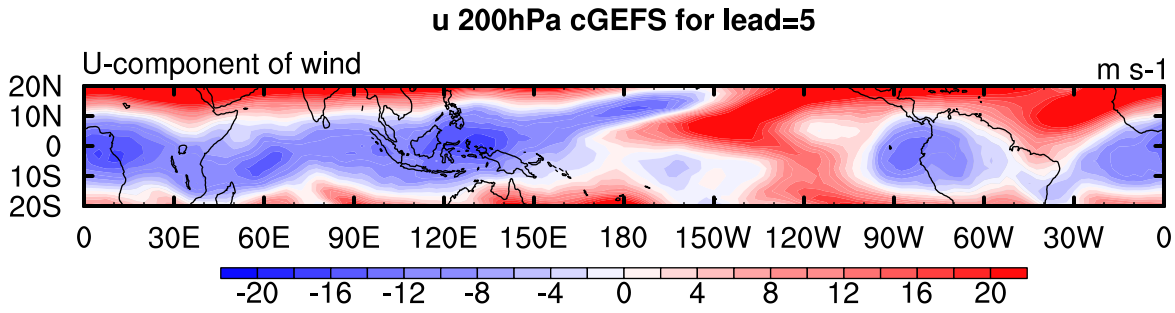
u 200hPa cGEFS for lead=5
U-component of wind
m s-1
20N
10N
0
10S
20S
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30E
60E
90E
120E
150E
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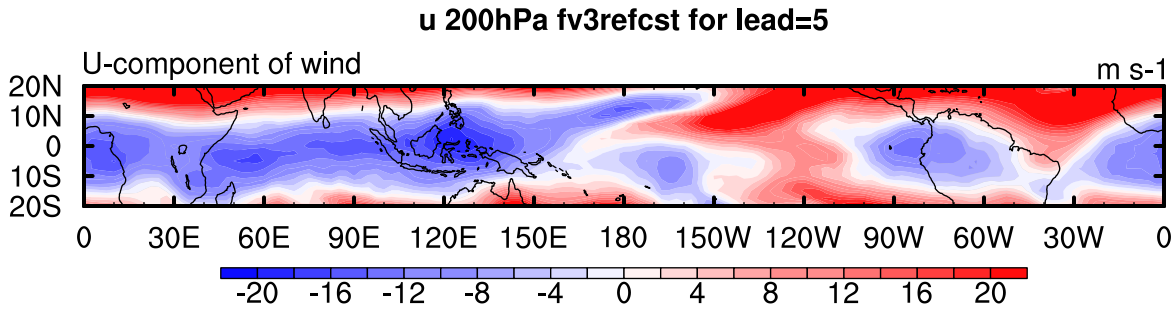
u 200hPa fv3refcst for lead=5
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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60W
30W
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8
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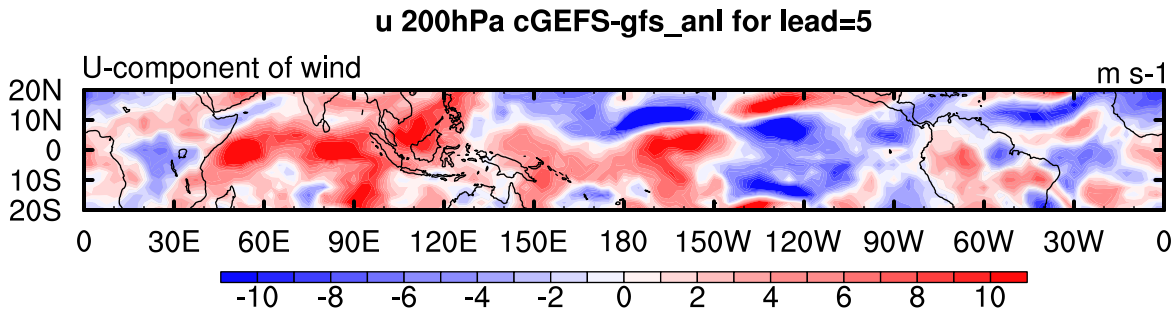
16
20


u 200hPa cGEFS-gfs_anl for lead=5
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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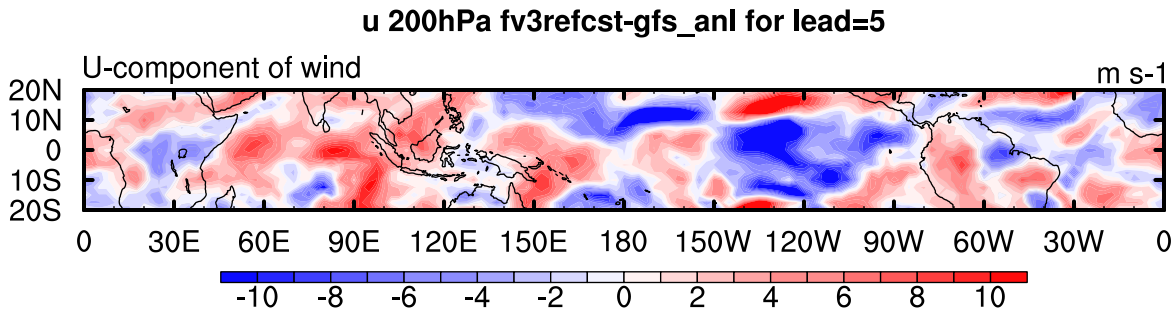
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U-component of wind
m s-1
20N
10N
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10S
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30E
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90E
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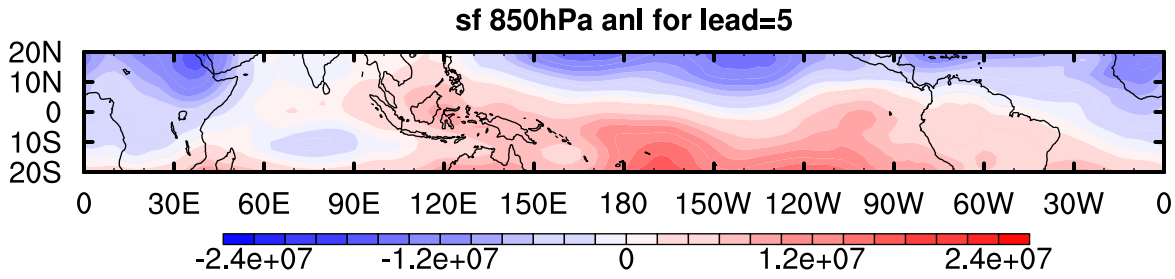
sf 850hPa anl for lead=5
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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60W
30W
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0
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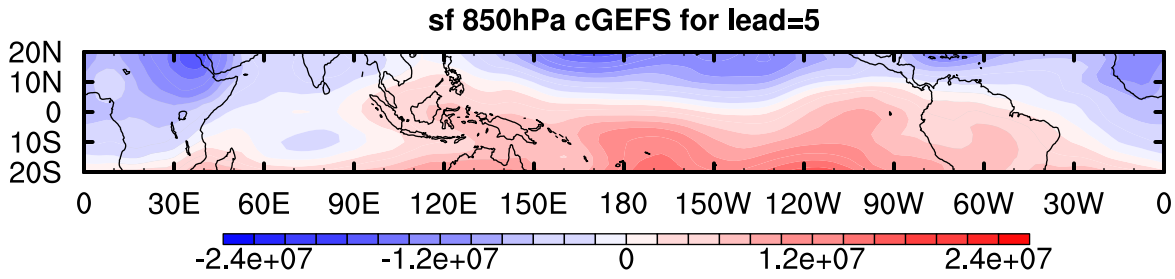
2.4e+07


sf 850hPa cGEFS for lead=5
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10N
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10S
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90E
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150E
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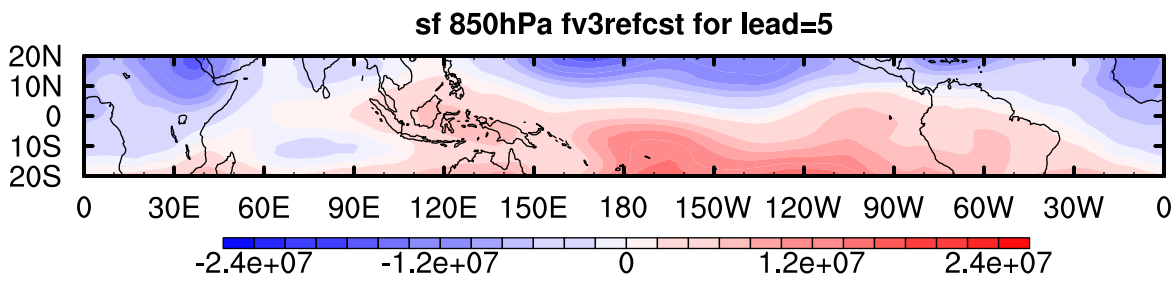
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=5
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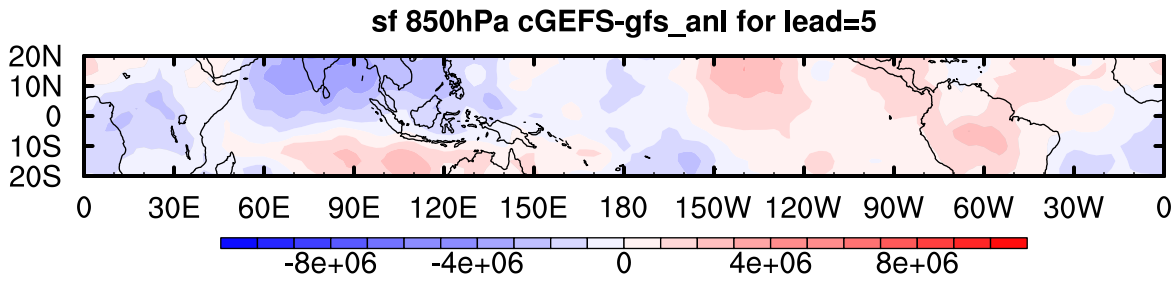
sf 850hPa cGEFS-gfs_anl for lead=5
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30E
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30W
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-4e+06
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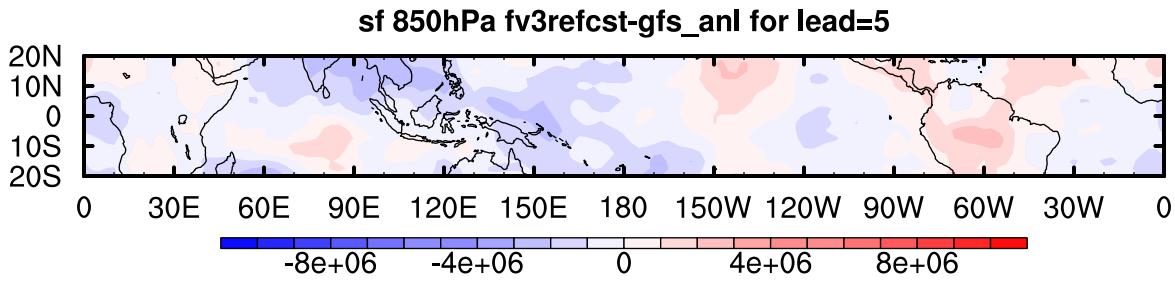
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=5
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30E
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-4e+06
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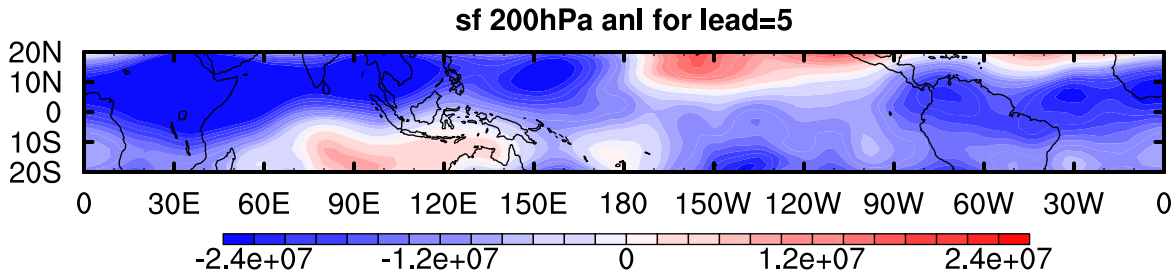
8e+06


sf 200hPa anl for lead=5
20N
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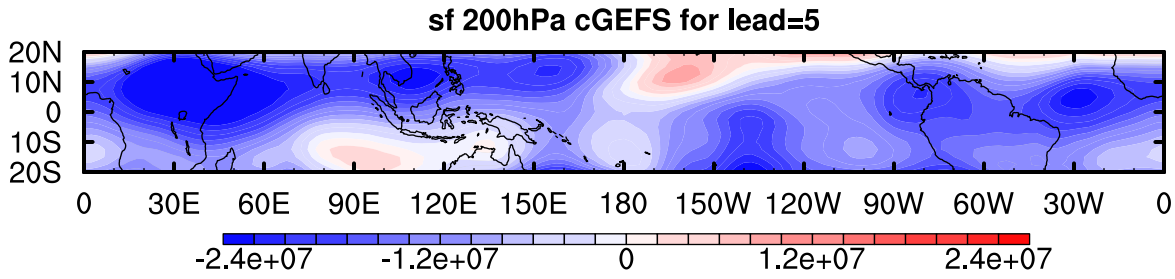
2.4e+07


sf 200hPa cGEFS for lead=5
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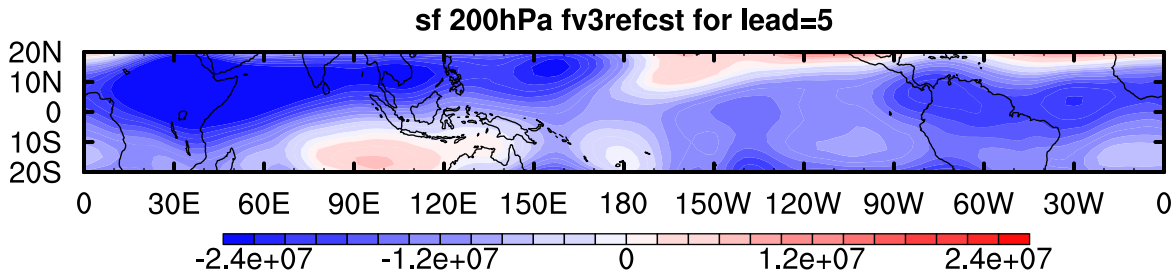
sf 200hPa fv3refcst for lead=5
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30W
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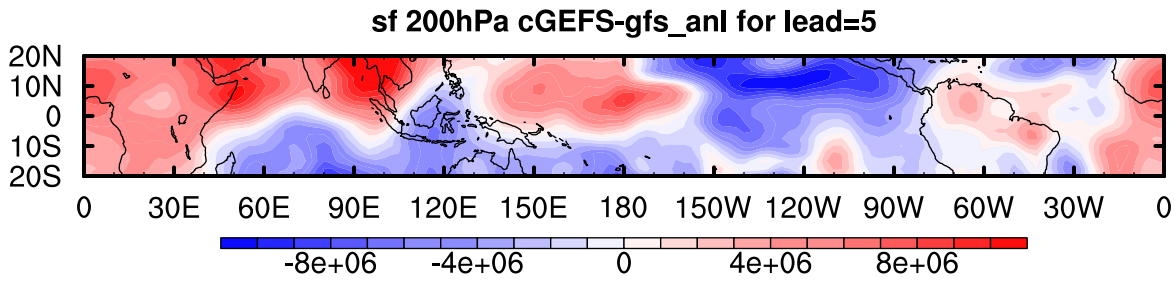
1.2e+07
2.4e+07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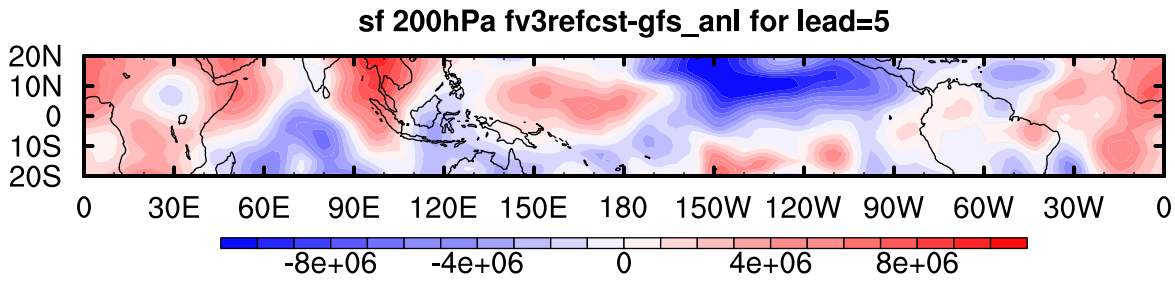
sf 200hPa fv3refcst-gfs_anl for lead=5
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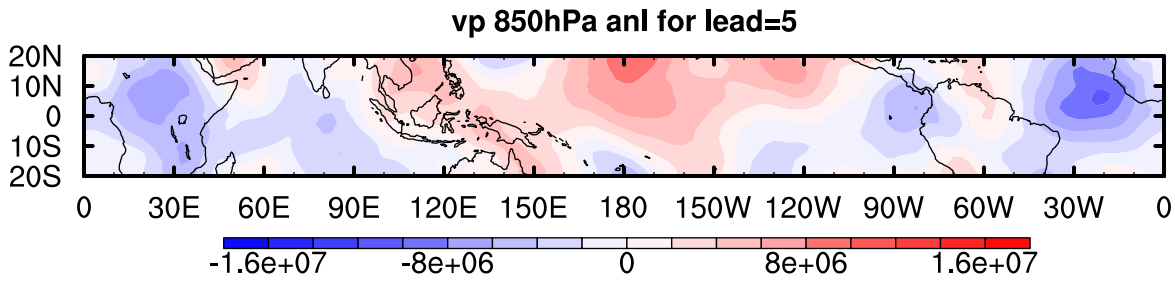
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30W
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-8e+06
0
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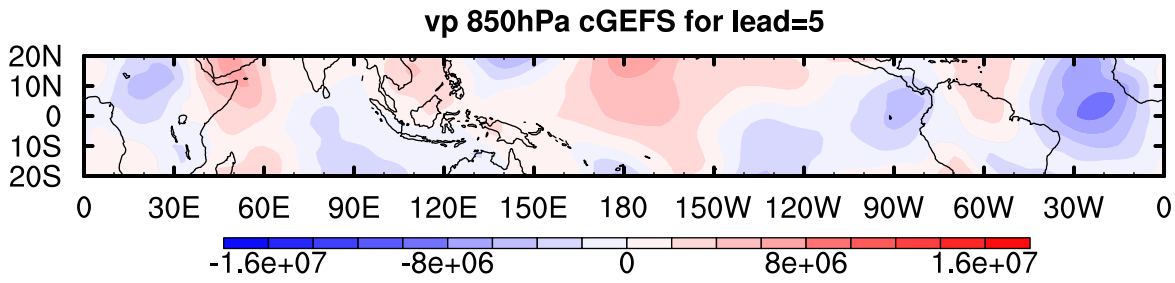
1.6e+07


vp 850hPa cGEFS for lead=5
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-1.6e+07
-8e+06
0
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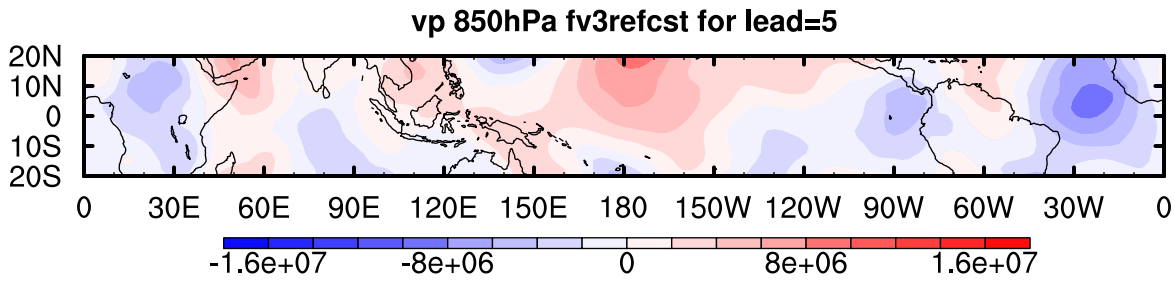
1.6e+07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10S
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90E
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30W
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-1.6e+07
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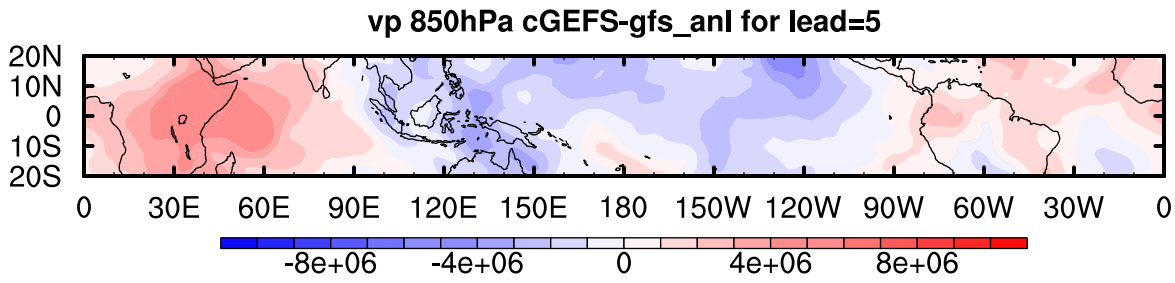
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=5
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10S
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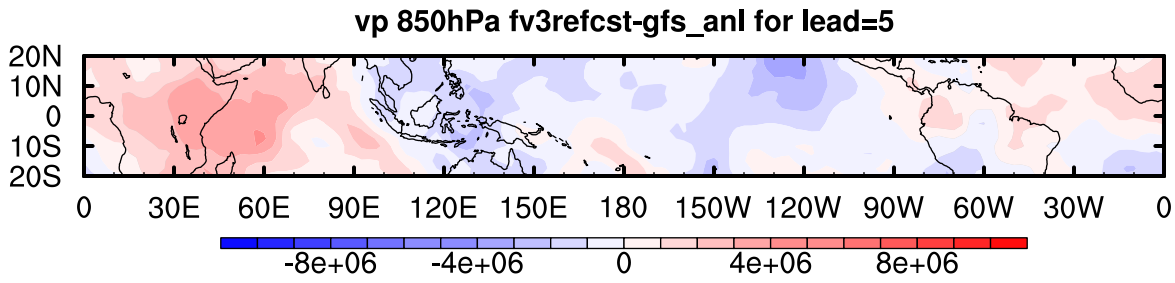
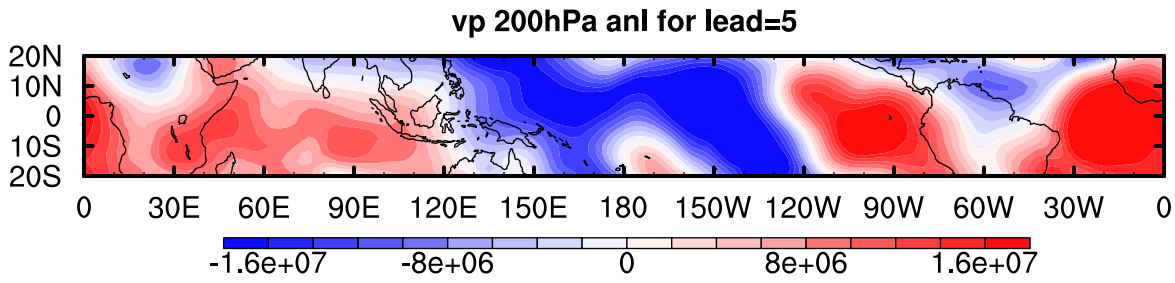
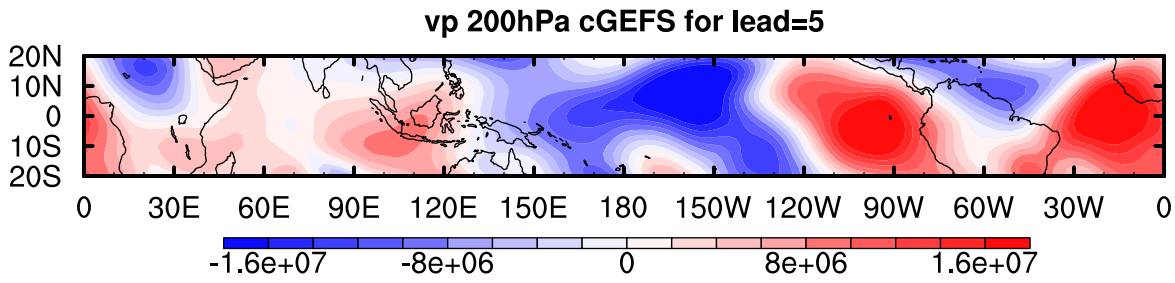
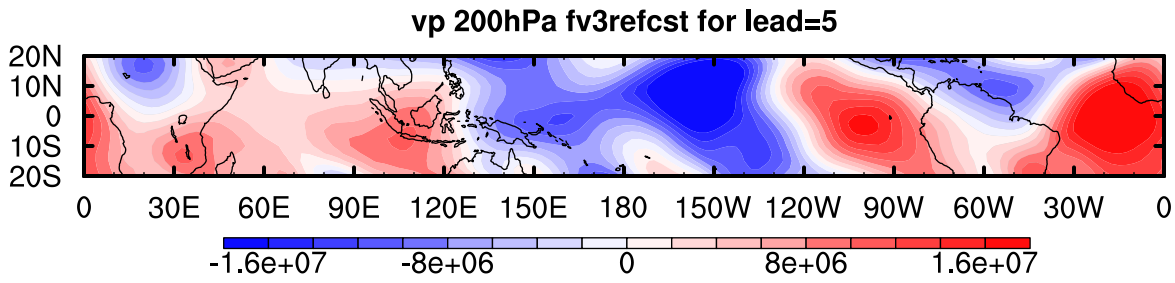
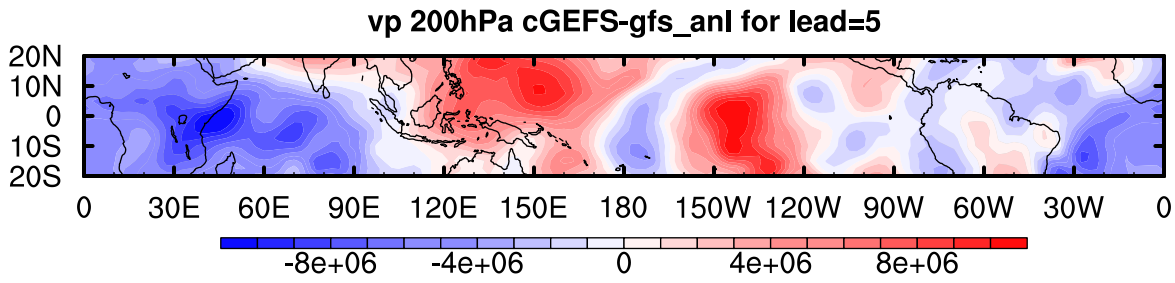
4e+06
8e+06

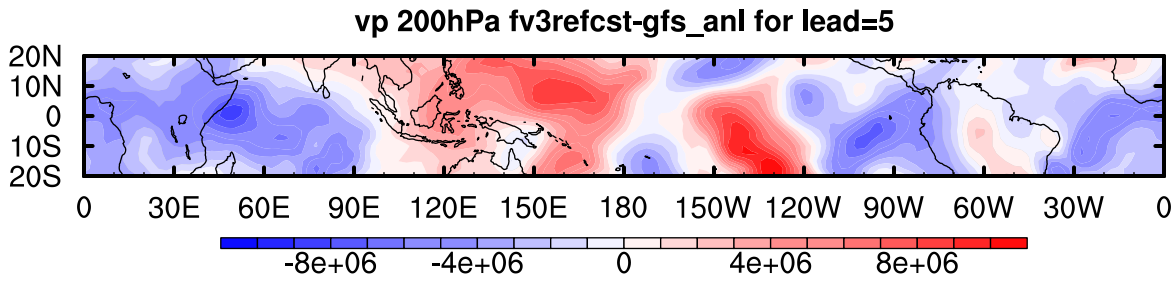

vp 850hPa fv3refcst-gfs_anl for lead=5
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

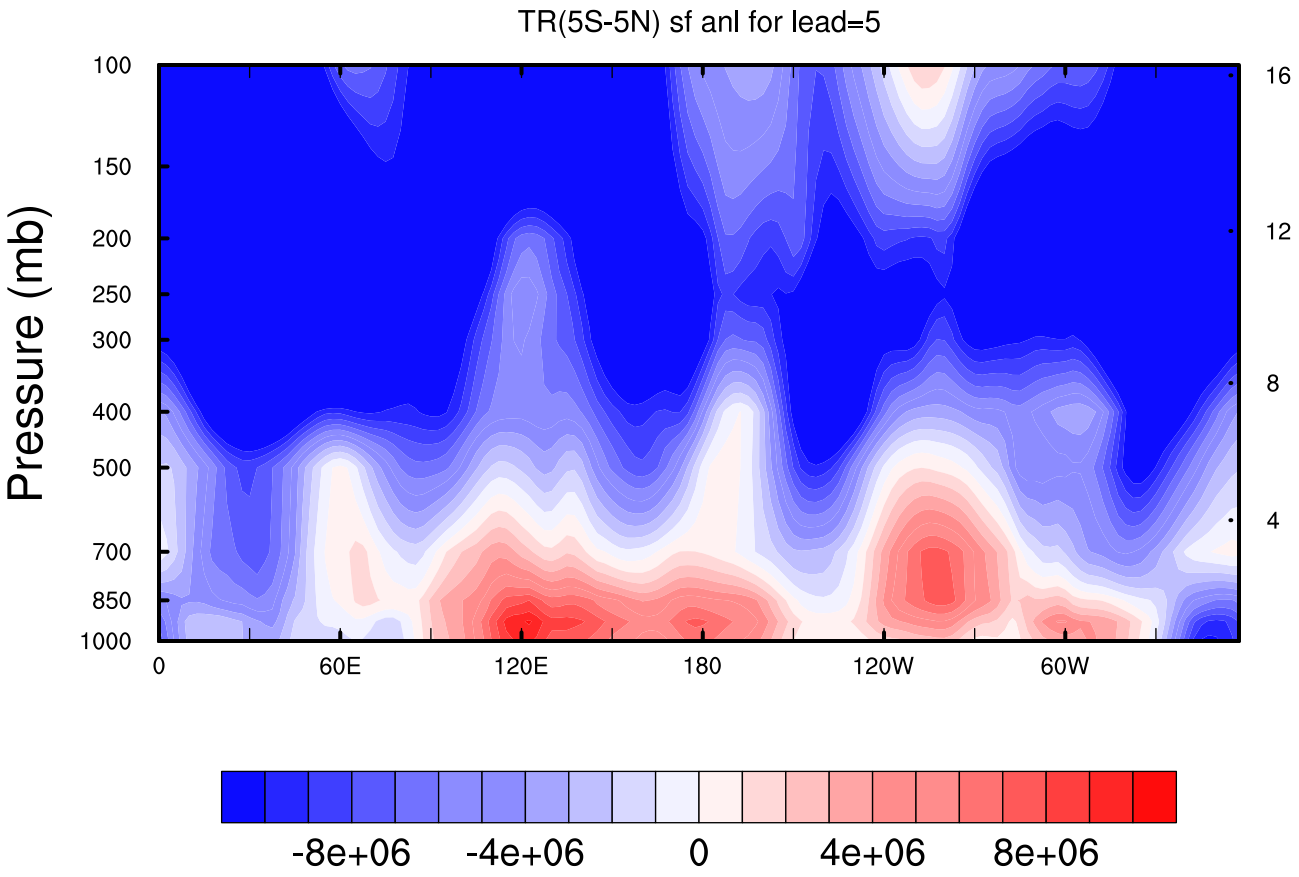

vp 200hPa anl for lead=5
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

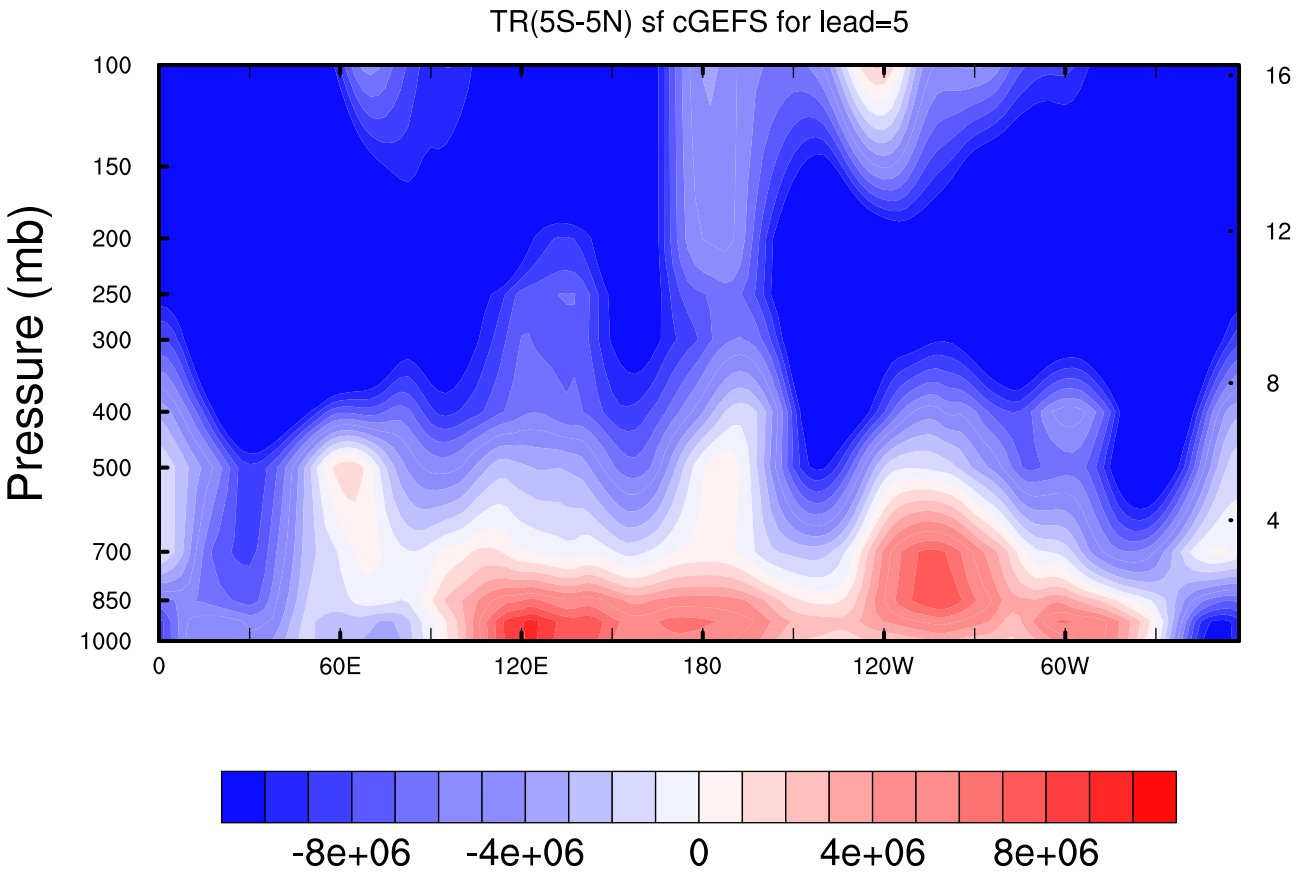

vp 200hPa cGEFS for lead=5
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

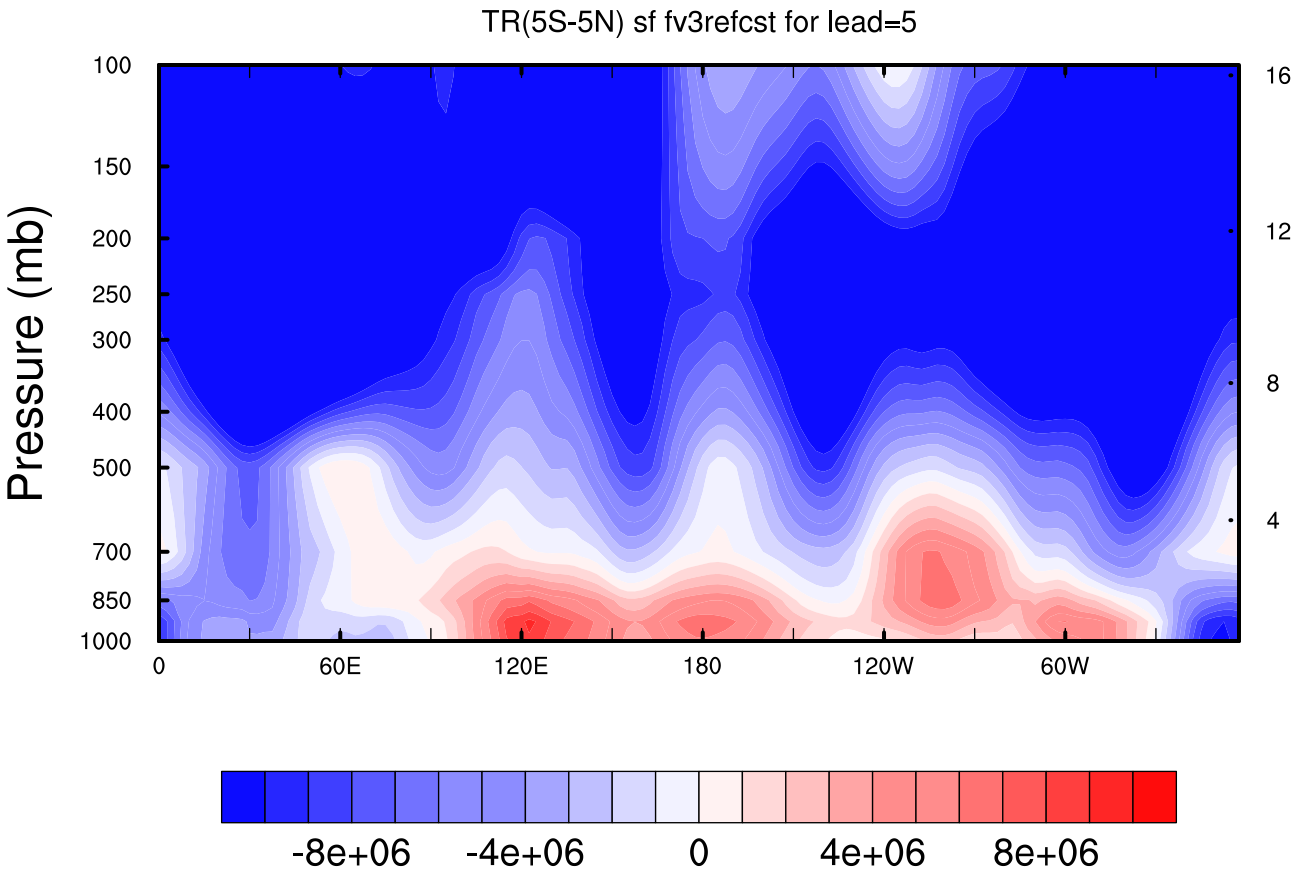

vp 200hPa fv3refcst for lead=5
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

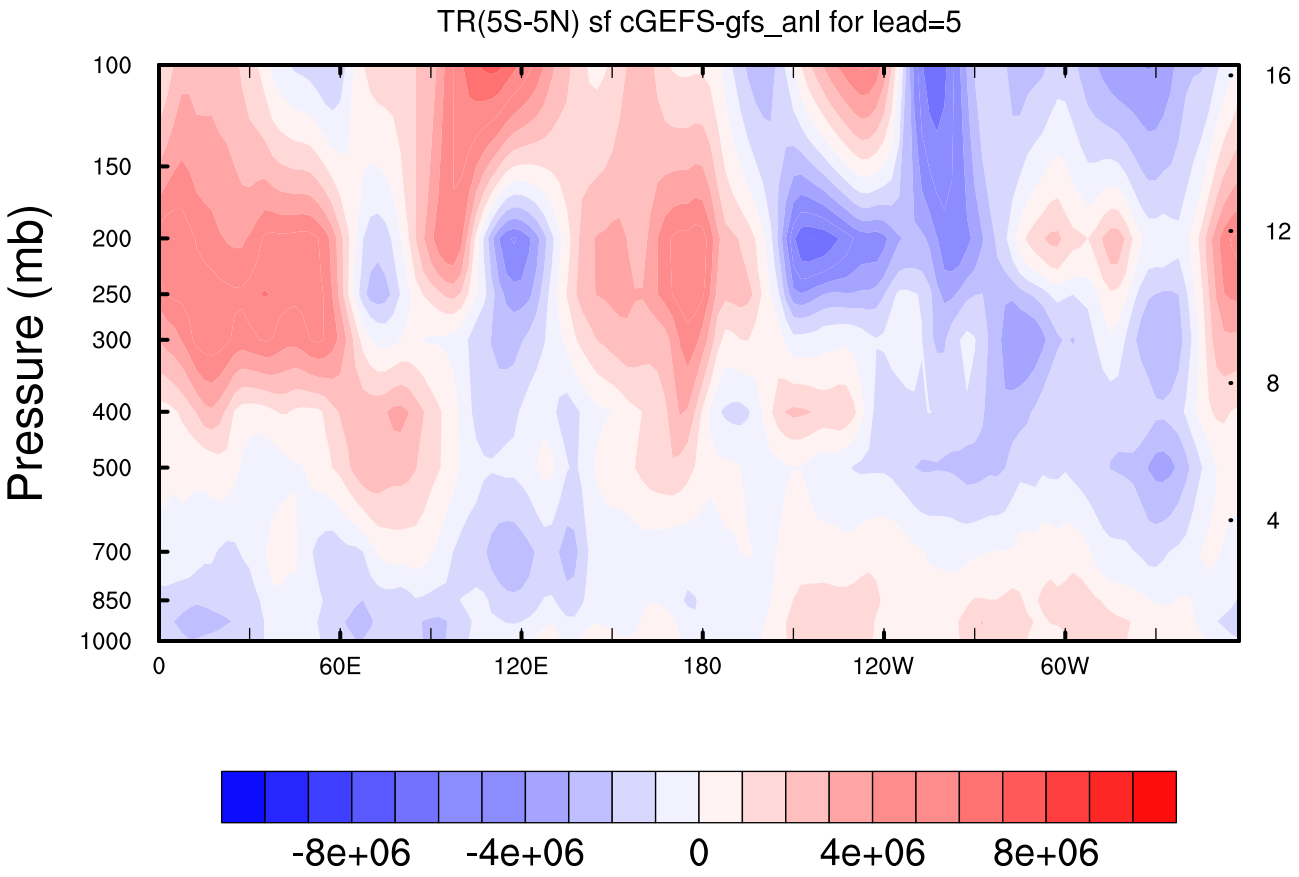

vp 200hPa cGEFS-gfs_anl for lead=5
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

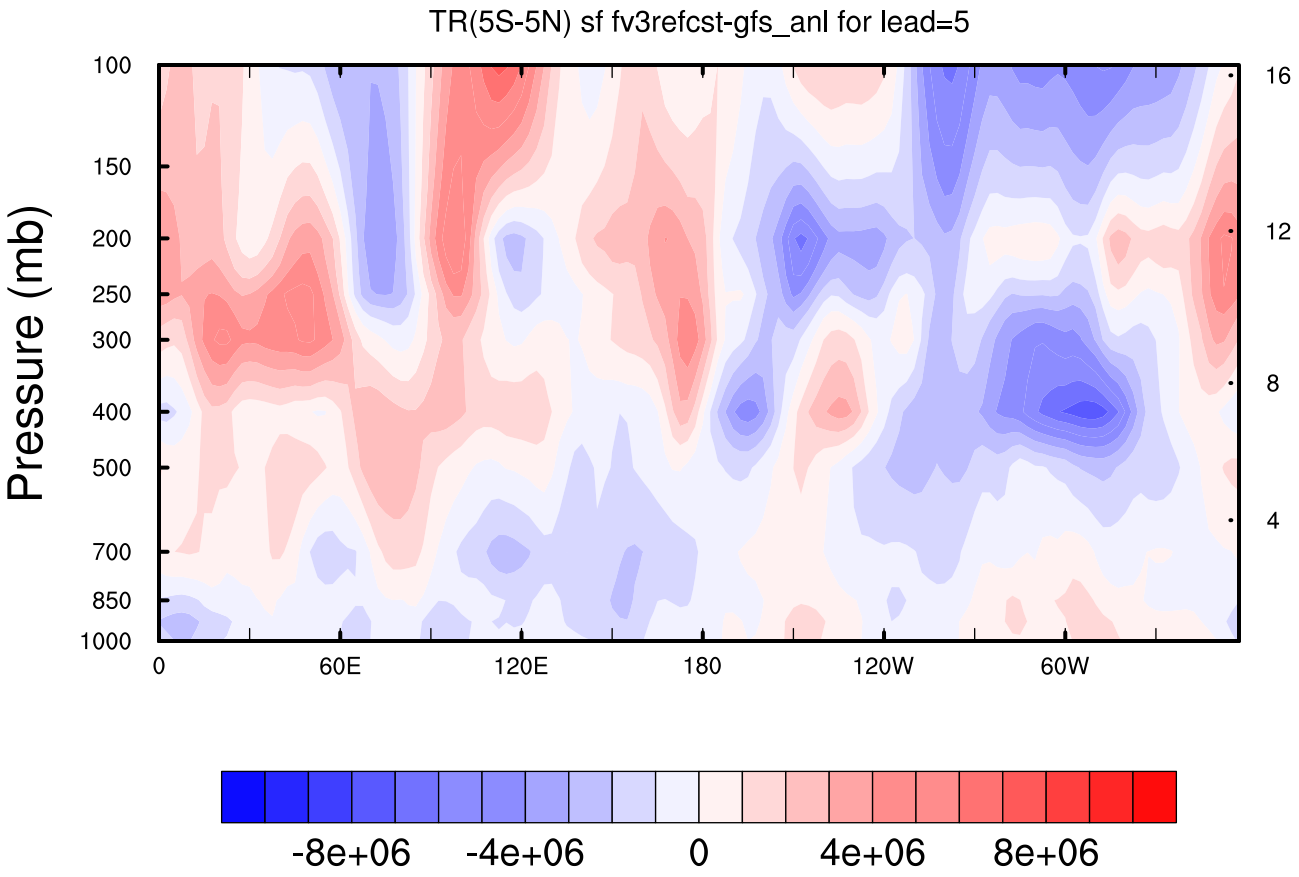

vp 200hPa fv3refcst-gfs_anl for lead=5
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

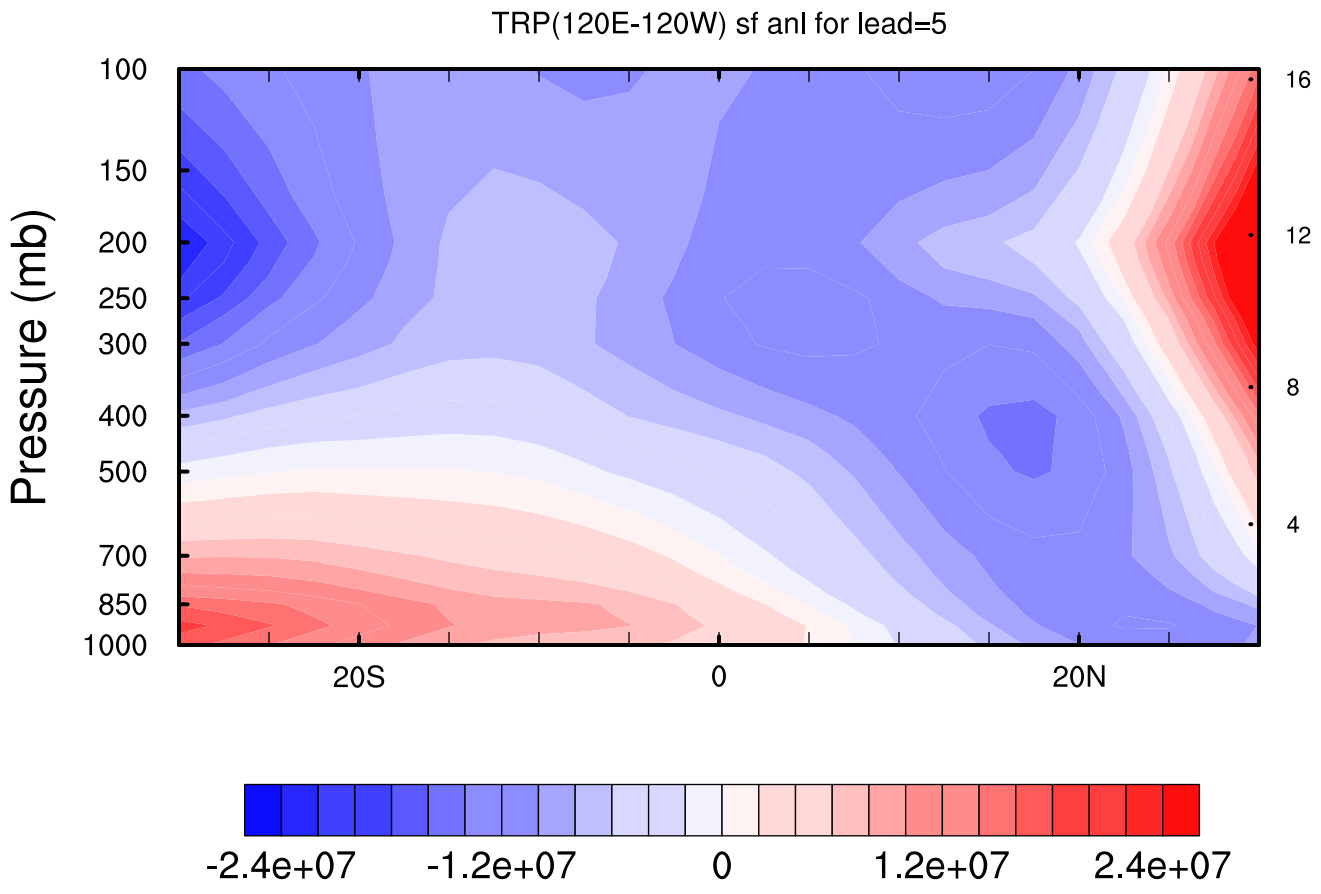

TR(5S-5N) sf anl for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

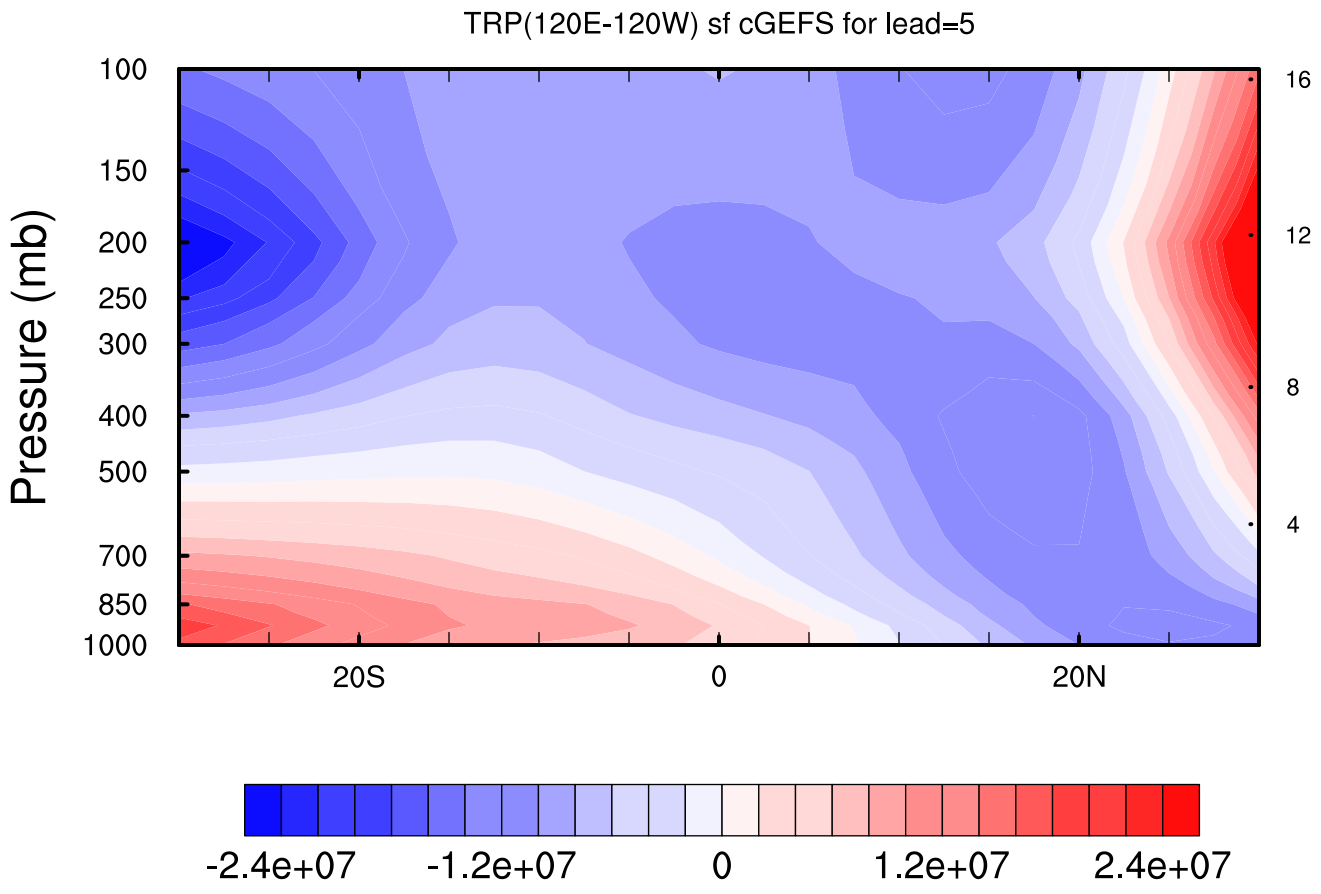

TR(5S-5N) sf cGEFS for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

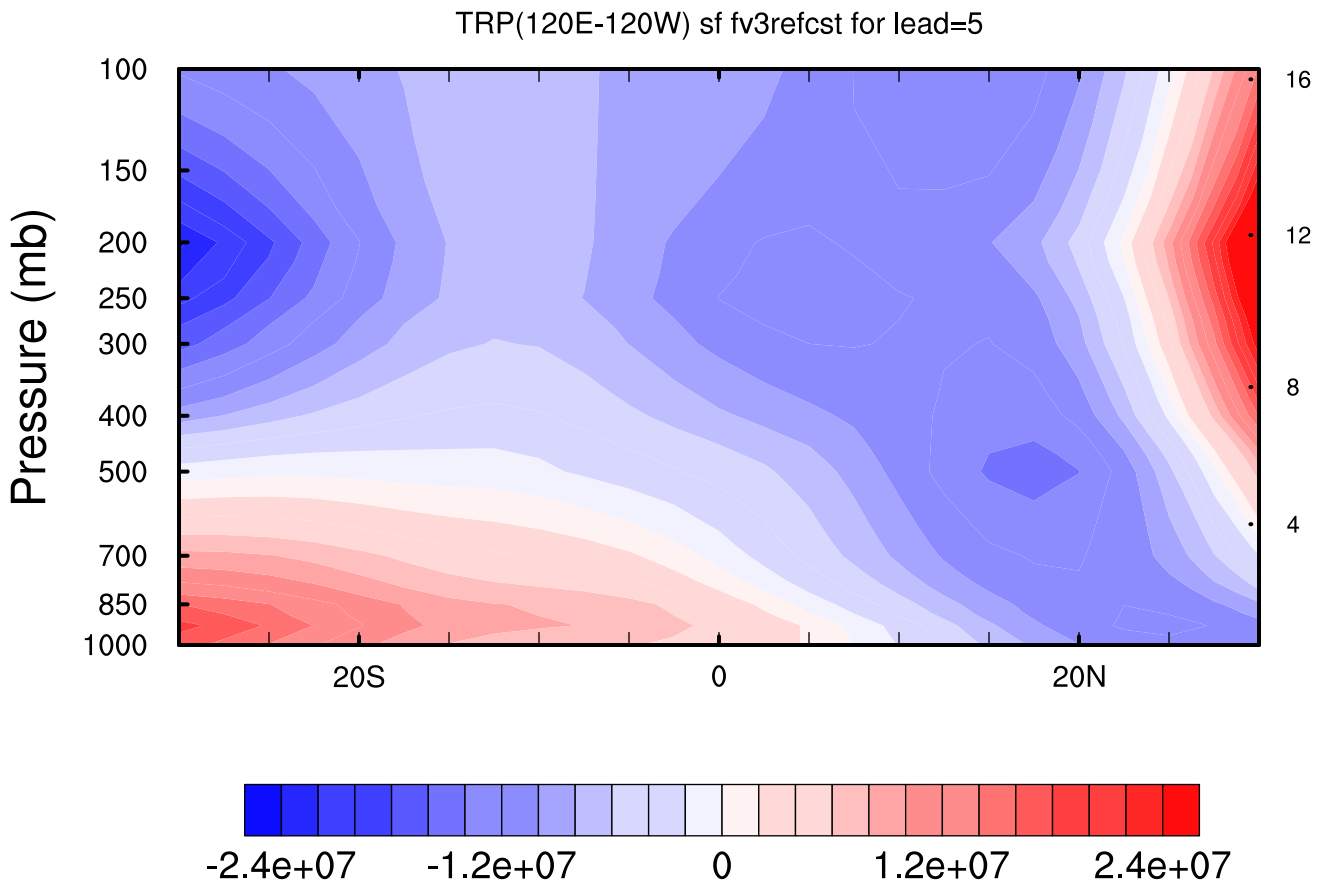

TR(5S-5N) sf fv3refcst for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

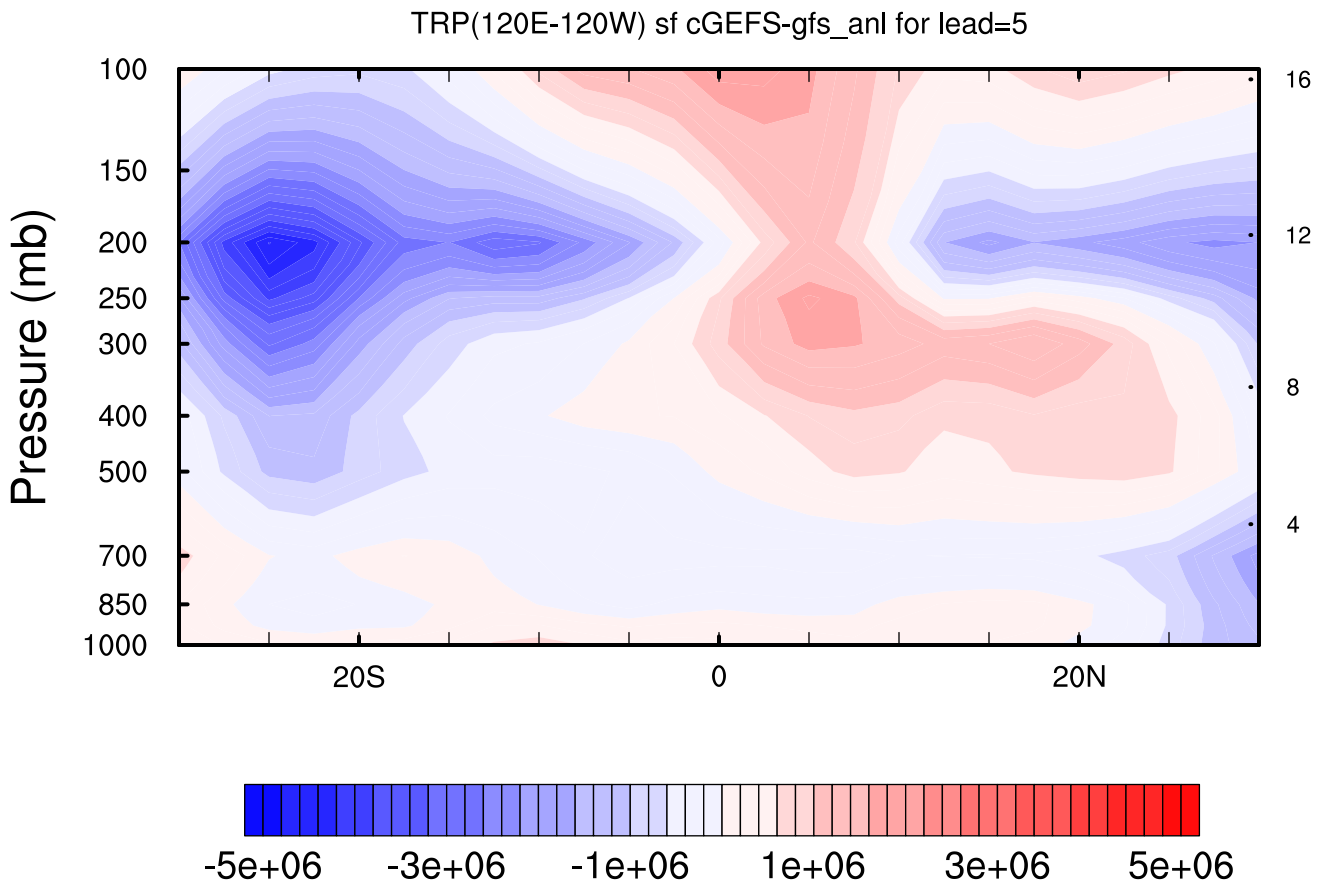

TR(5S-5N) sf cGEFS-gfs_anl for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

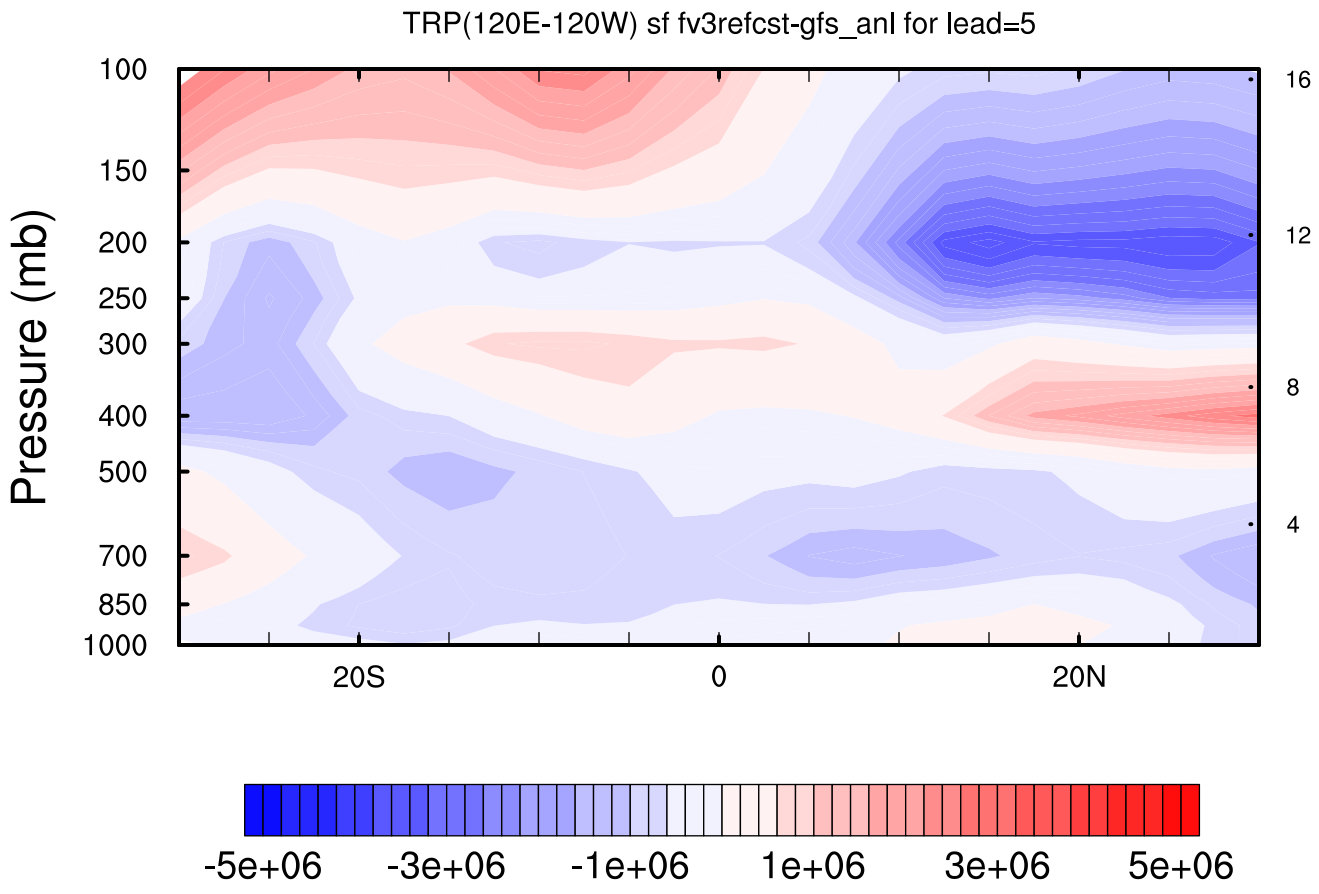

TR(5S-5N) sf fv3refcst-gfs_anl for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

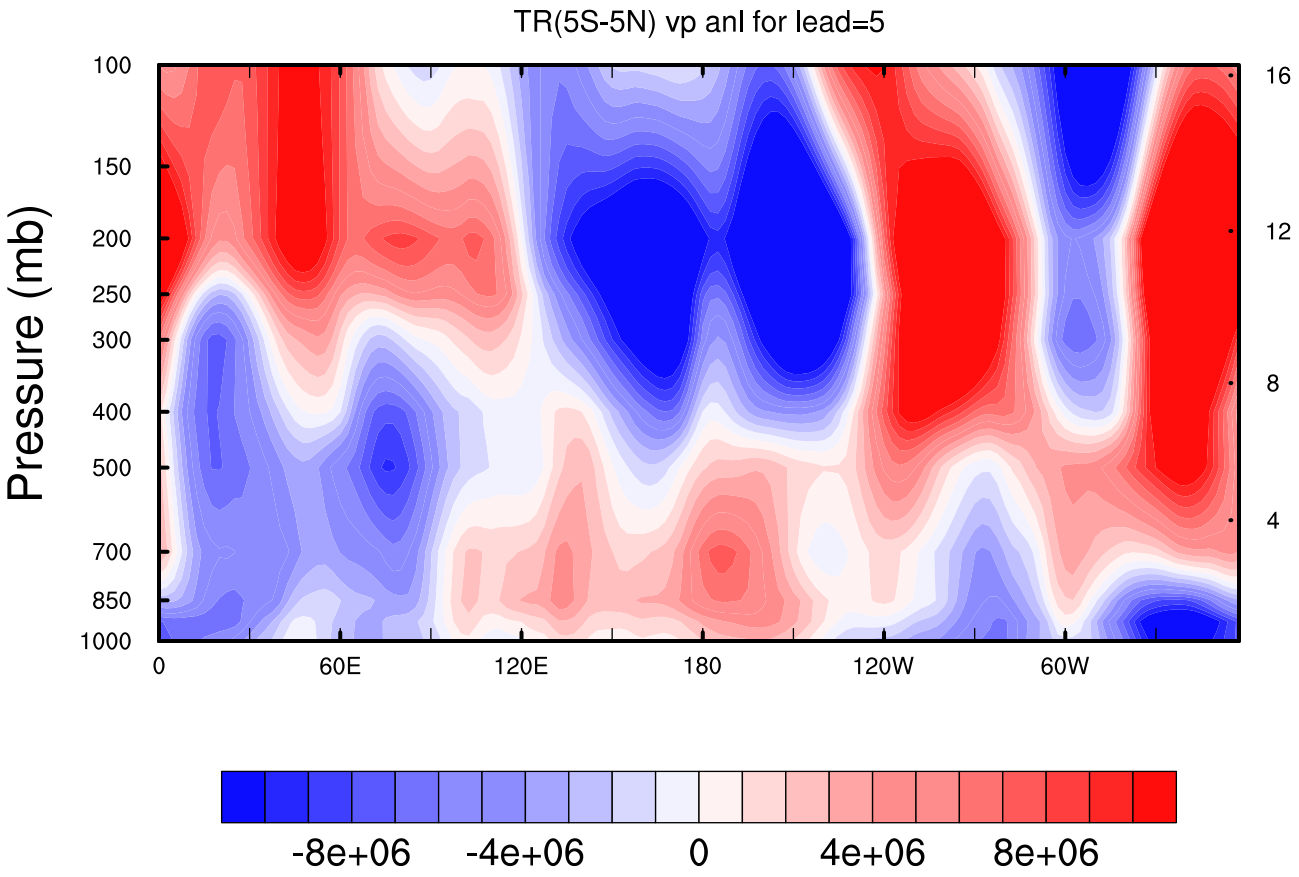

TRP(120E-120W) sf anl for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

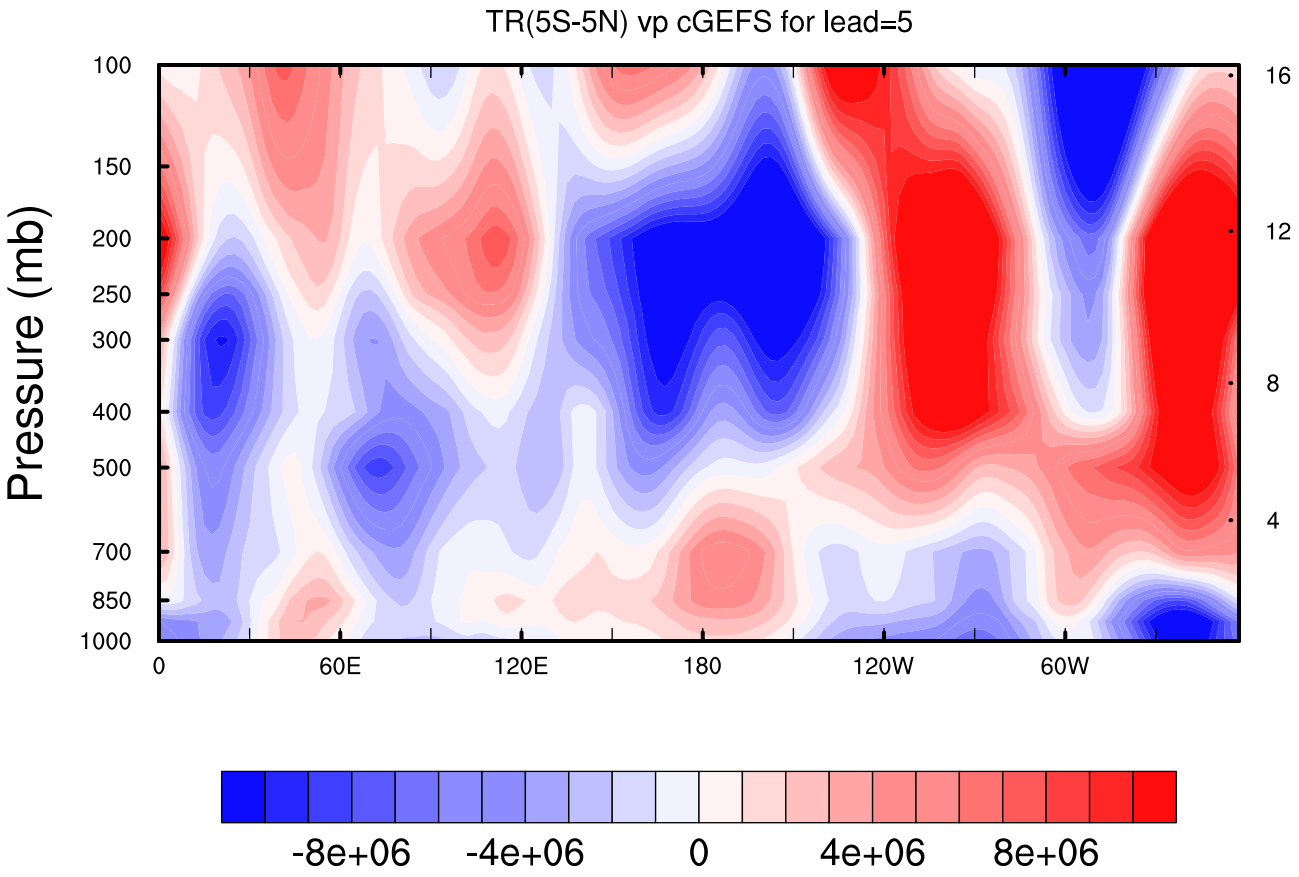

TRP(120E-120W) sf cGEFS for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

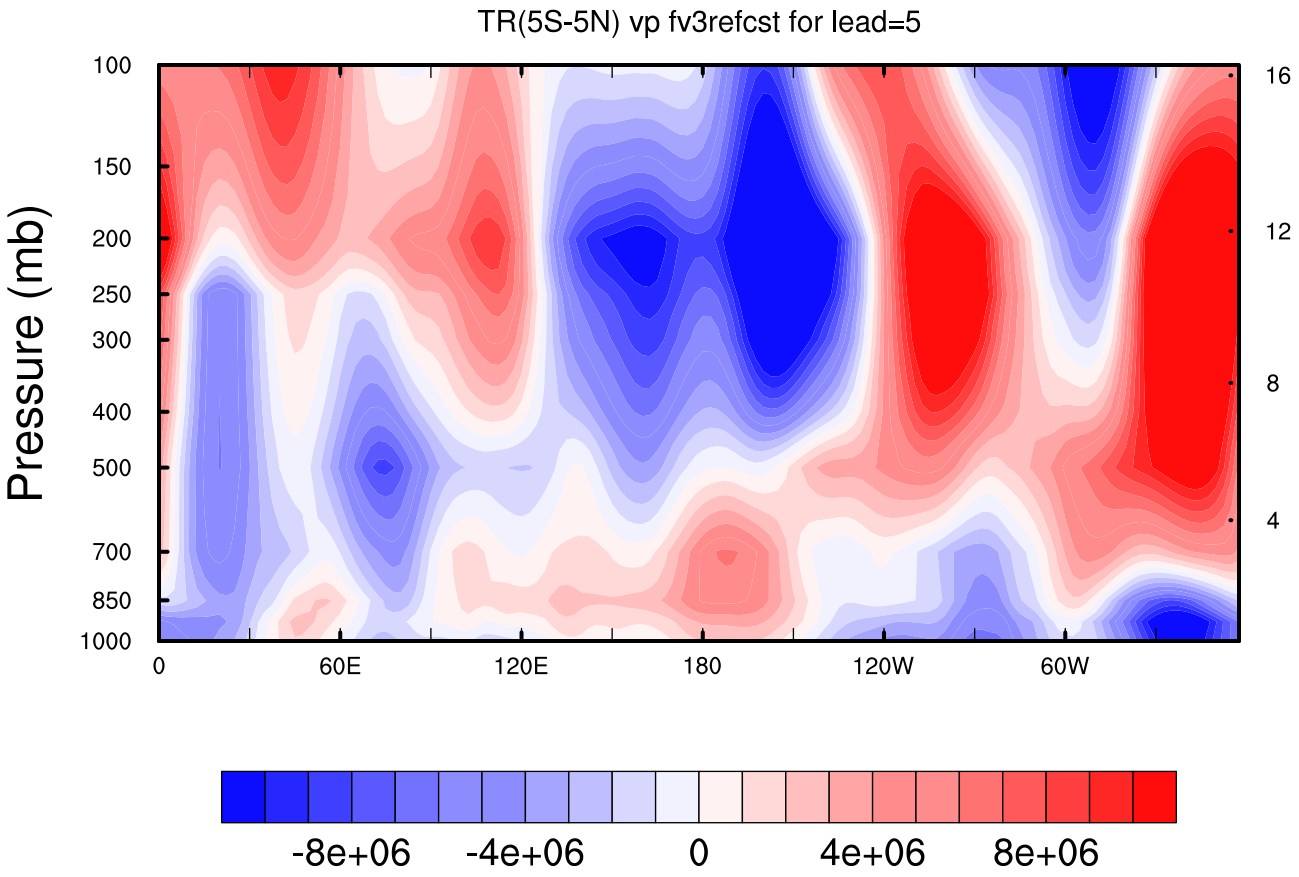

TRP(120E-120W) sf fv3refcst for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

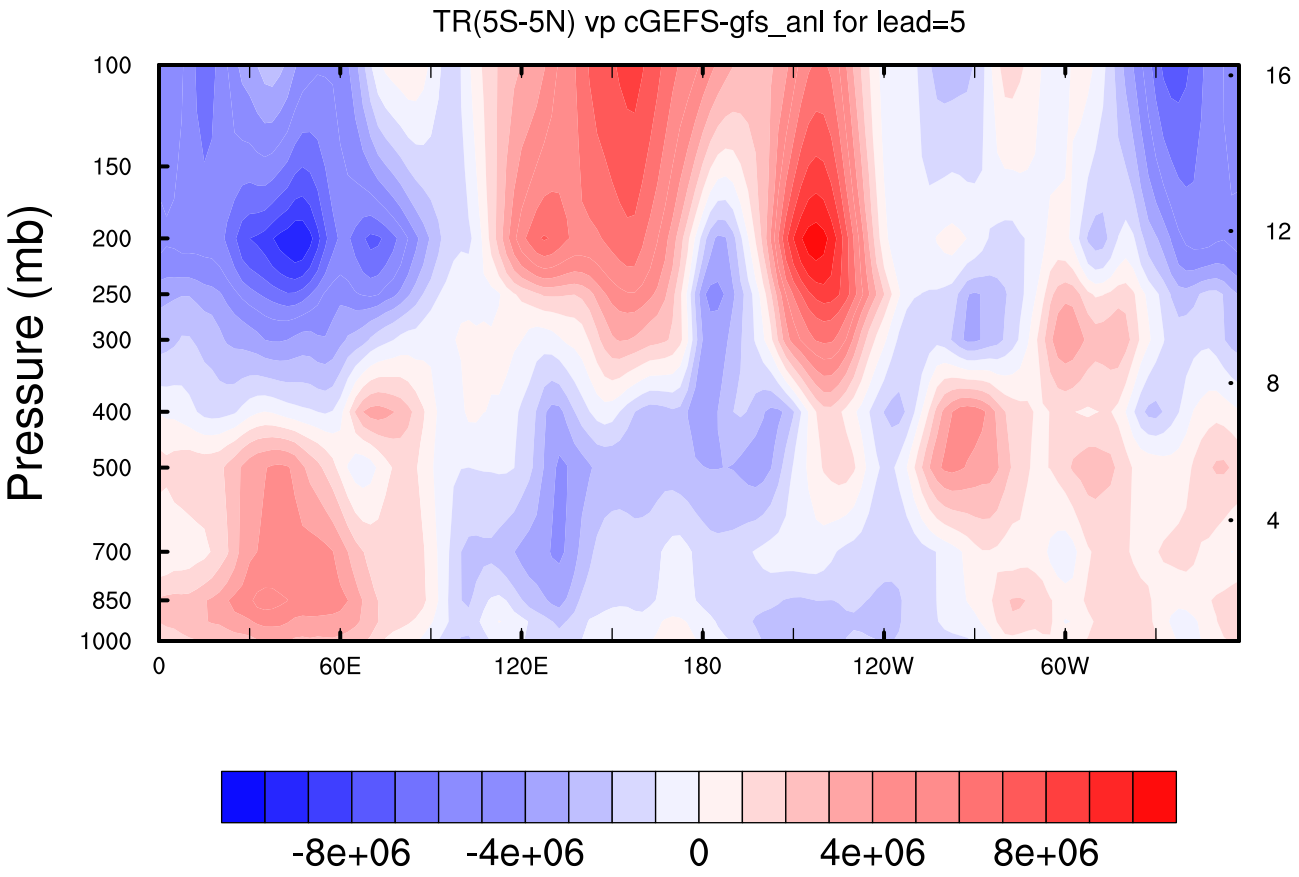

TRP(120E-120W) sf cGEFS-gfs_anl for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

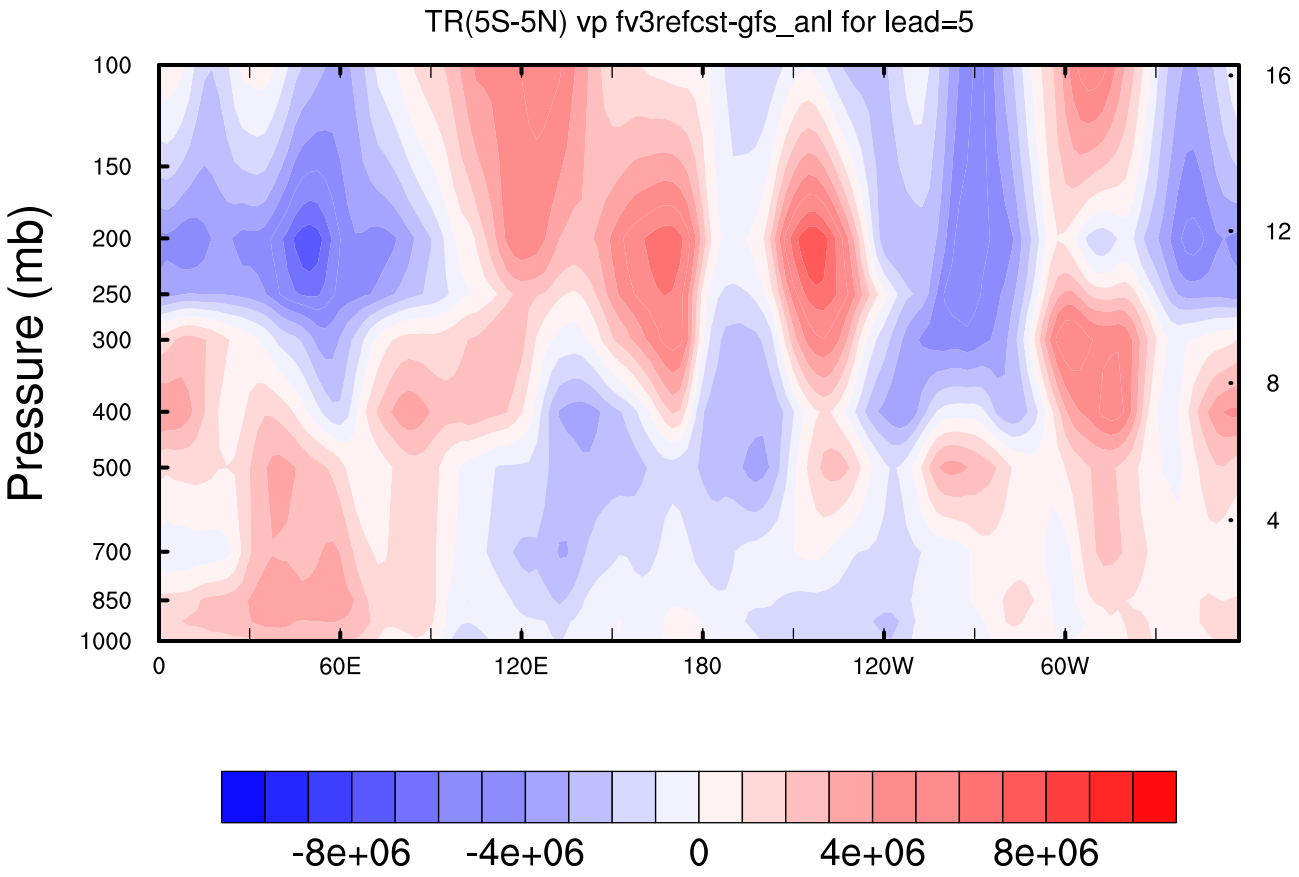

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

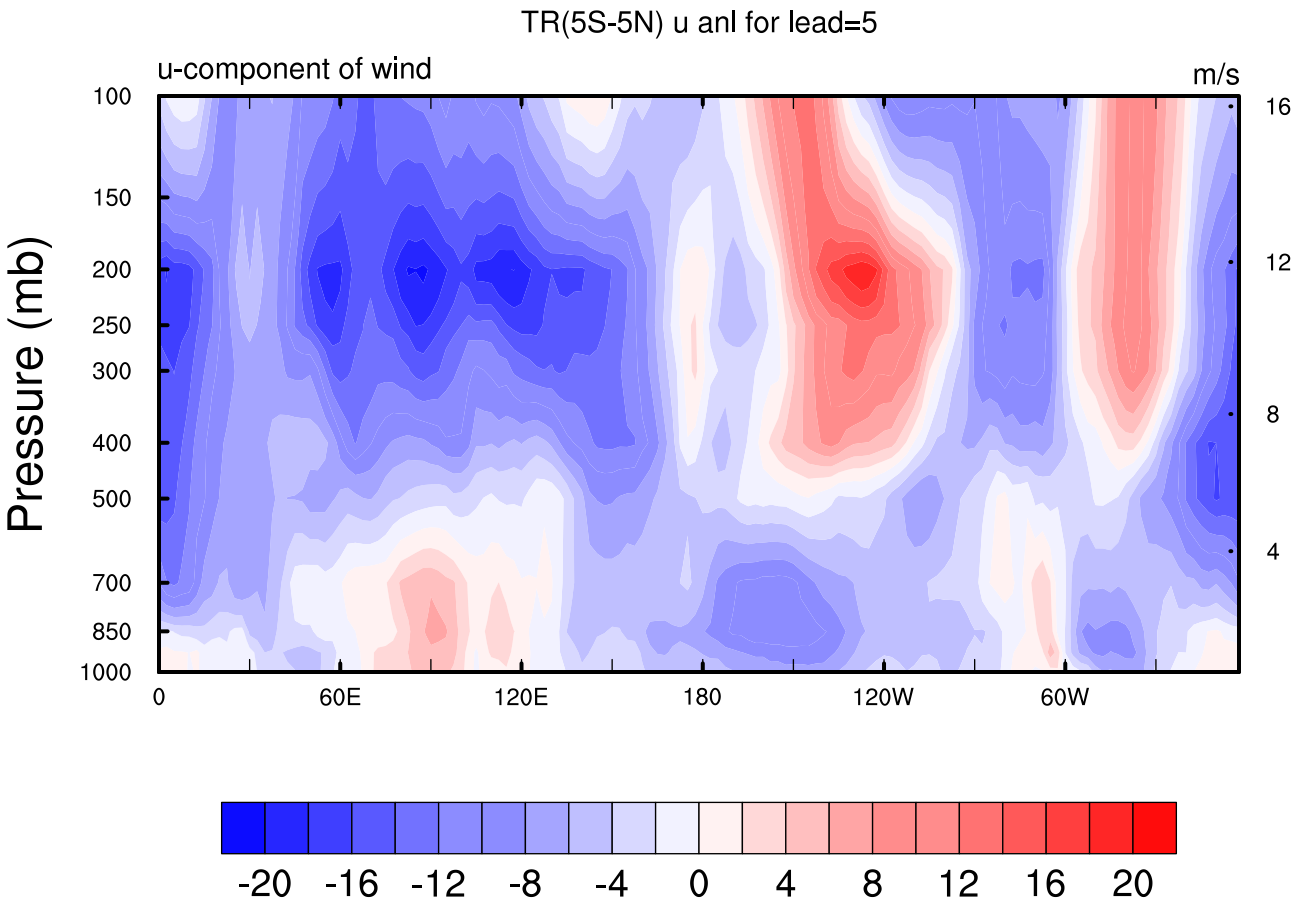

TR(5S-5N) vp anl for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

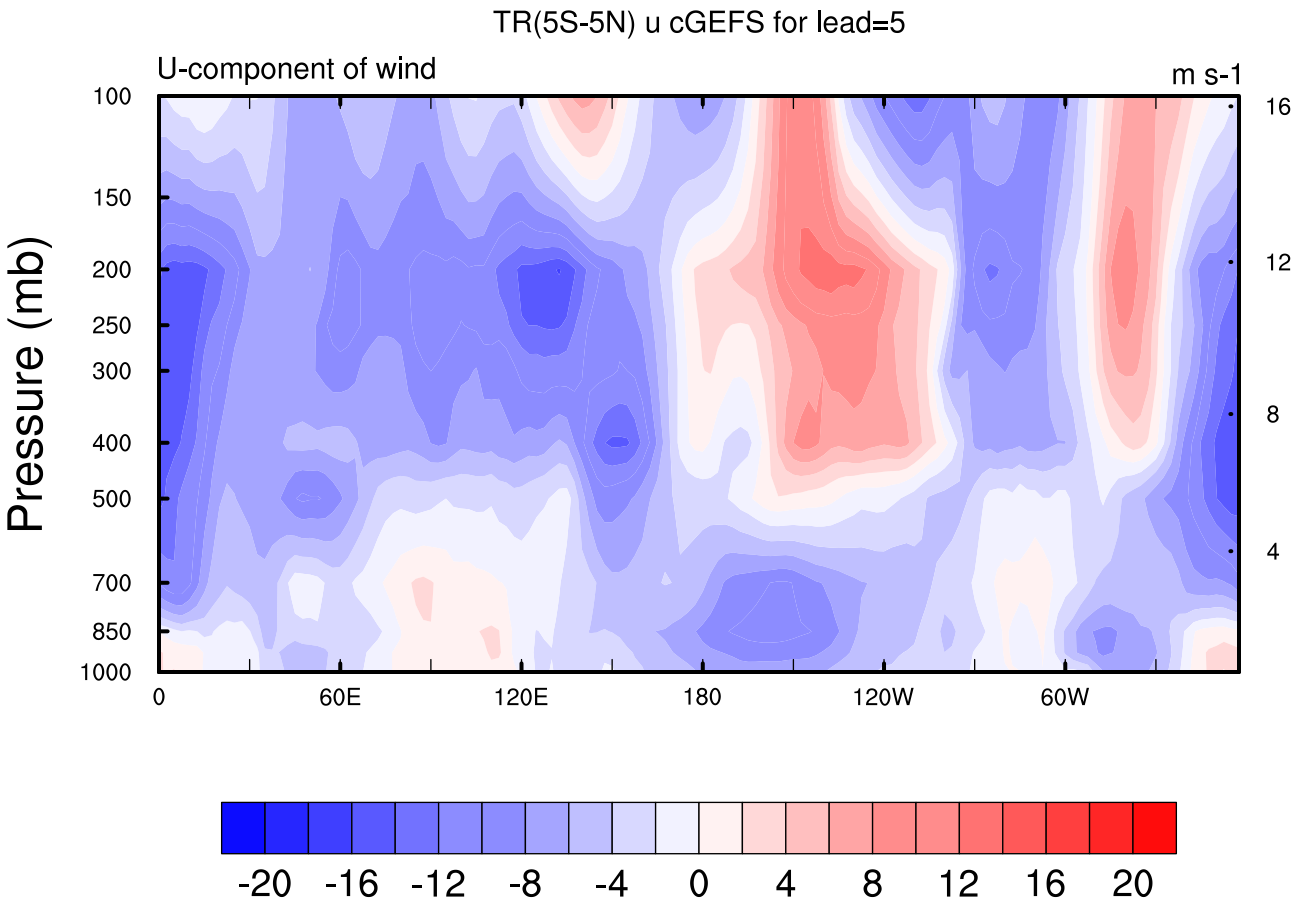

TR(5S-5N) vp cGEFS for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

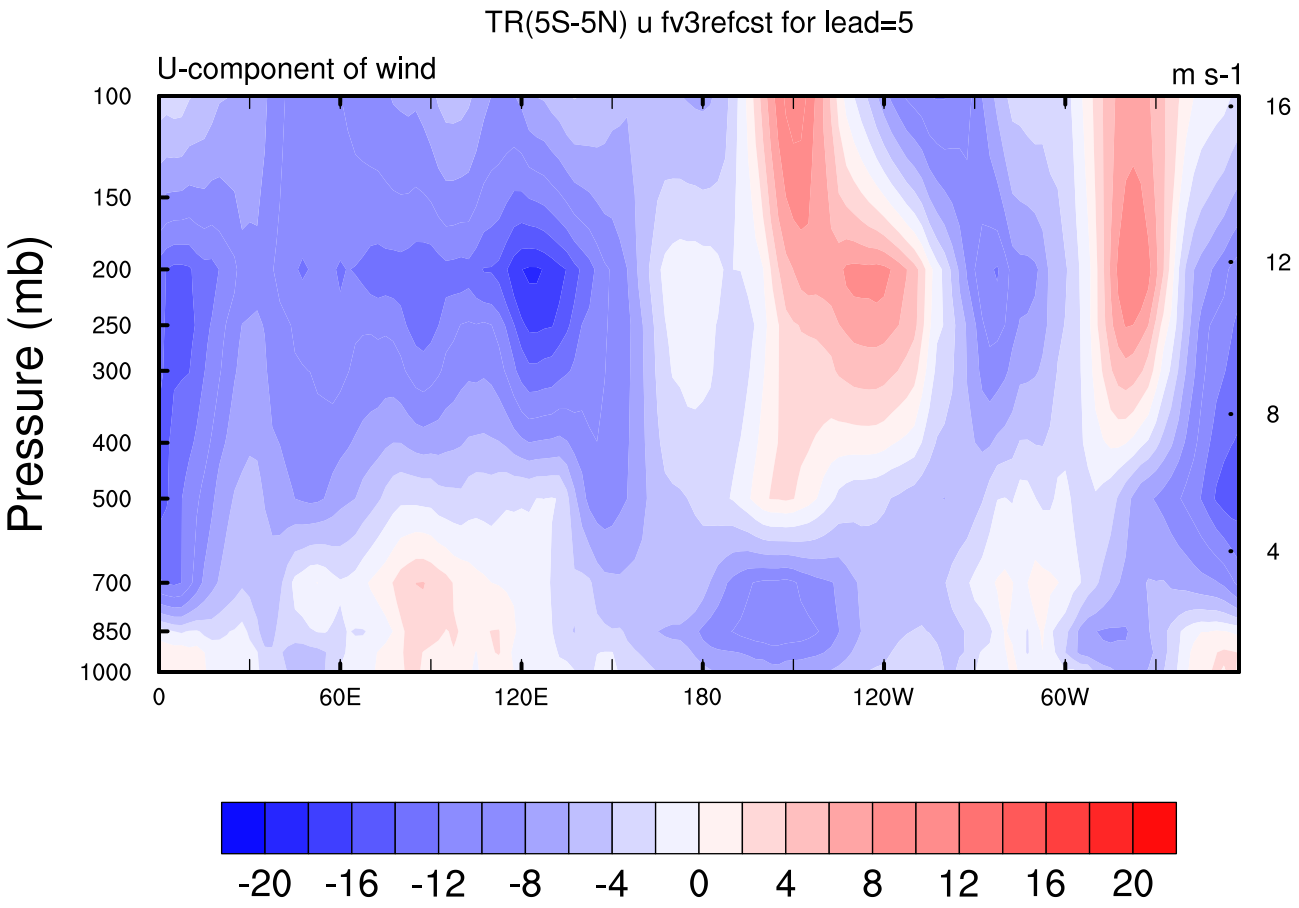

TR(5S-5N) vp fv3refcst for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

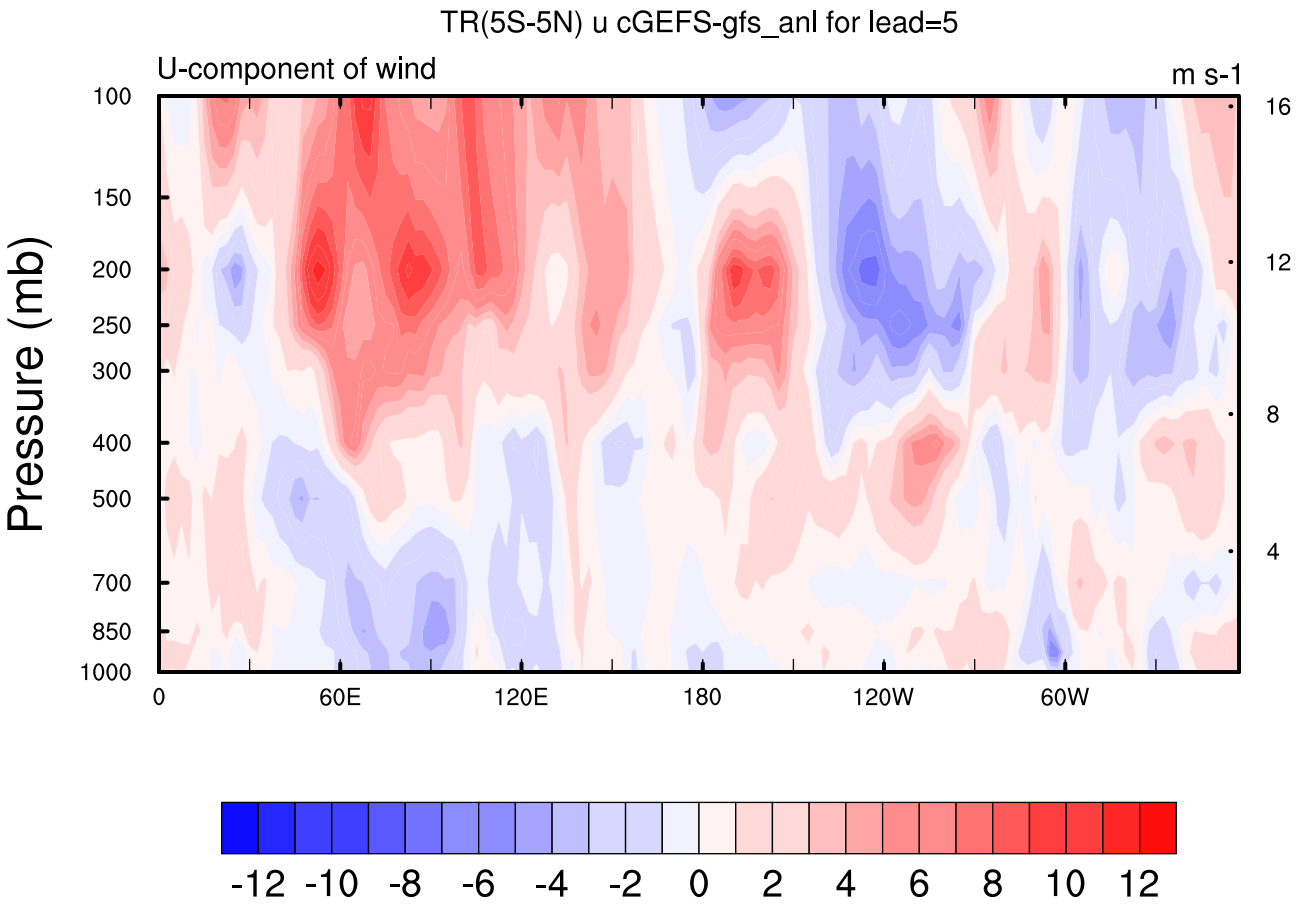

TR(5S-5N) vp cGEFS-gfs_anl for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

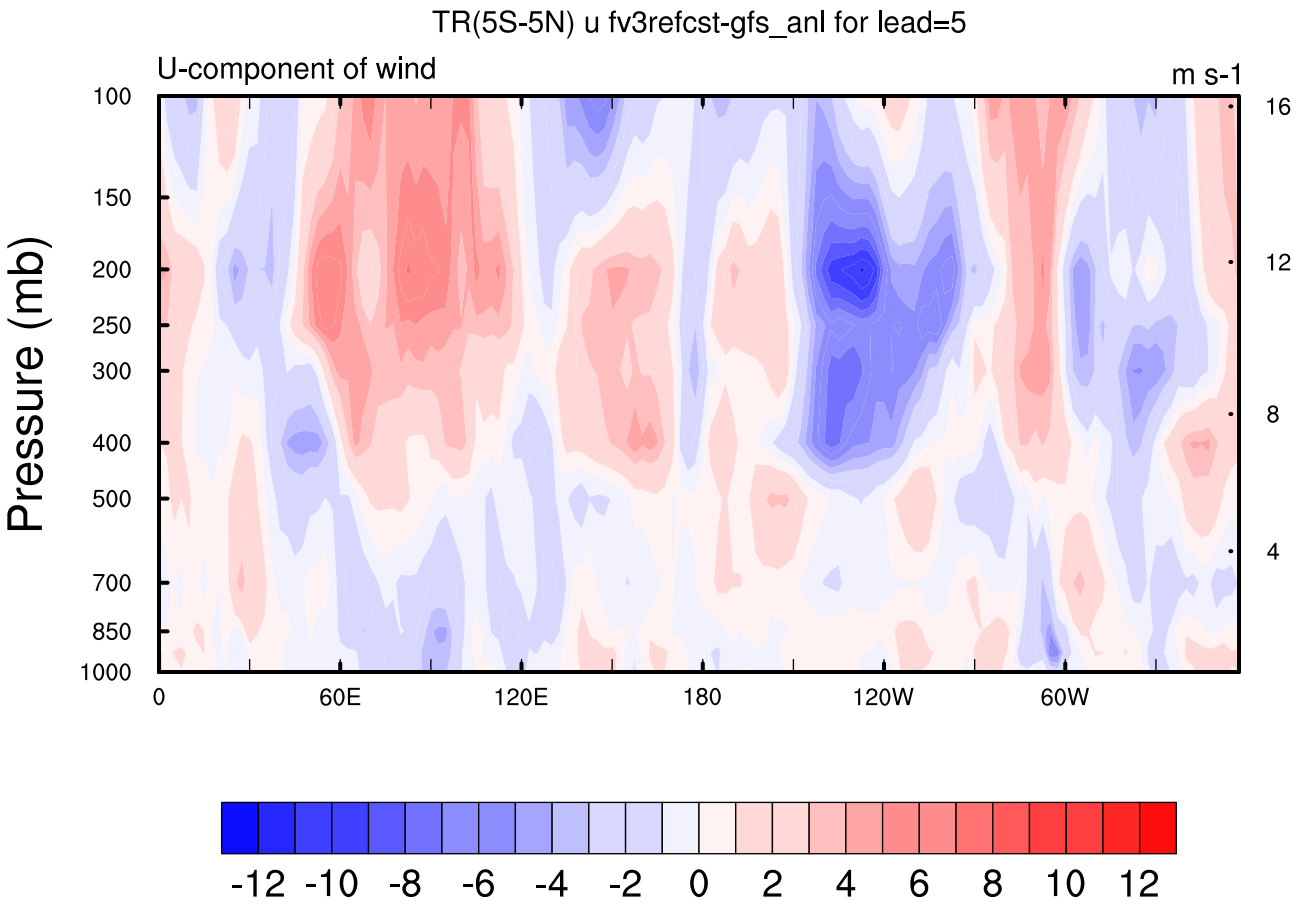

TR(5S-5N) vp fv3refcst-gfs_anl for lead=5
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

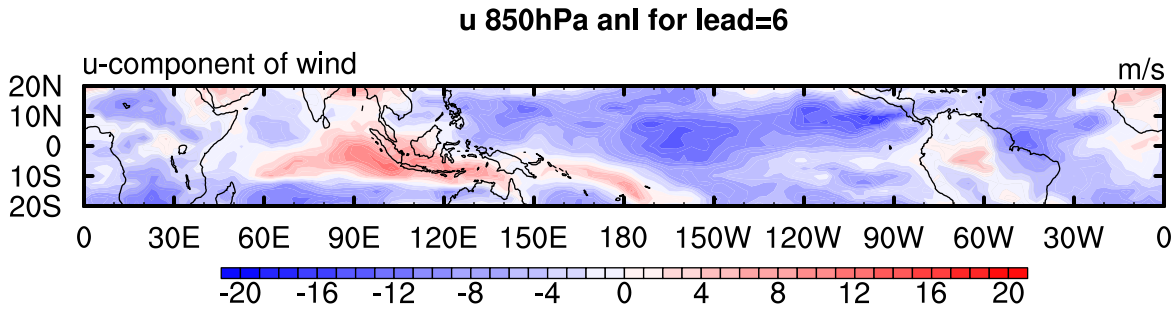

TR(5S-5N) u anl for lead=5
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

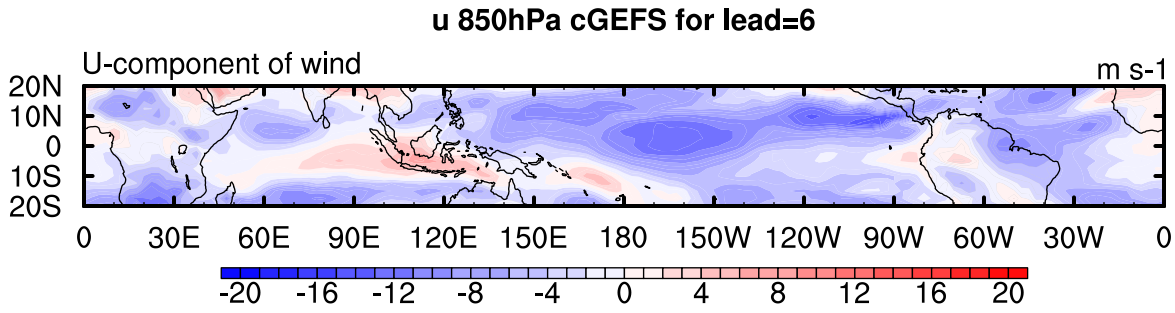

TR(5S-5N) u cGEFS for lead=5
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

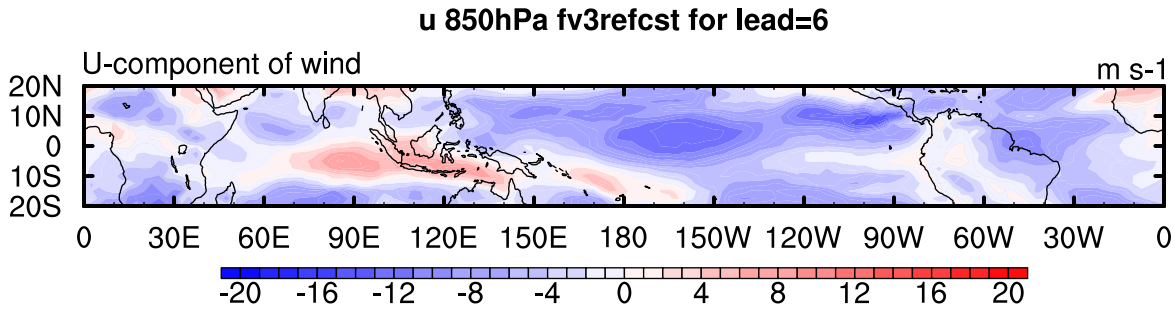

TR(5S-5N) u fv3refcst for lead=5
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

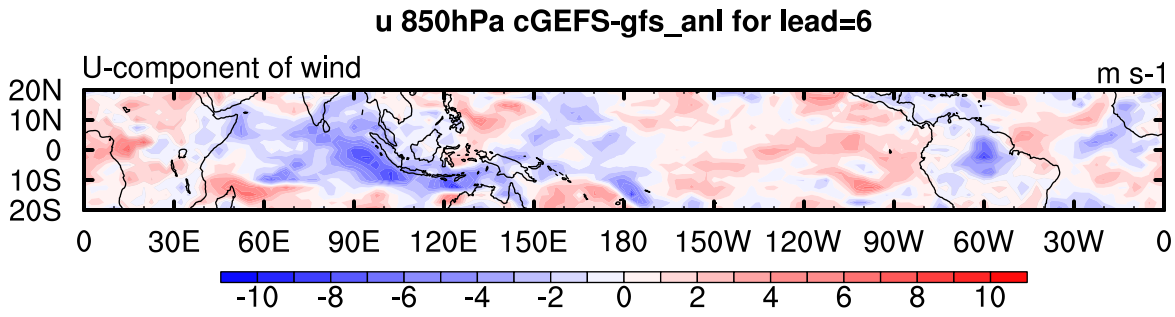

TR(5S-5N) u cGEFS-gfs_anl for lead=5
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

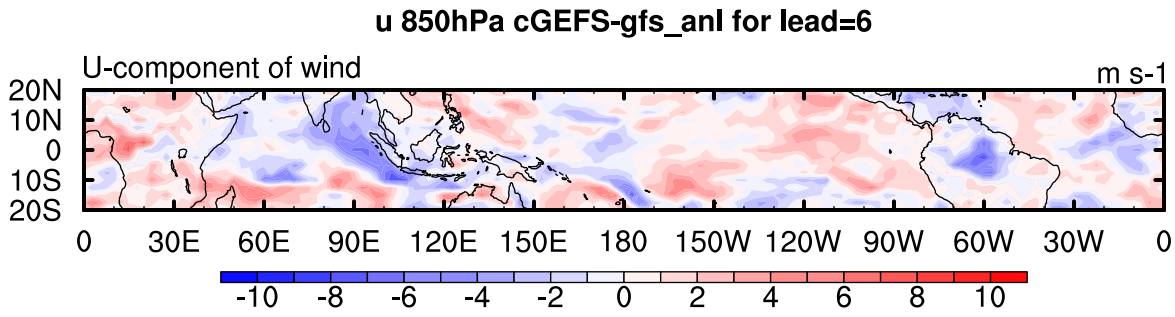

TR(5S-5N) u fv3refcst-gfs_anl for lead=5
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

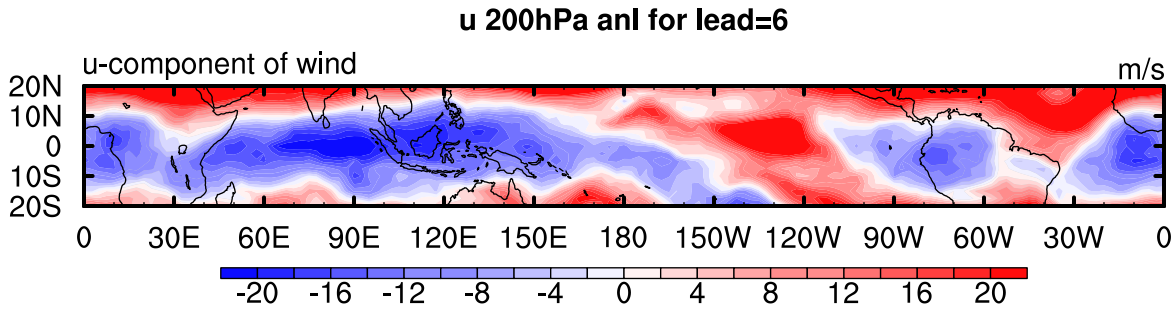

u 850hPa anl for lead=6
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

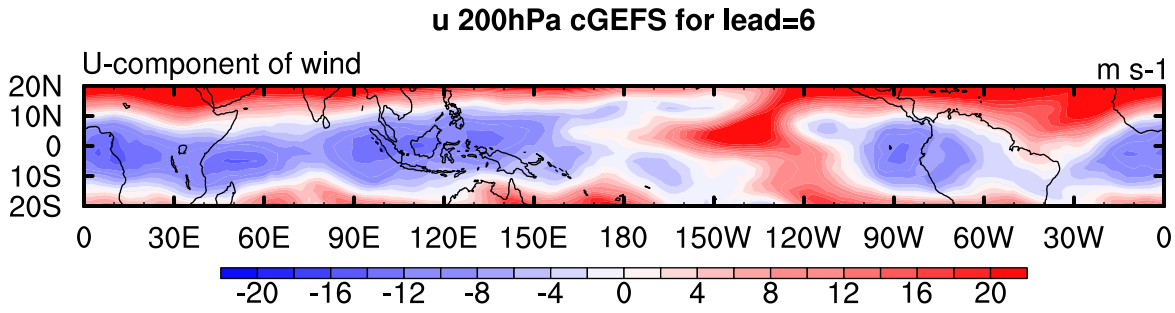

u 850hPa cGEFS for lead=6
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

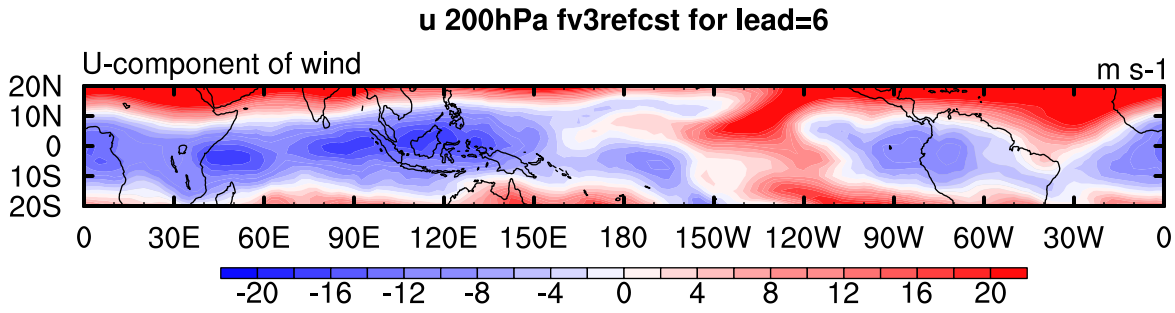

u 850hPa fv3refcst for lead=6
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

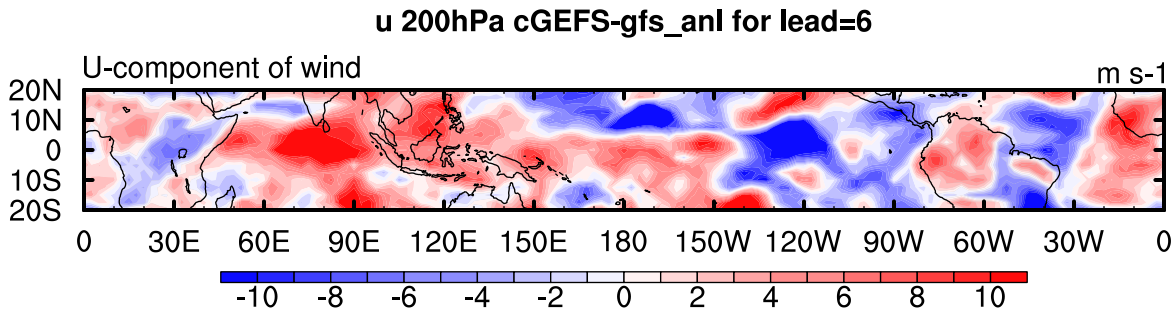

u 850hPa cGEFS-gfs_anl for lead=6
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

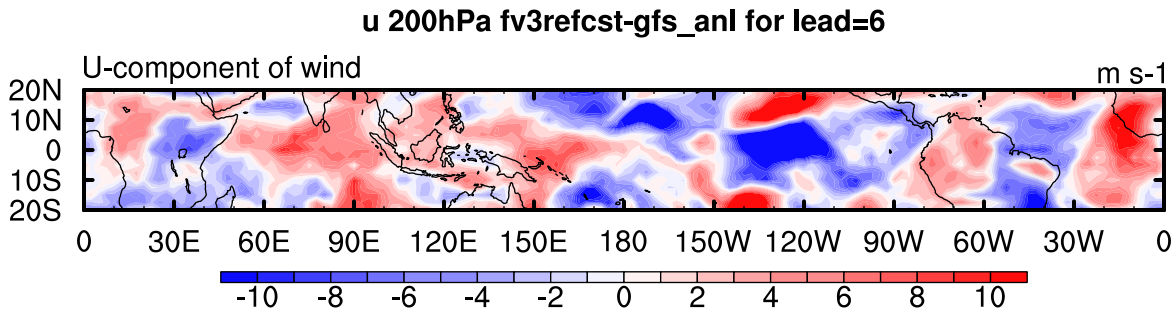

u 850hPa cGEFS-gfs_anl for lead=6
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

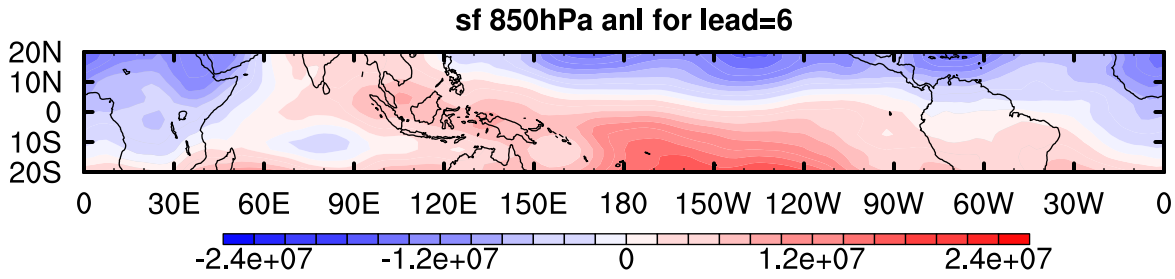

u 200hPa anl for lead=6
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

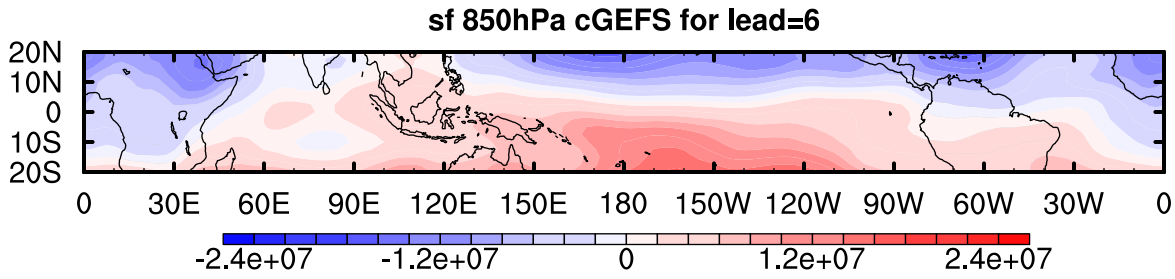

u 200hPa cGEFS for lead=6
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

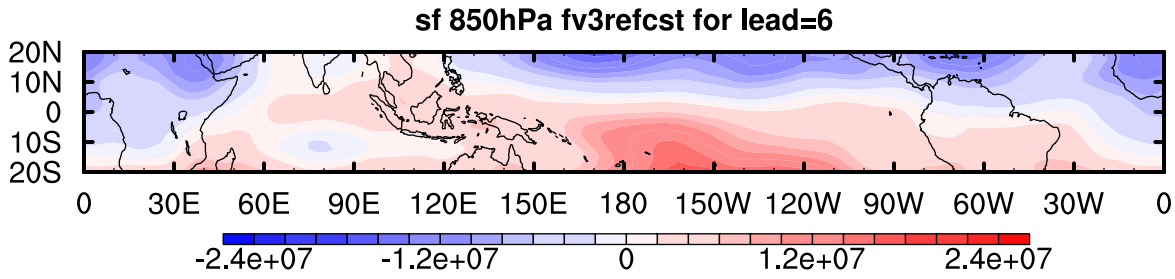

u 200hPa fv3refcst for lead=6
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

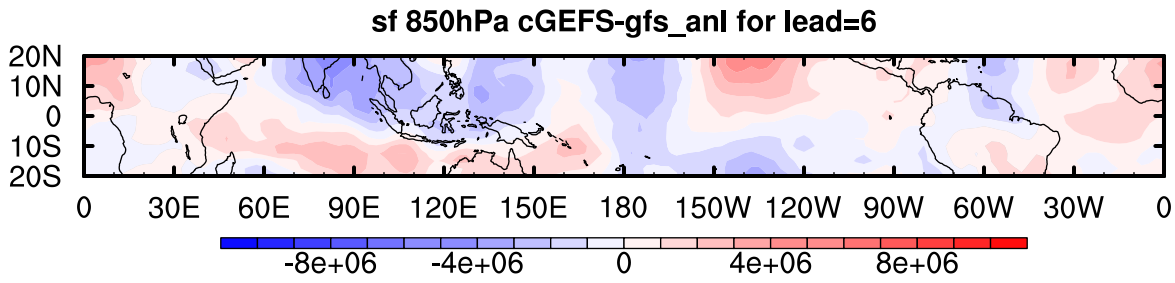

u 200hPa cGEFS-gfs_anl for lead=6
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

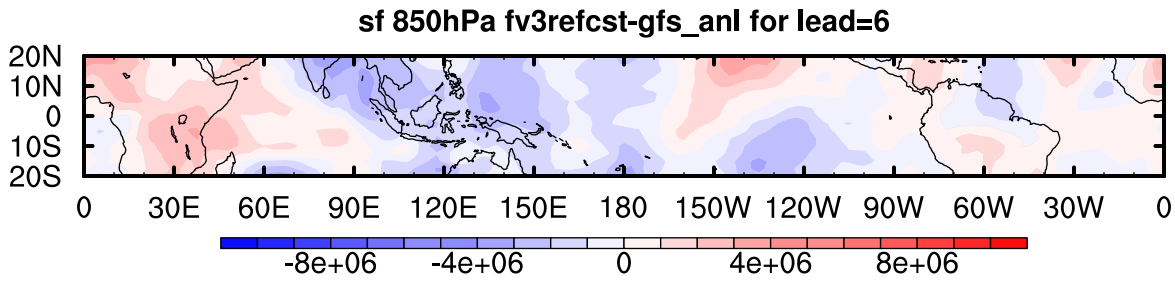

u 200hPa fv3refcst-gfs_anl for lead=6
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

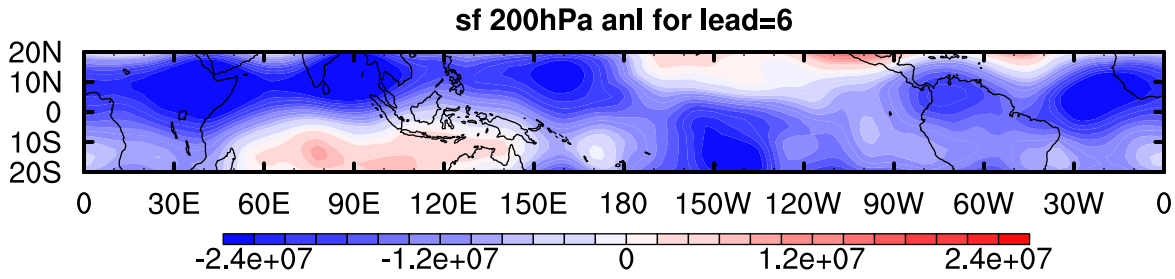

sf 850hPa anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

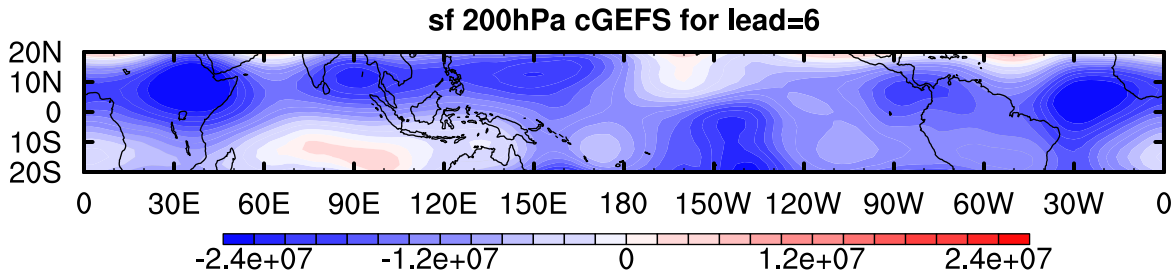

sf 850hPa cGEFS for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

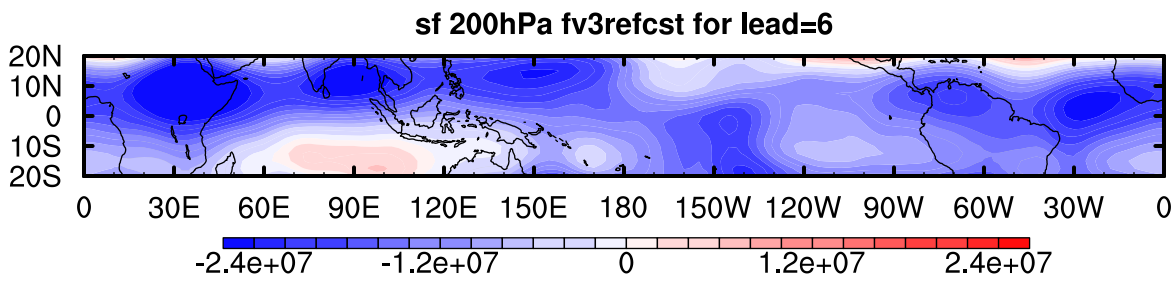

sf 850hPa fv3refcst for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

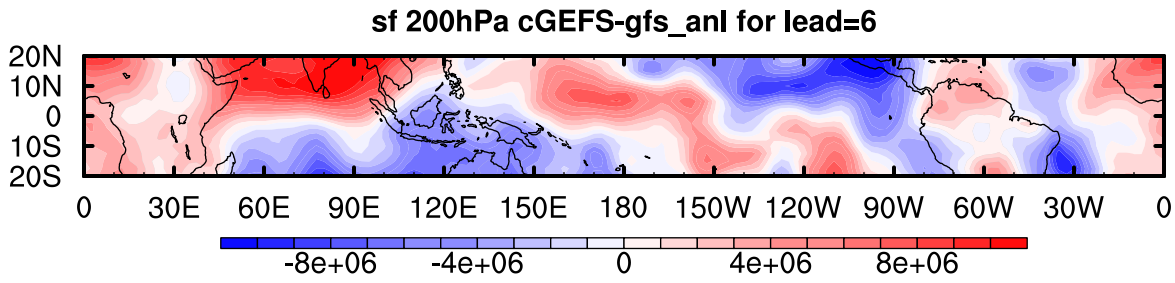

sf 850hPa cGEFS-gfs_anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

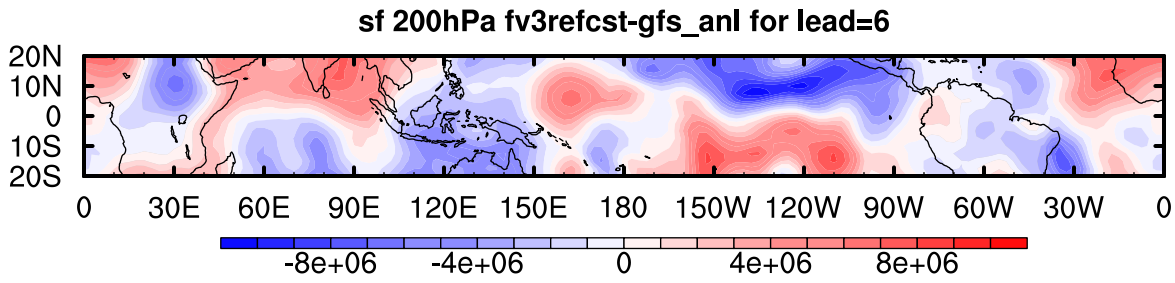

sf 850hPa fv3refcst-gfs_anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

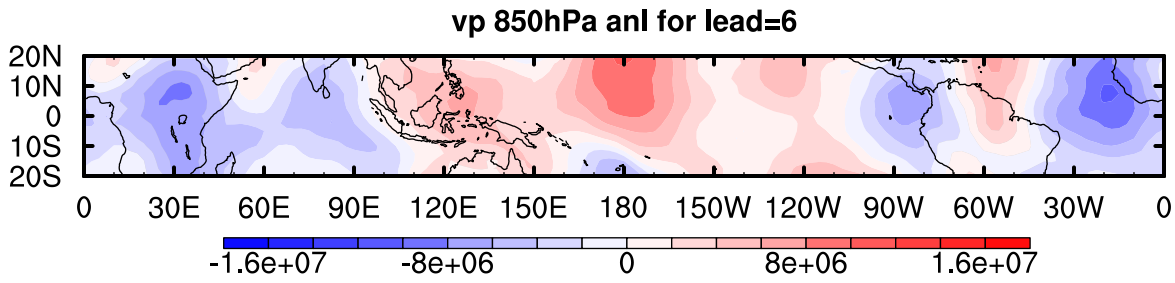

sf 200hPa anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

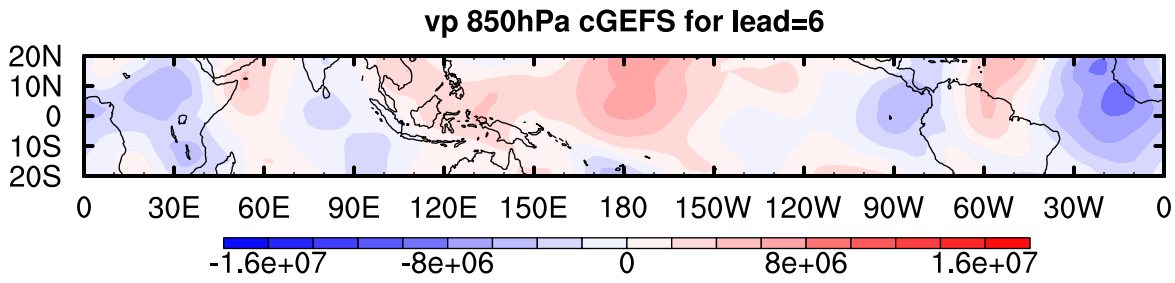

sf 200hPa cGEFS for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

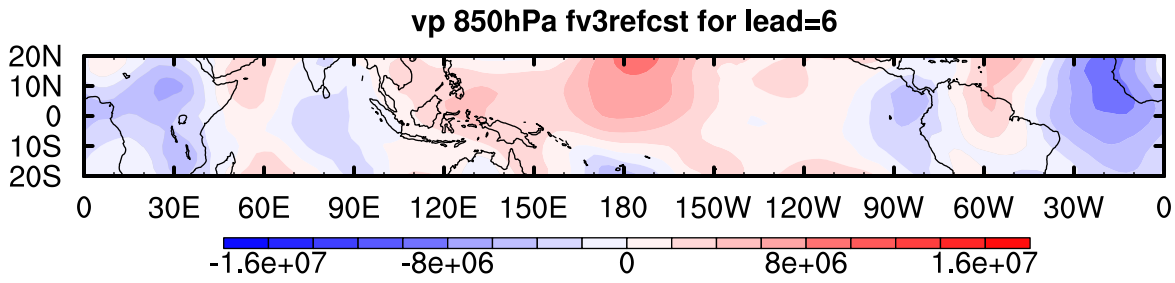

sf 200hPa fv3refcst for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

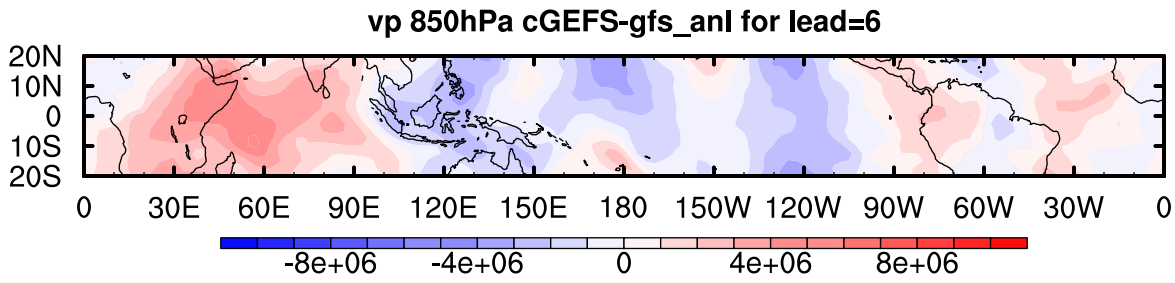

sf 200hPa cGEFS-gfs_anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

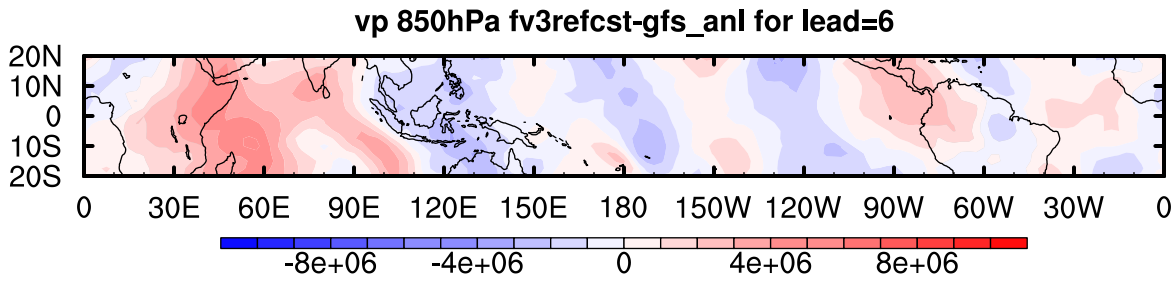

sf 200hPa fv3refcst-gfs_anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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-4e+06
0
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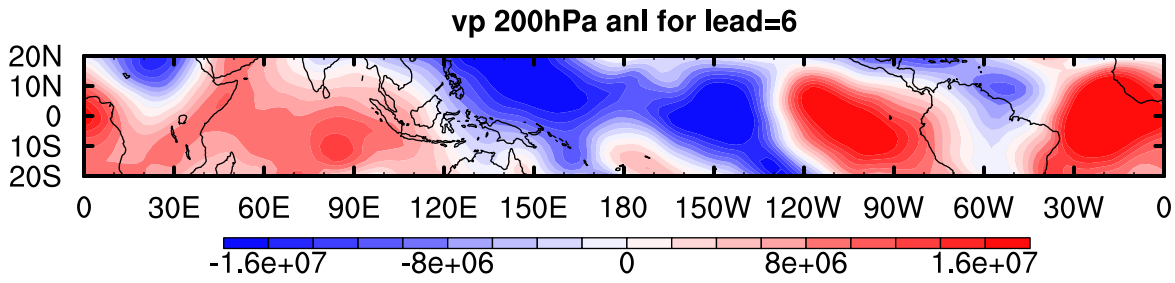
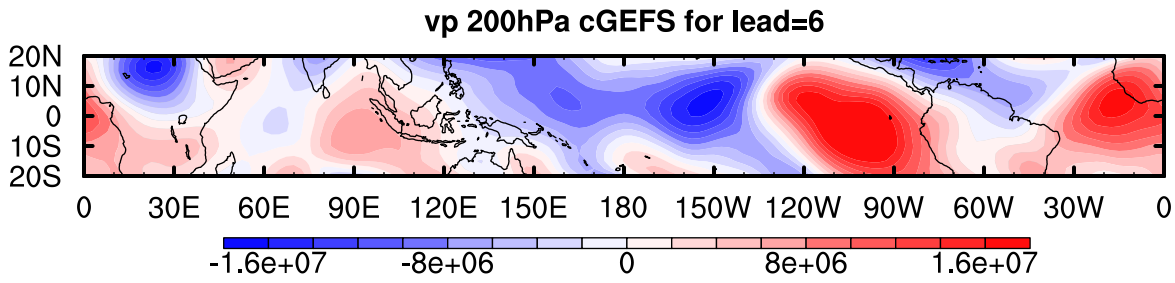
8e+06


vp 200hPa anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa cGEFS for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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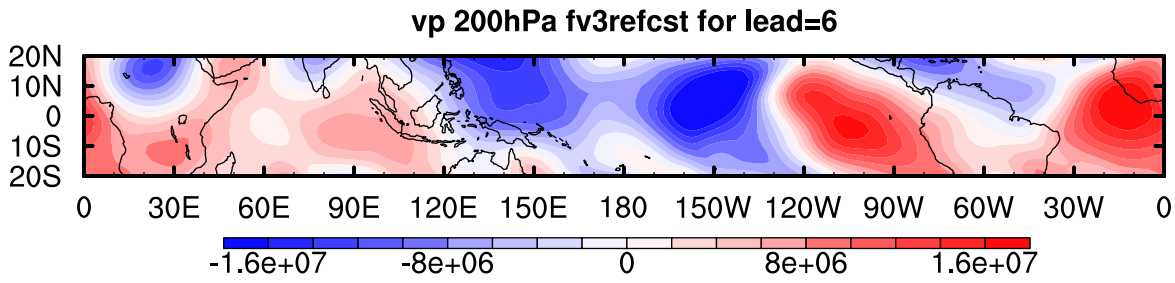
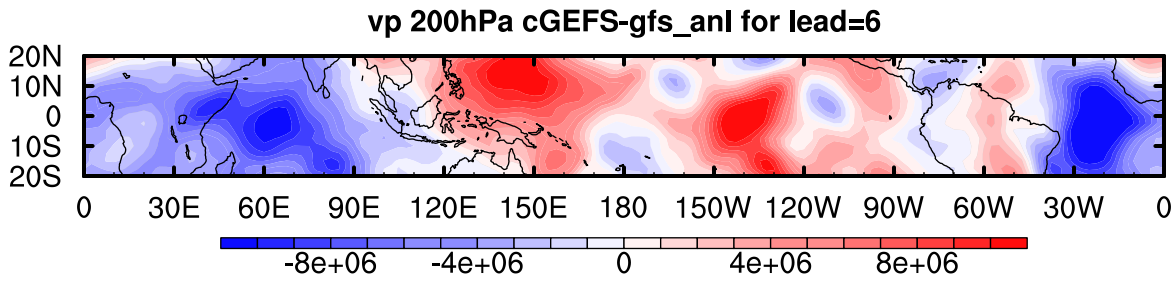
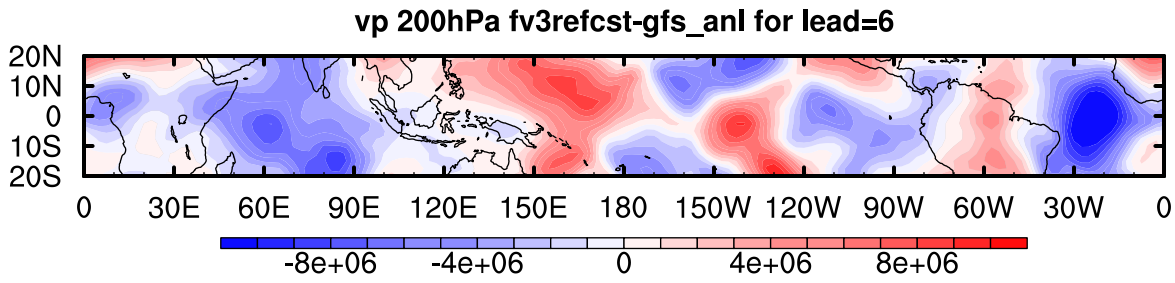
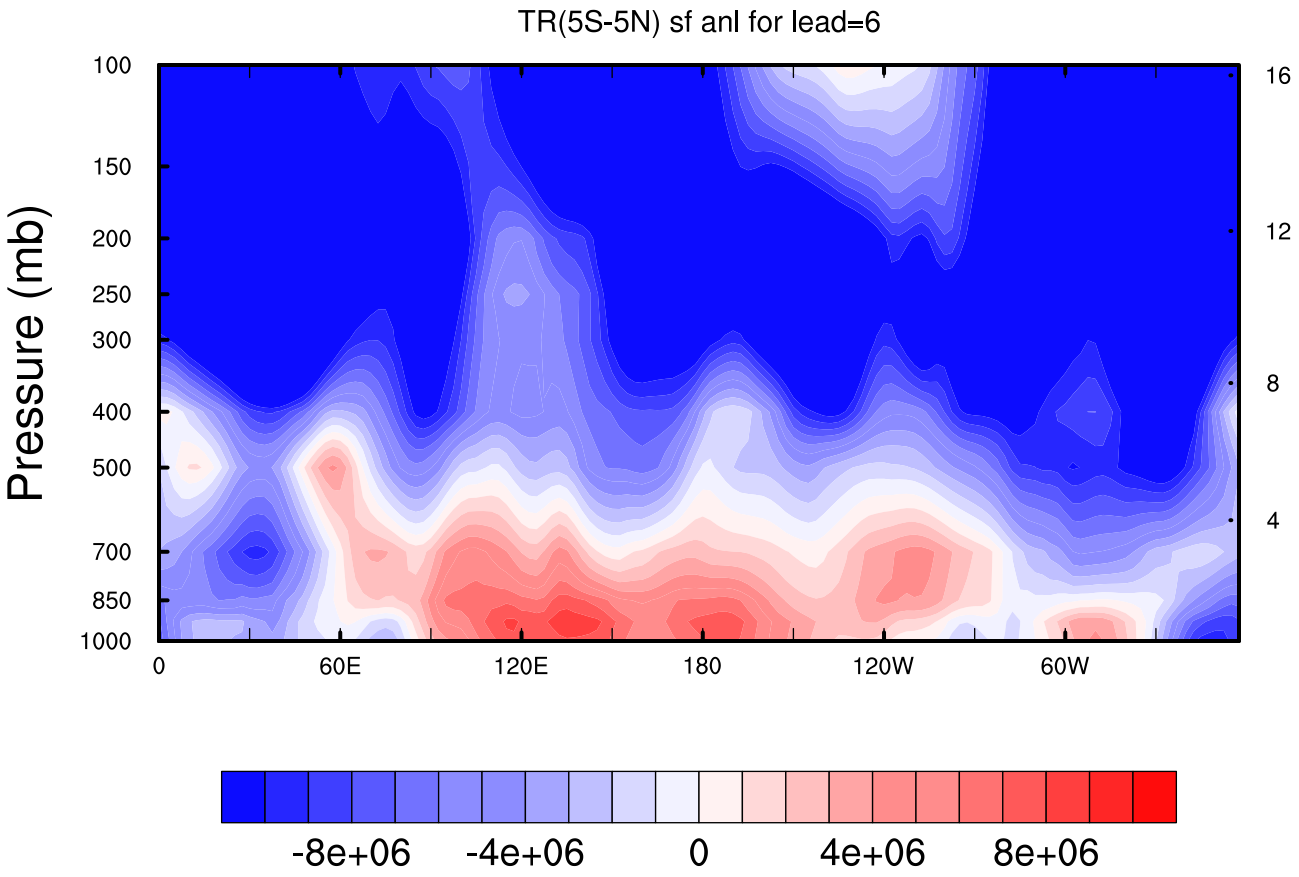
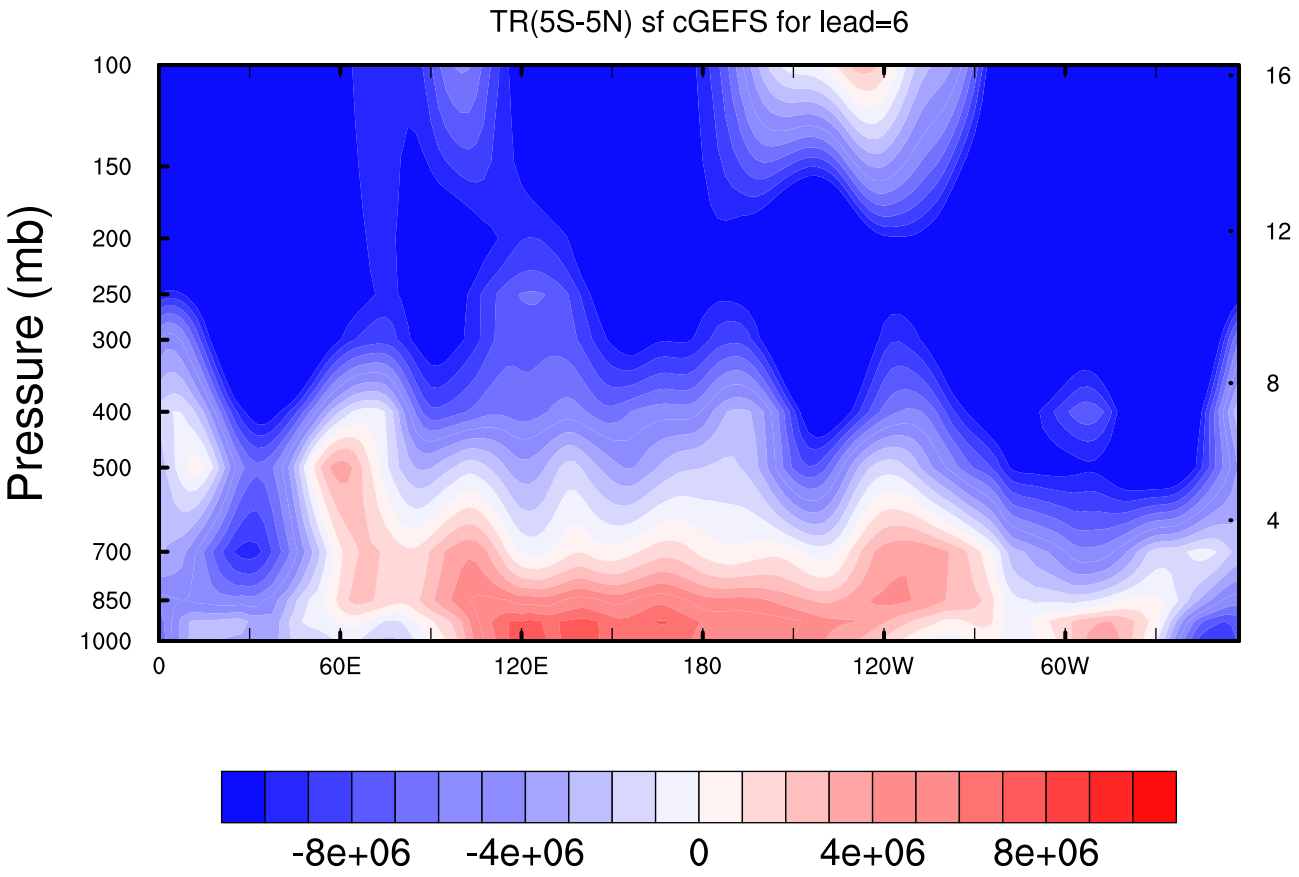
1.6e+07

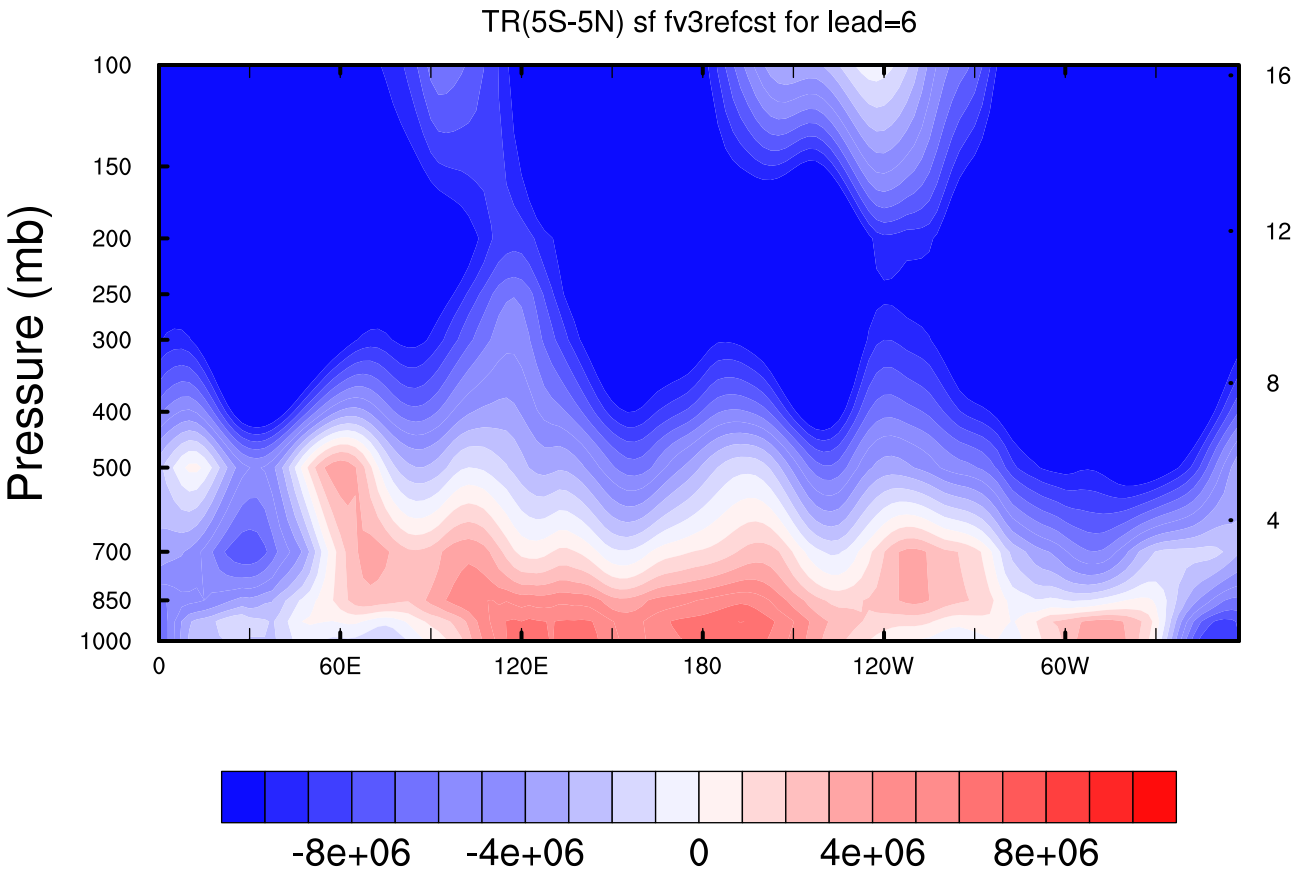

vp 200hPa fv3refcst for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

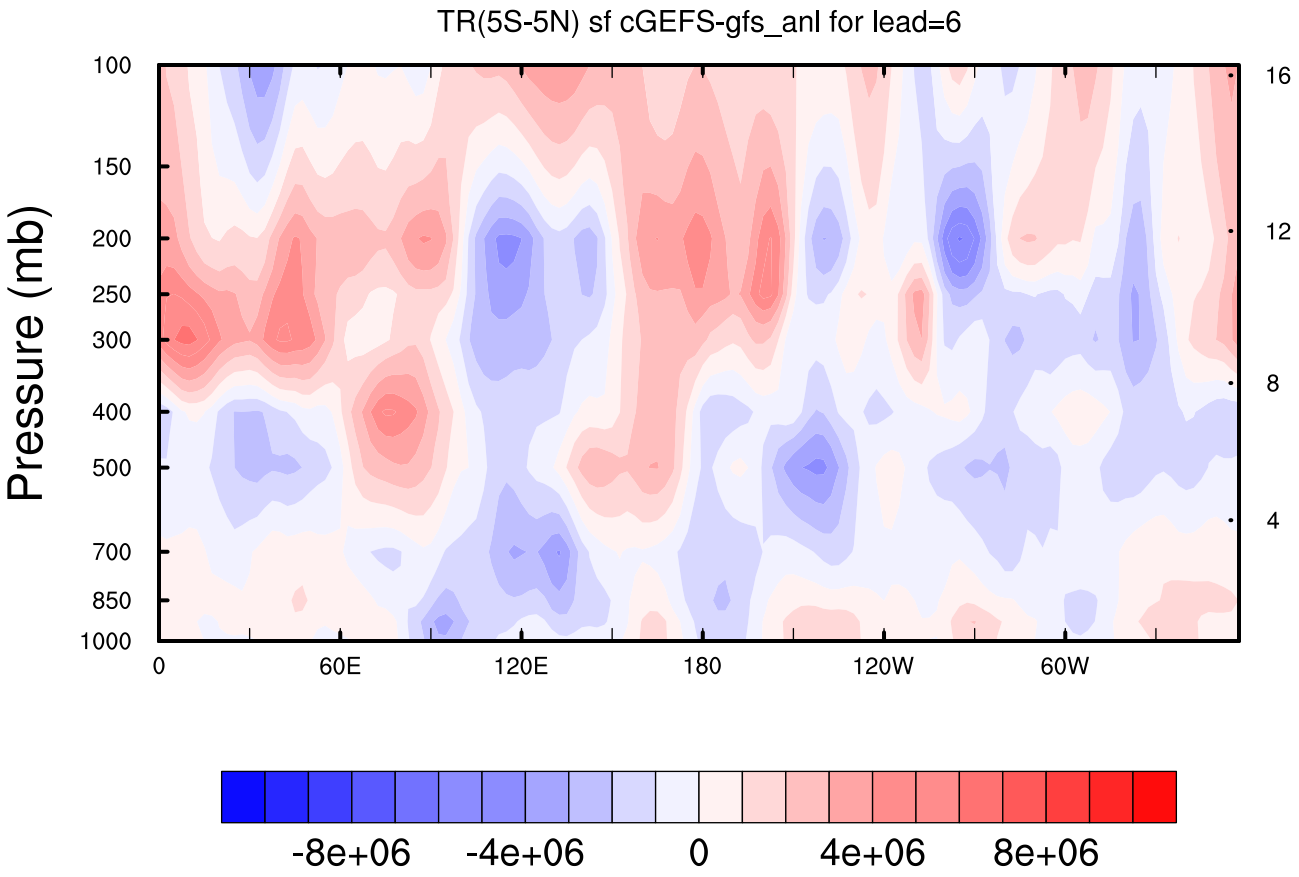

vp 200hPa cGEFS-gfs_anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

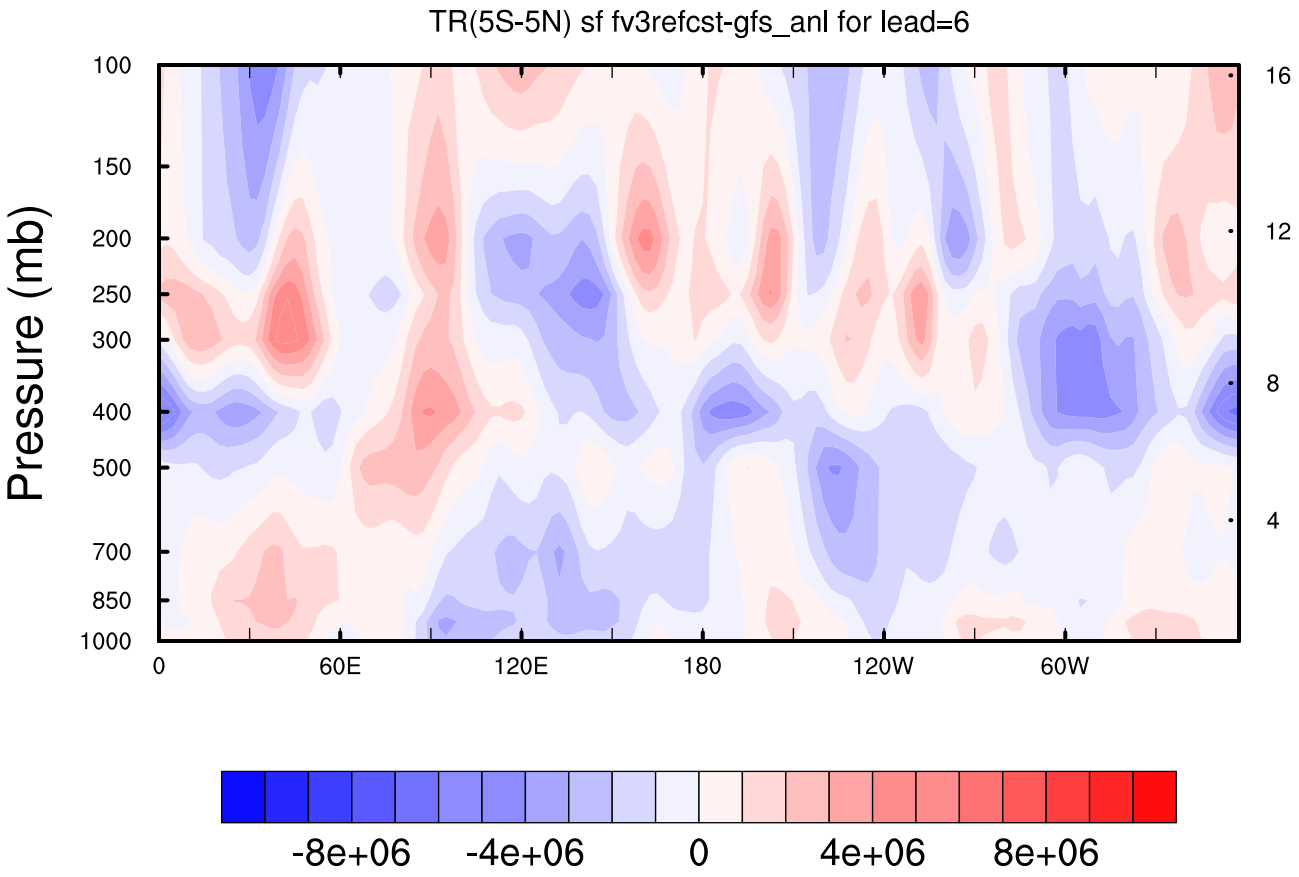

vp 200hPa fv3refcst-gfs_anl for lead=6
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

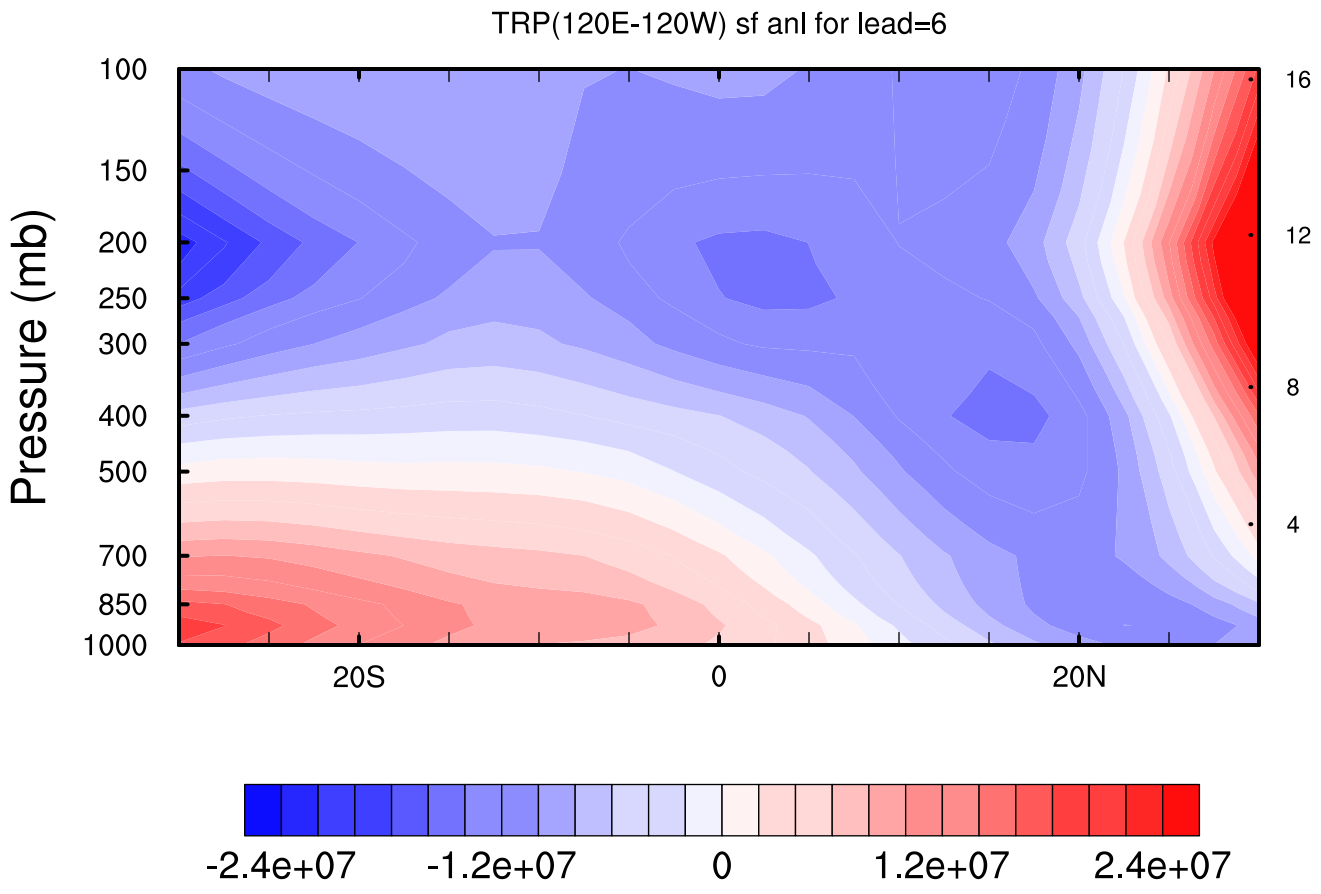

TR(5S-5N) sf anl for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

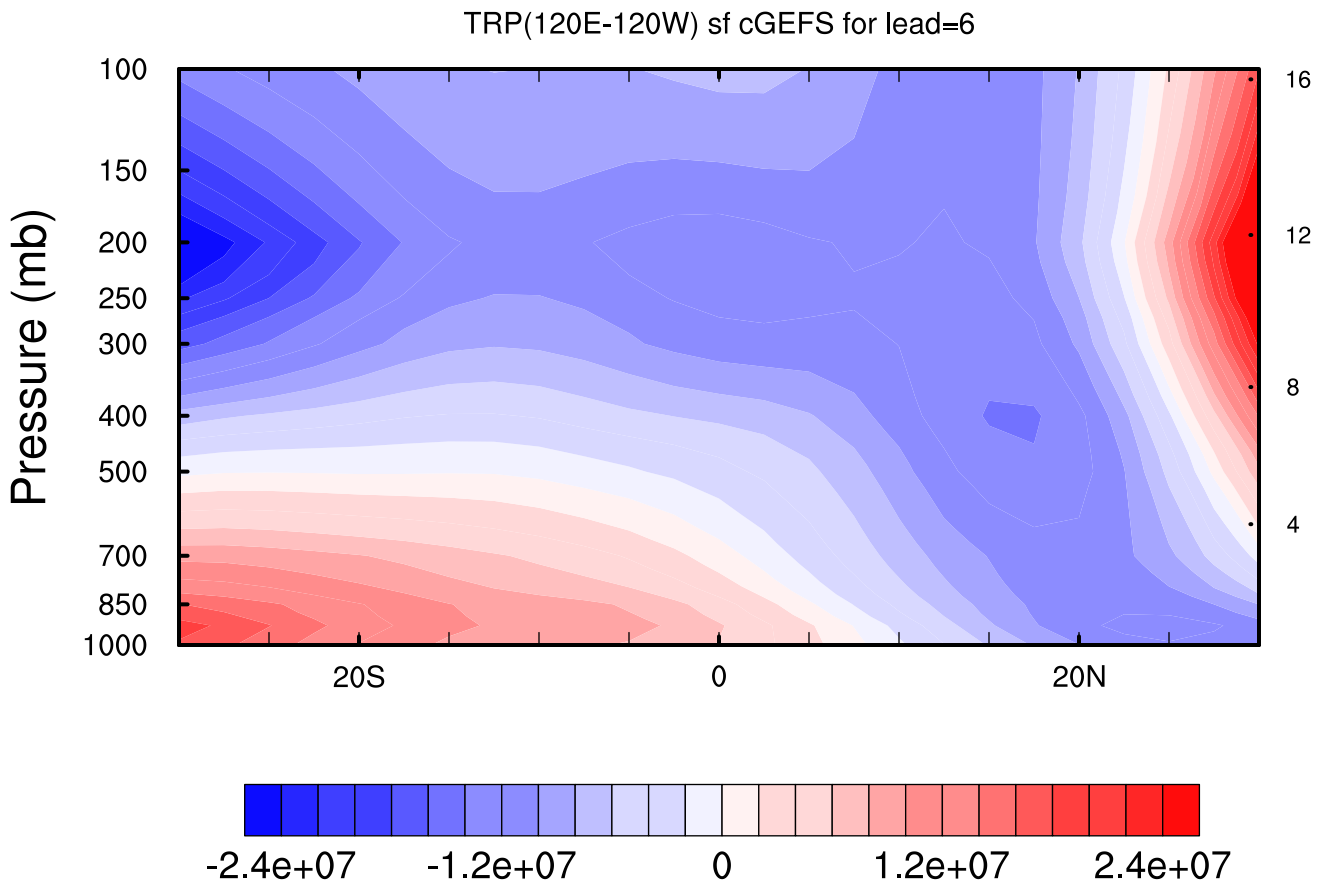

TR(5S-5N) sf cGEFS for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

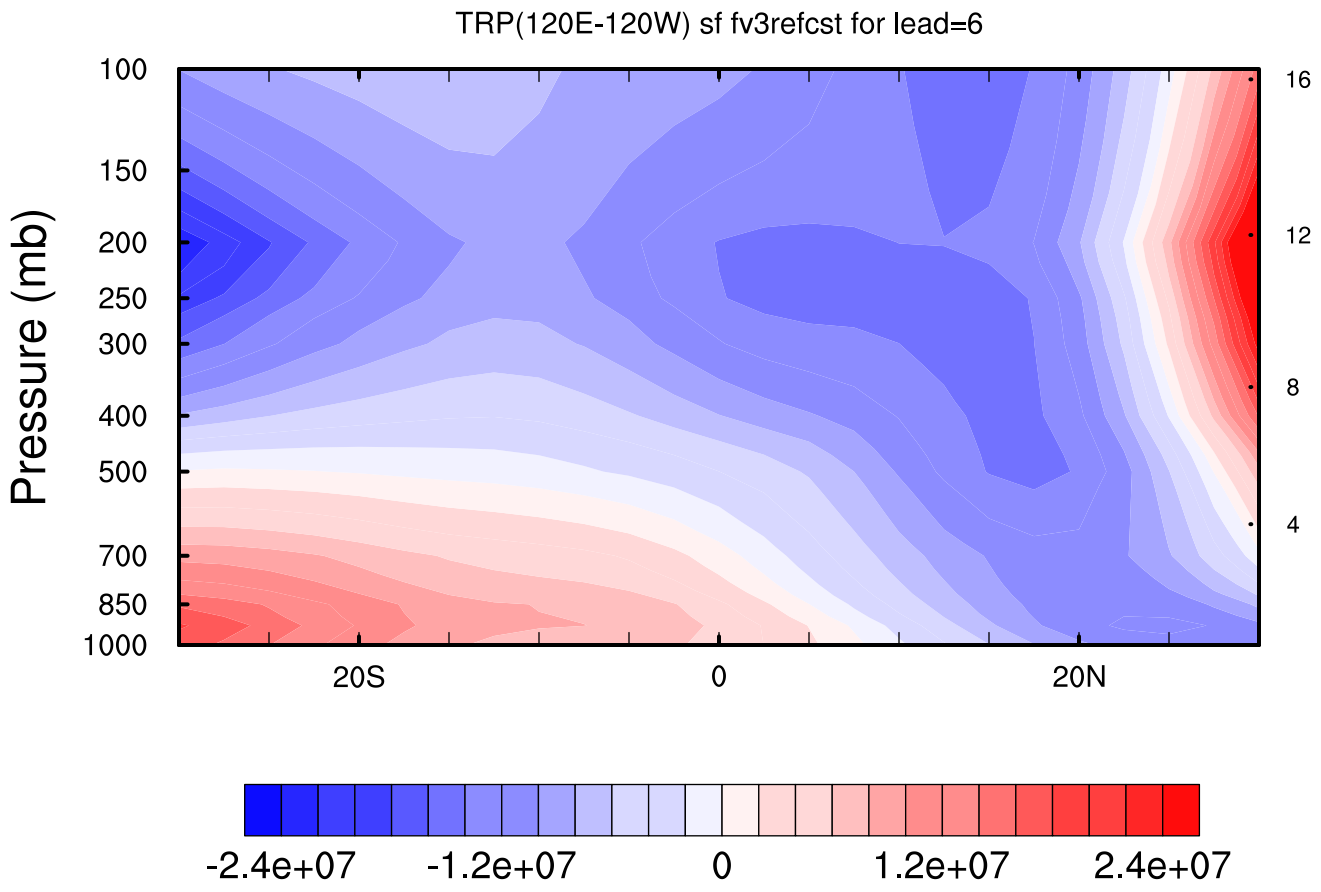

TR(5S-5N) sf fv3refcst for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

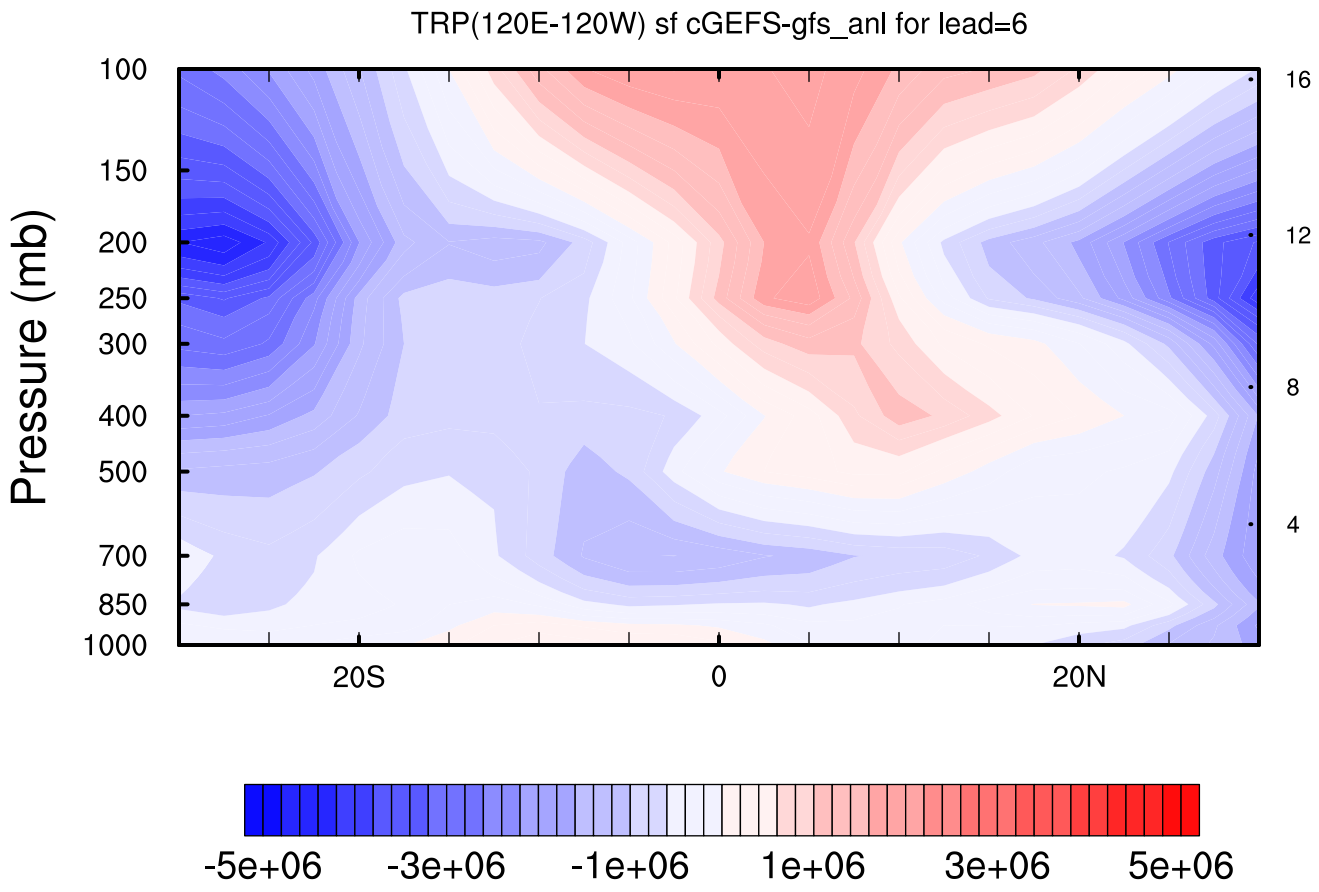

TR(5S-5N) sf cGEFS-gfs_anl for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

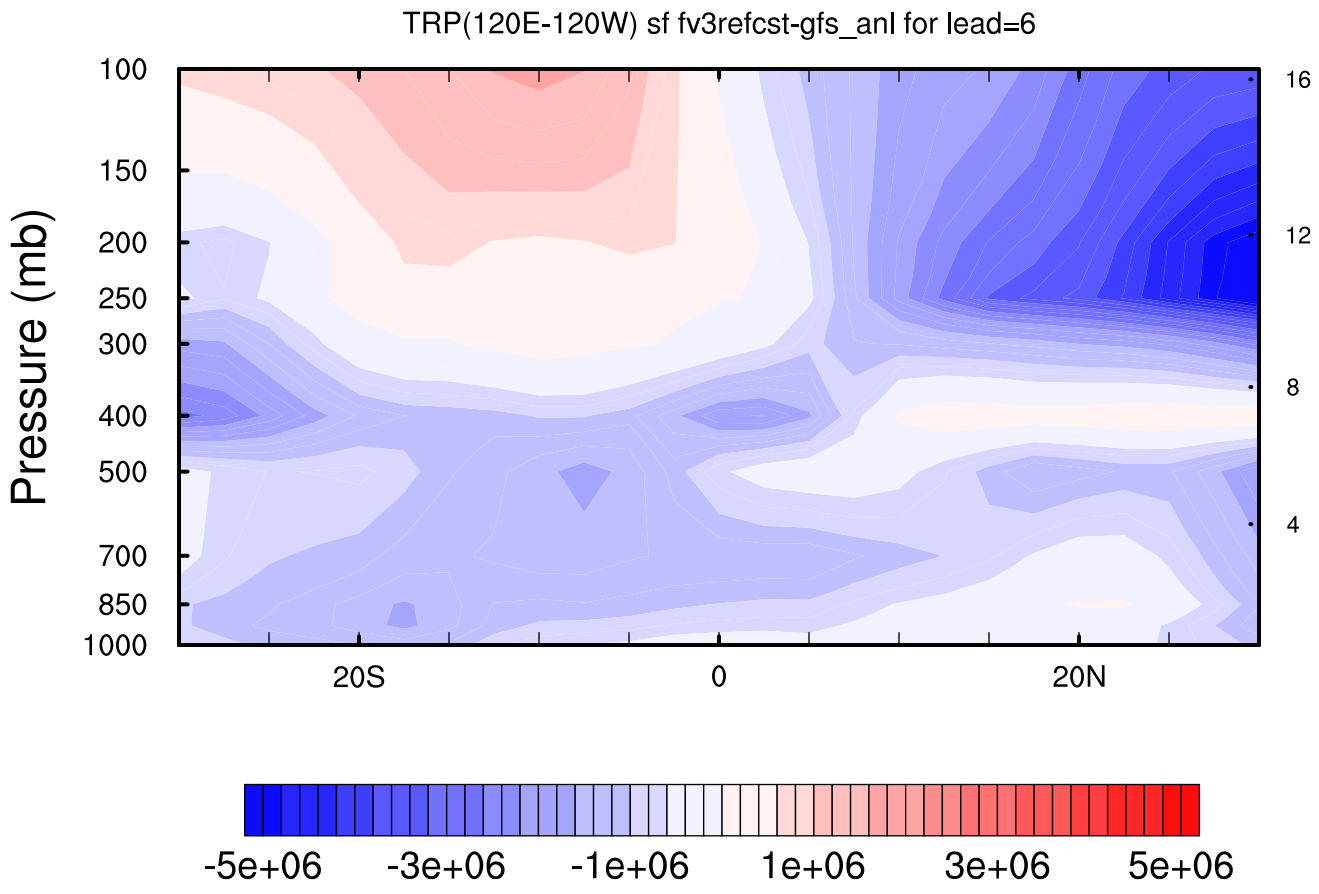

TR(5S-5N) sf fv3refcst-gfs_anl for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

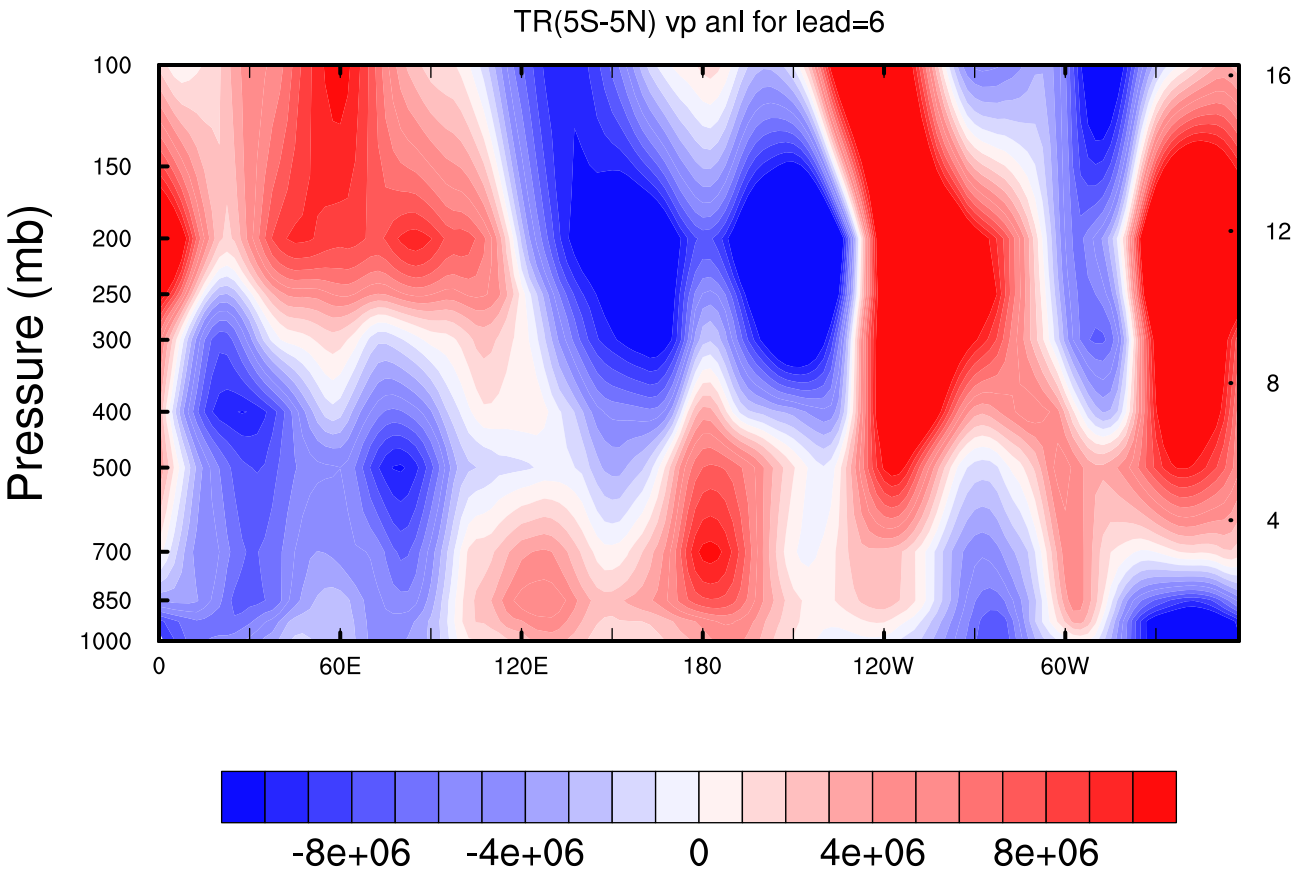

TRP(120E-120W) sf anl for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

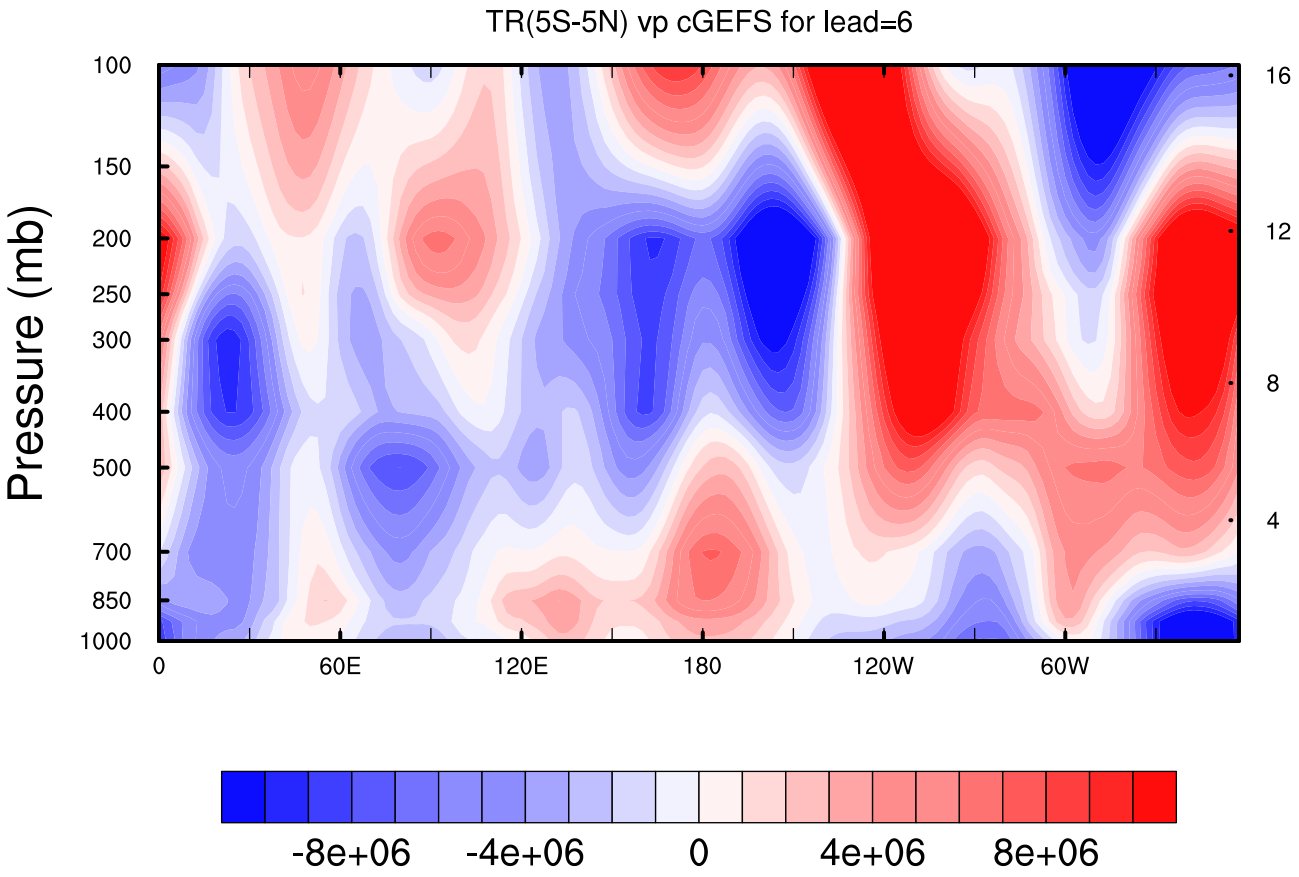

TRP(120E-120W) sf cGEFS for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

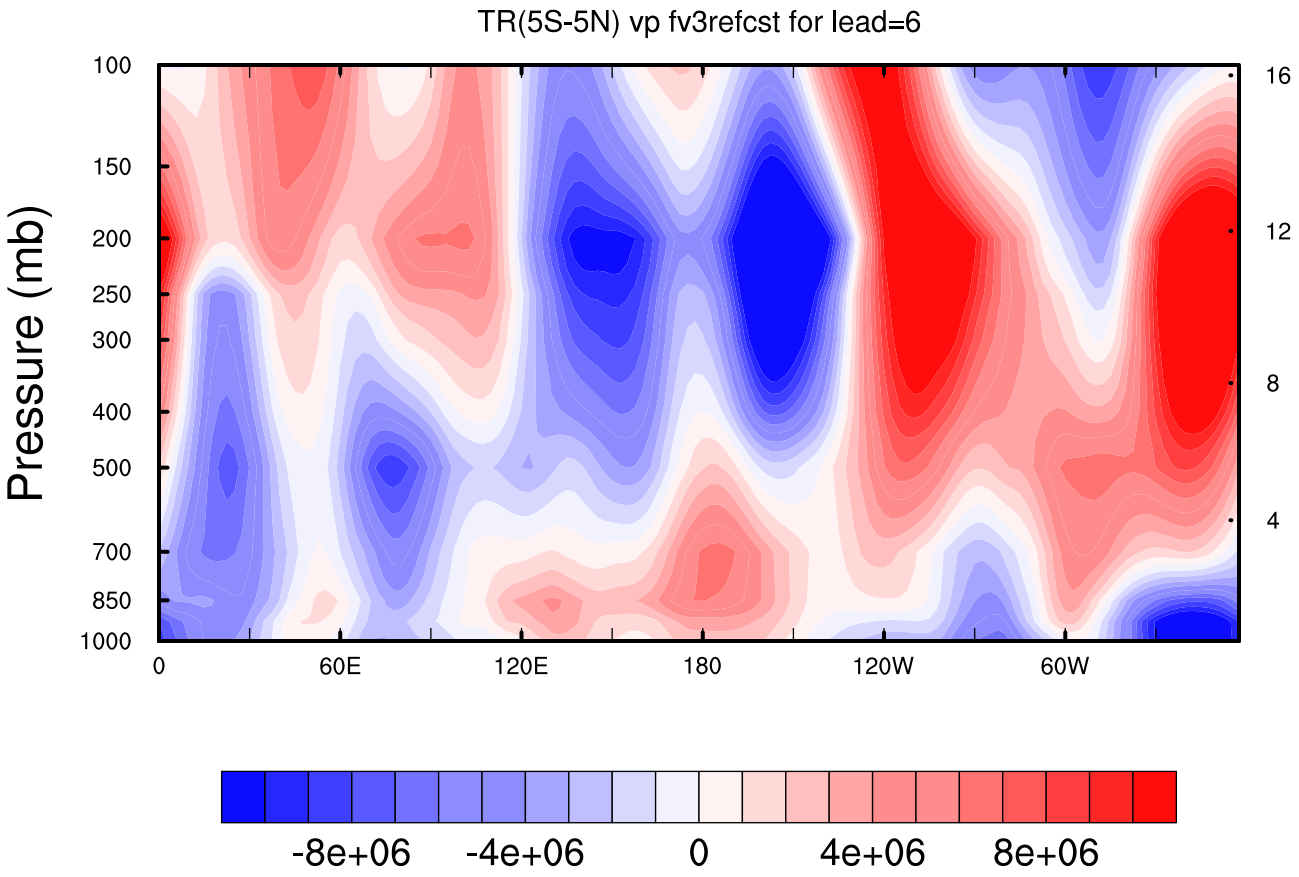

TRP(120E-120W) sf fv3refcst for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

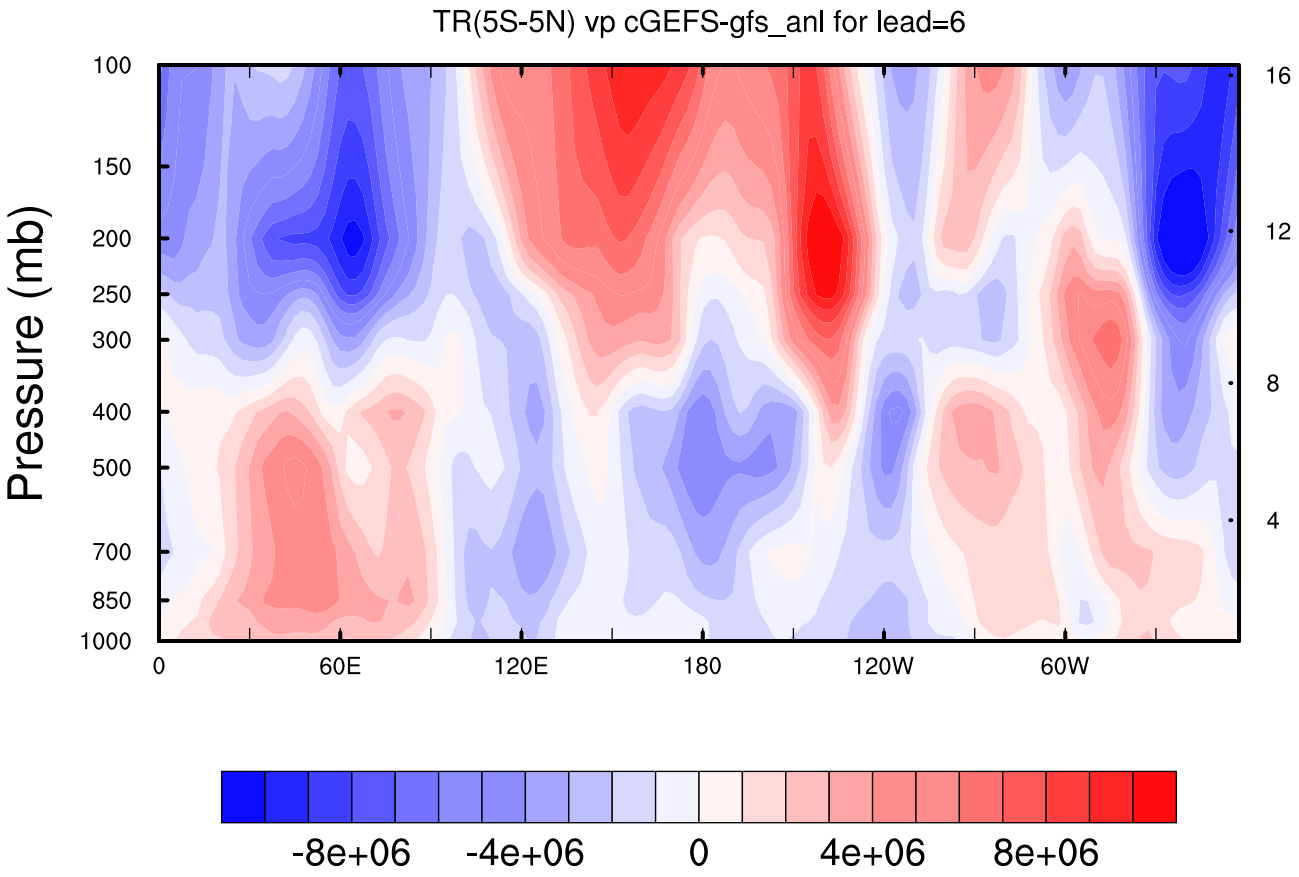

TRP(120E-120W) sf cGEFS-gfs_anl for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

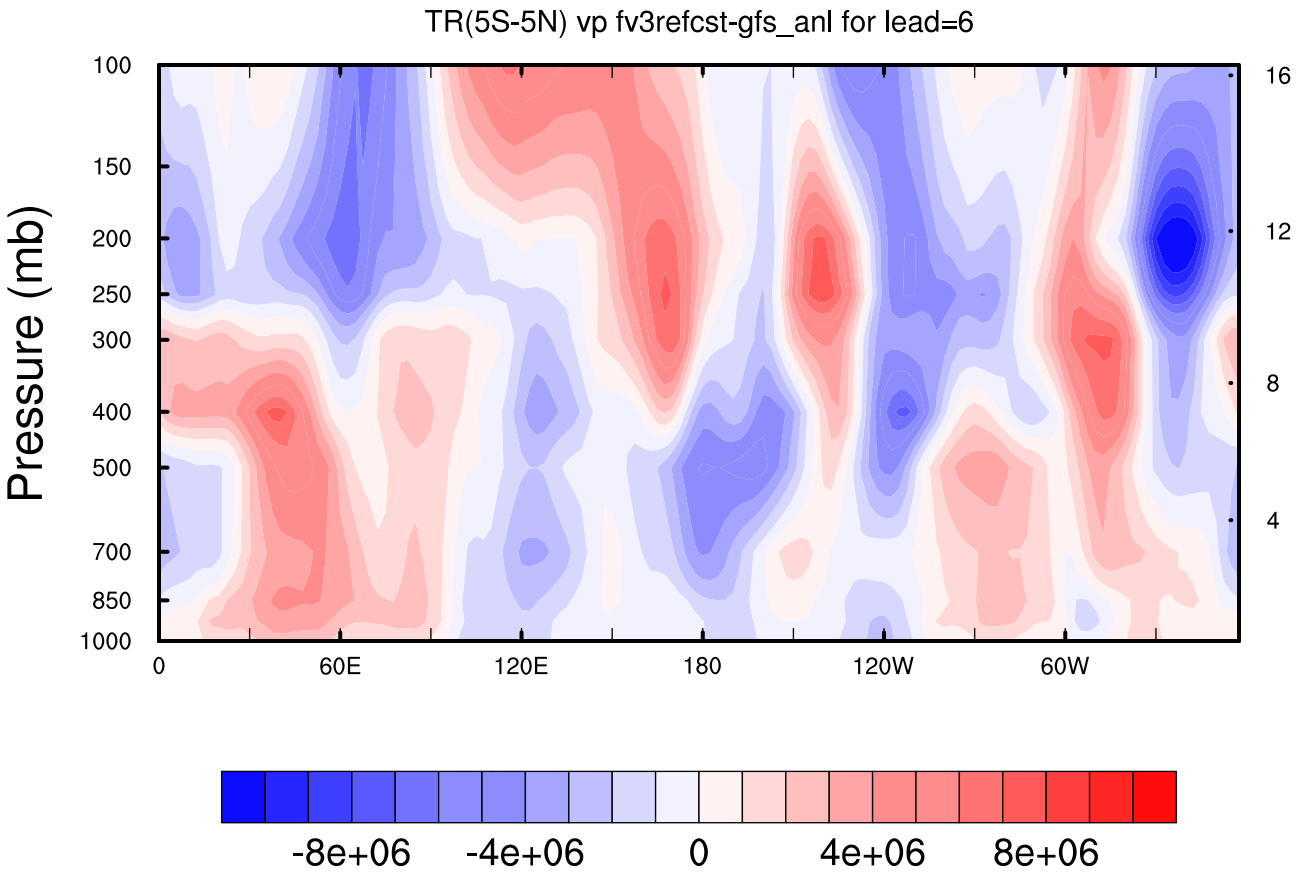

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

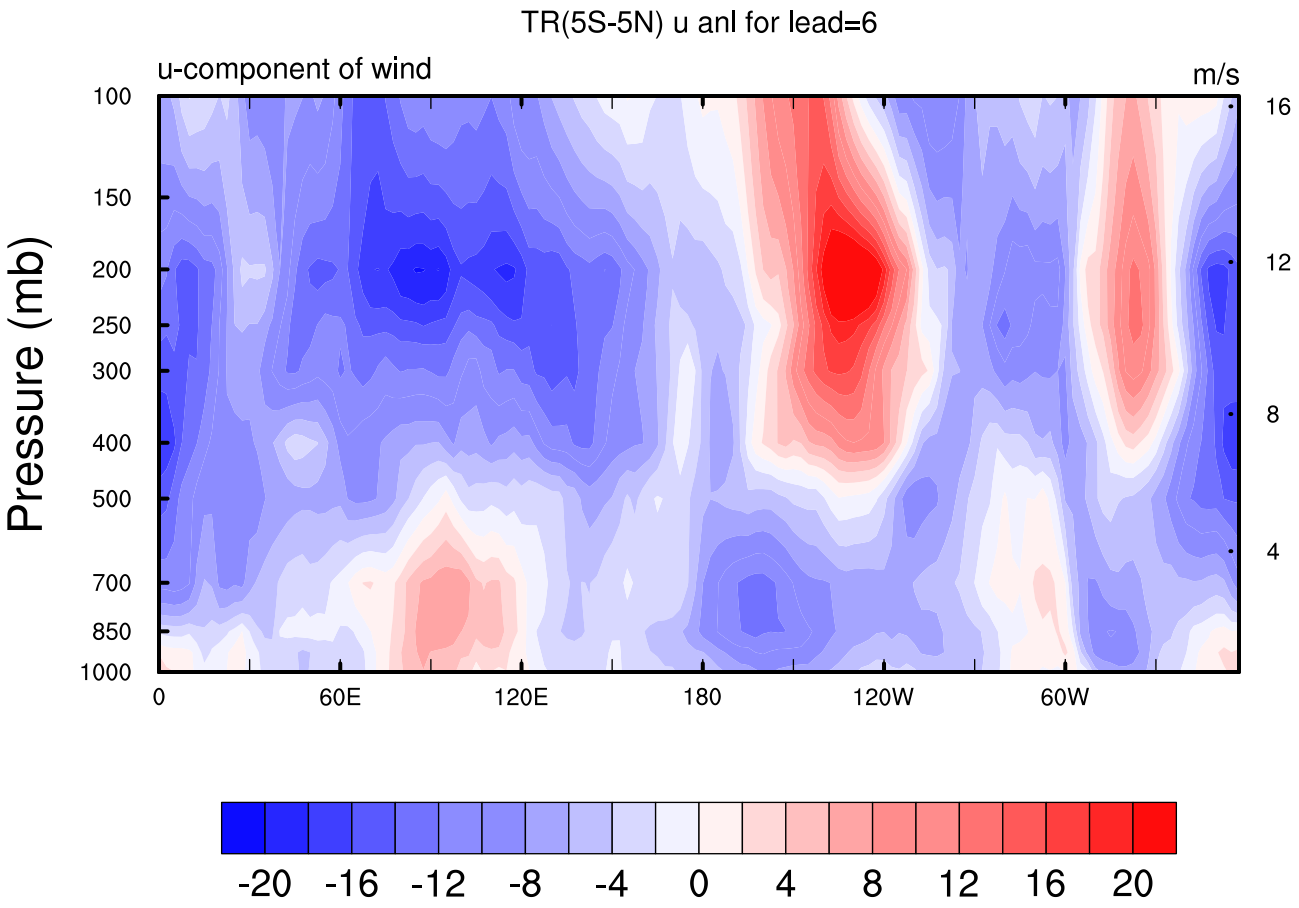

TR(5S-5N) vp anl for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

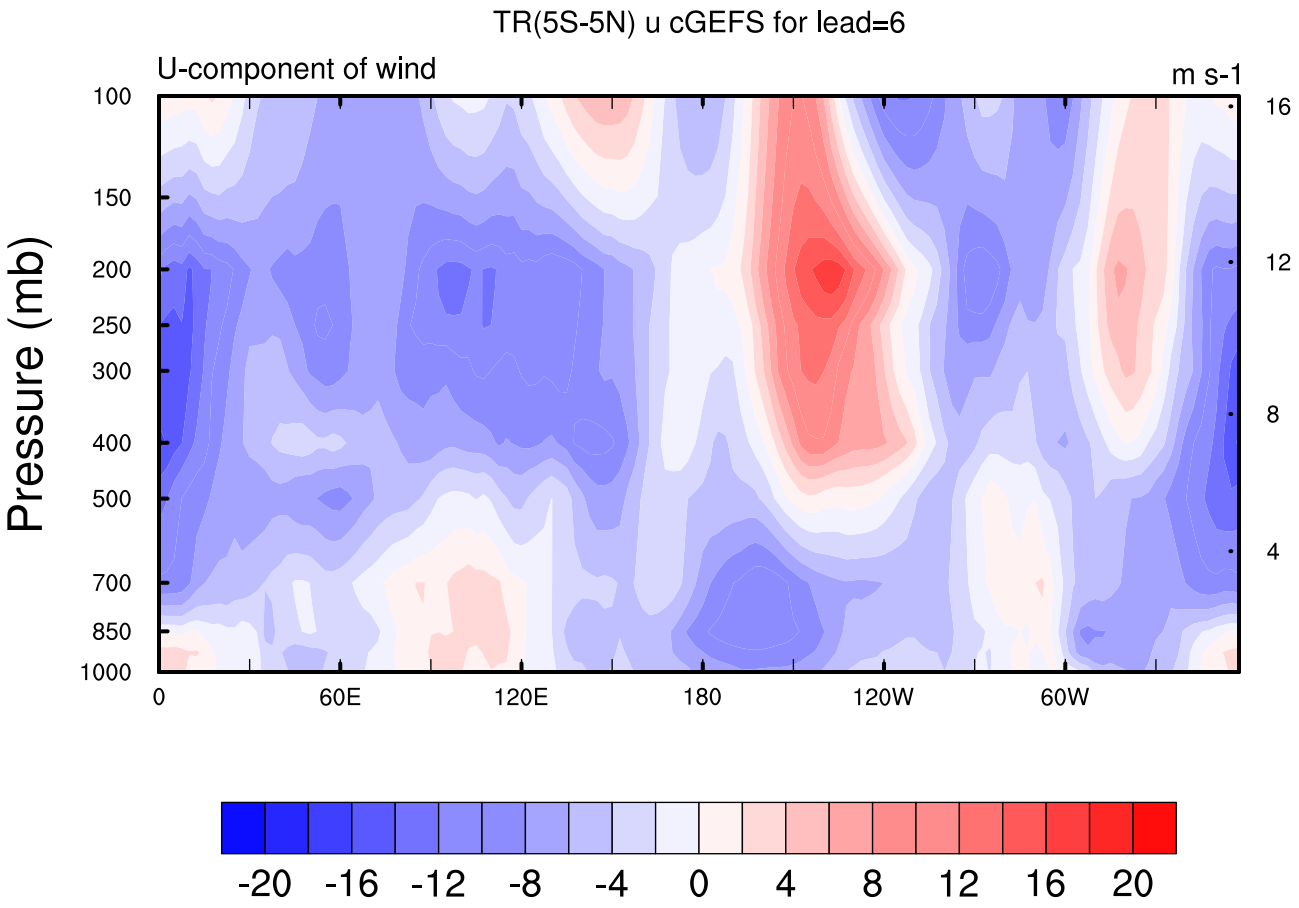

TR(5S-5N) vp cGEFS for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

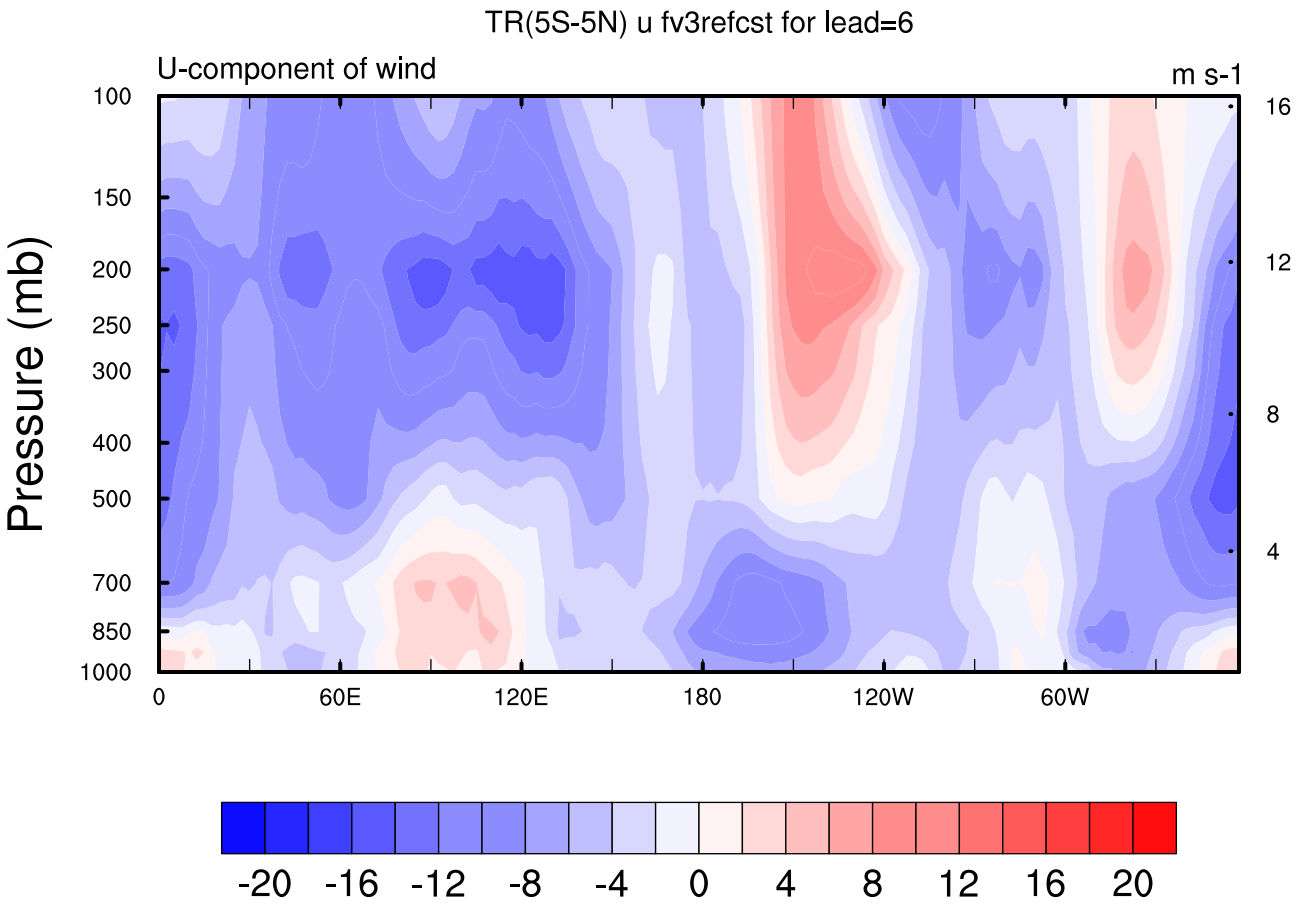

TR(5S-5N) vp fv3refcst for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

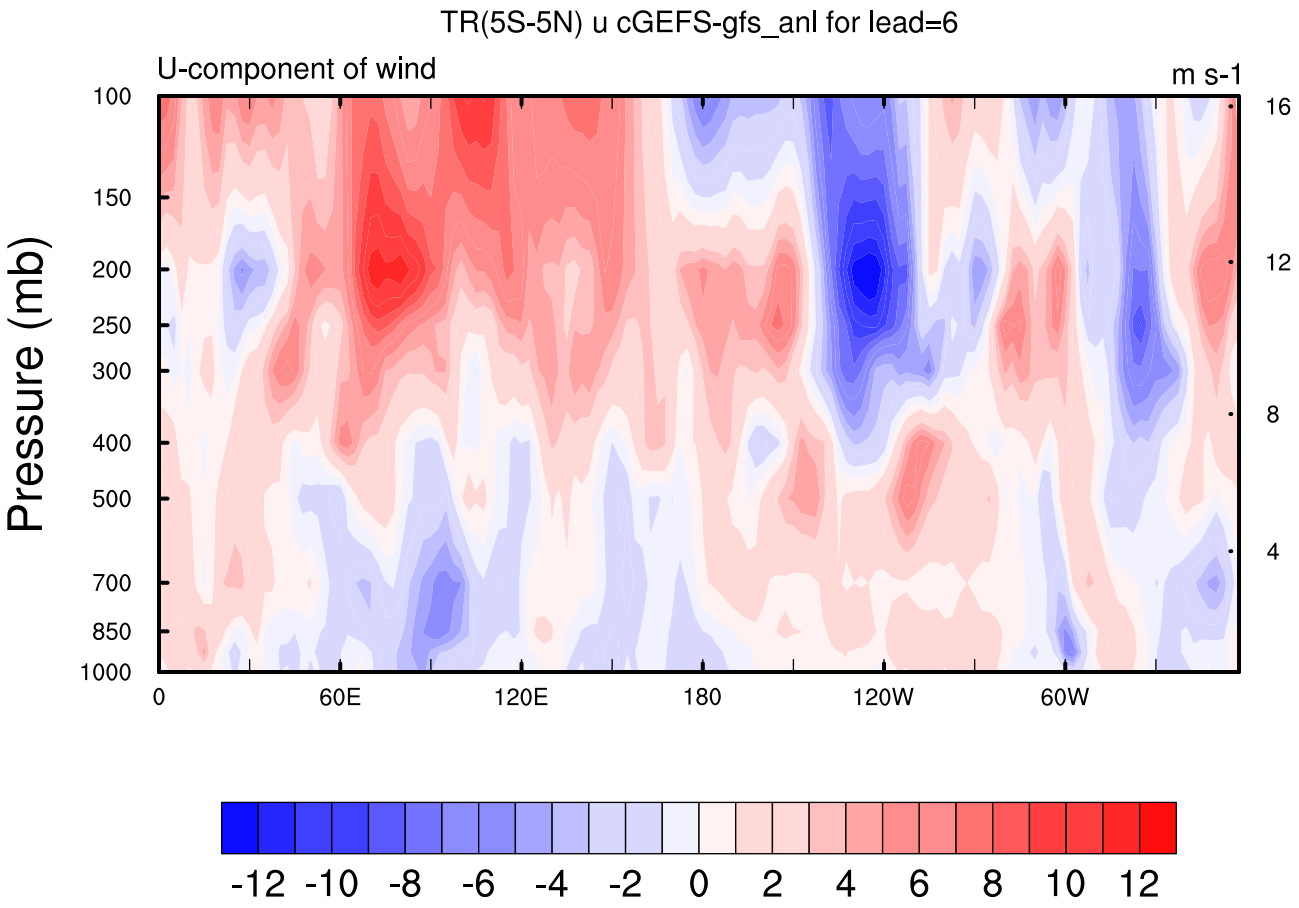

TR(5S-5N) vp cGEFS-gfs_anl for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst-gfs_anl for lead=6
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) u anl for lead=6
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS for lead=6
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u fv3refcst for lead=6
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=6
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
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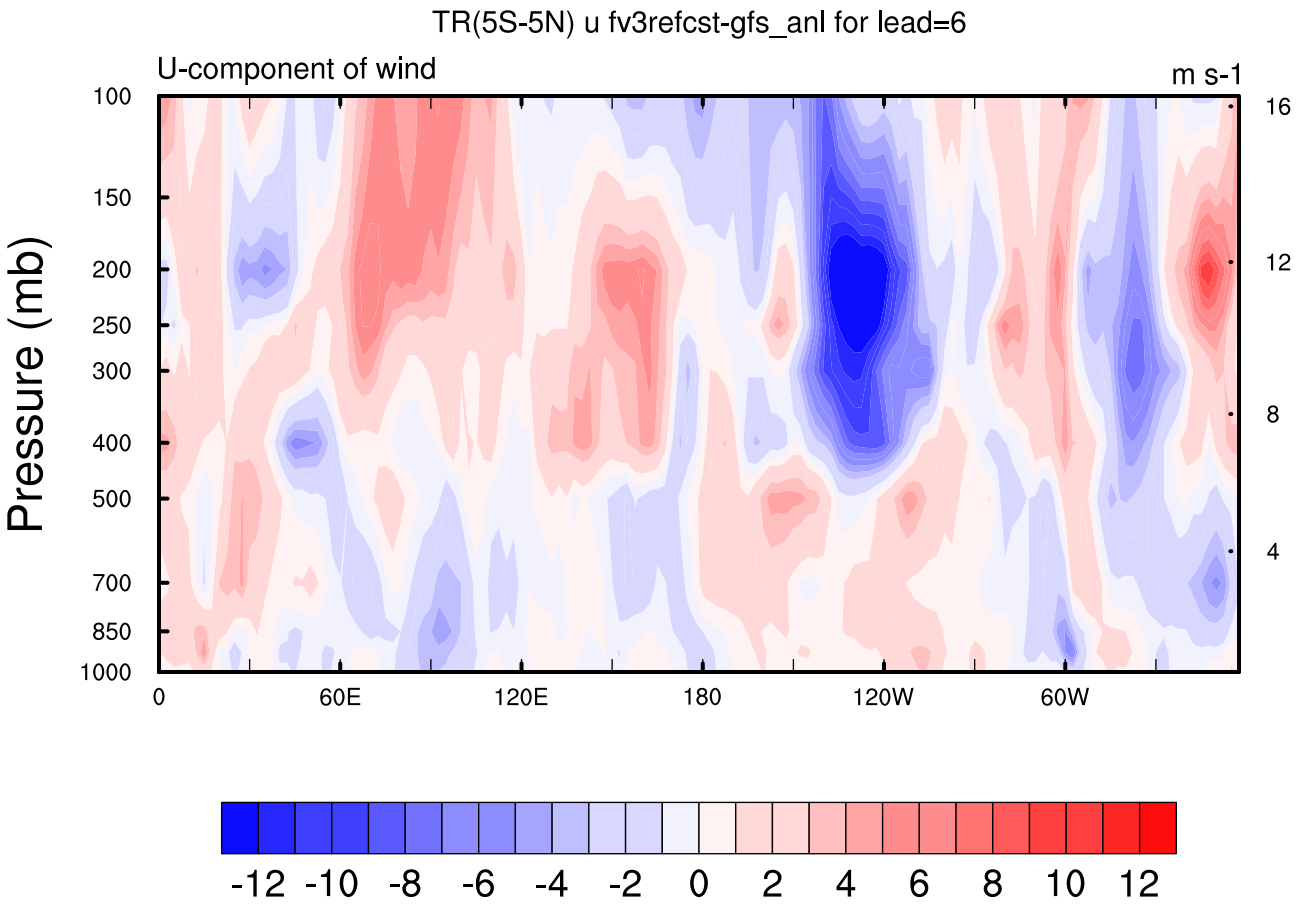
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=6
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
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4
-12
-10
-8
-6
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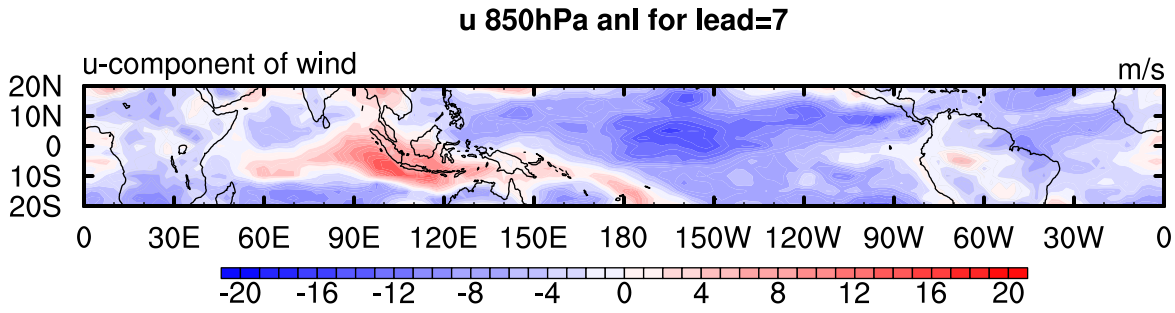
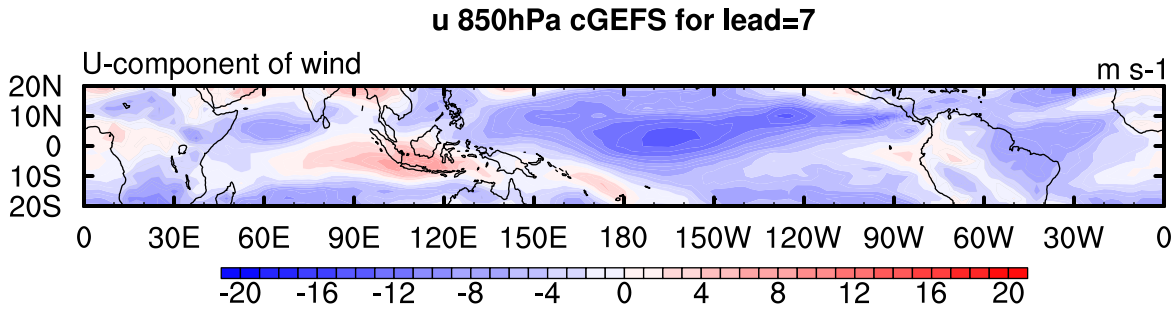
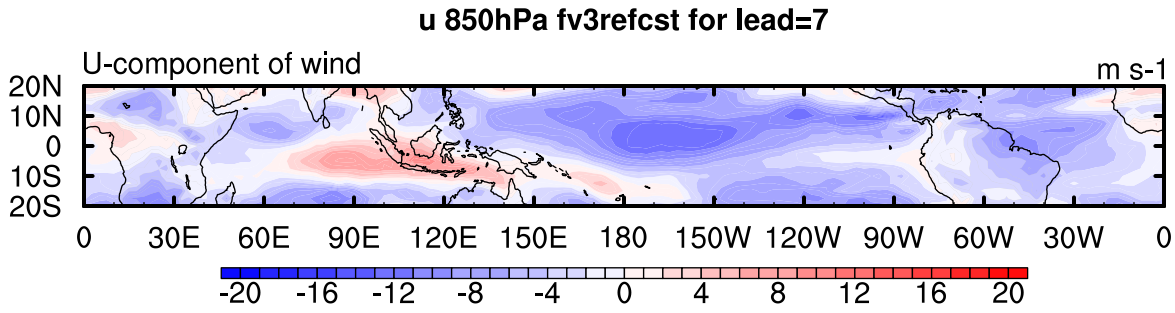
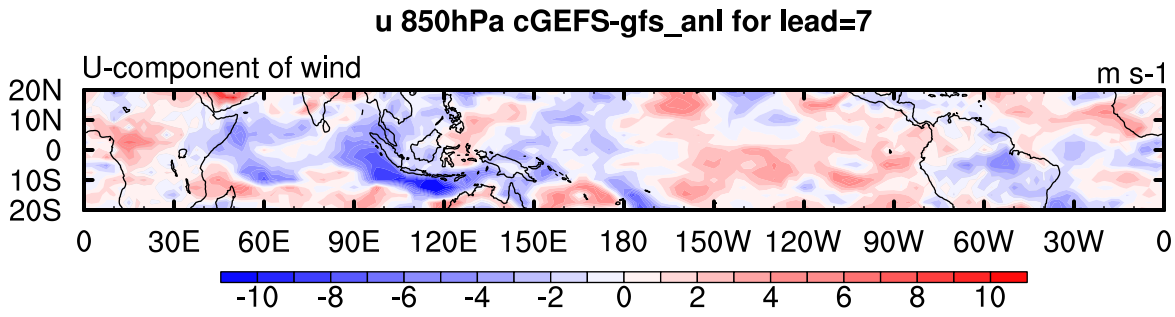
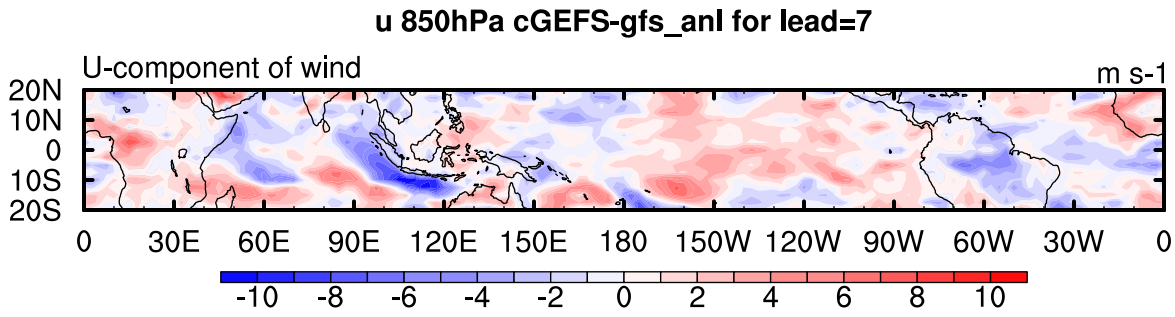
-2
0
2
4
6
8
10
12

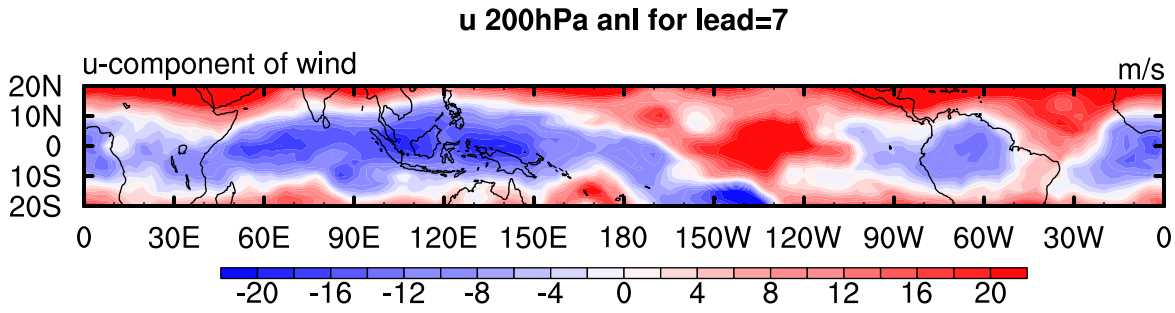

u 850hPa anl for lead=7
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

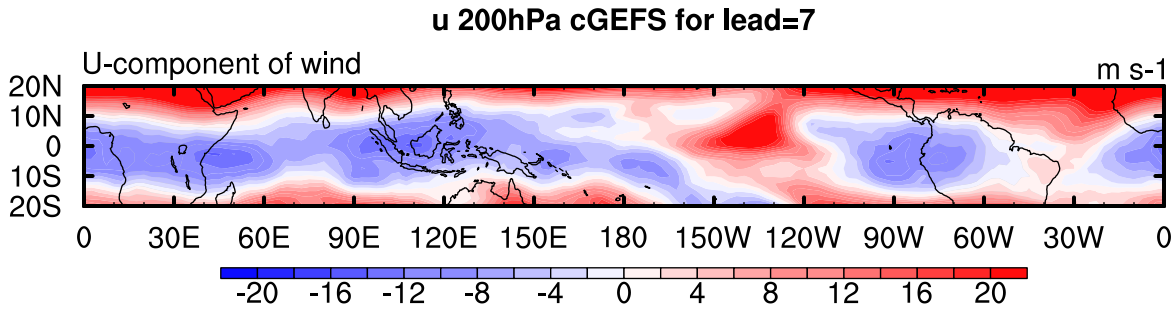

u 850hPa cGEFS for lead=7
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

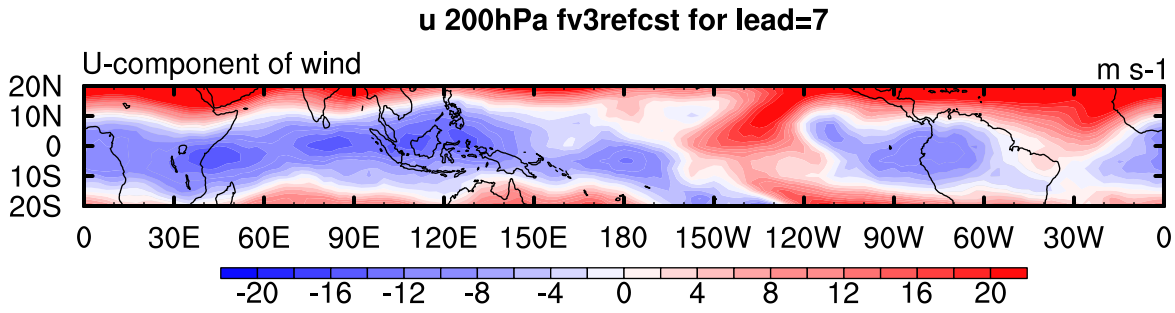

u 850hPa fv3refcst for lead=7
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=7
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 850hPa cGEFS-gfs_anl for lead=7
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=7
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=7
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=7
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-20
-16
-12
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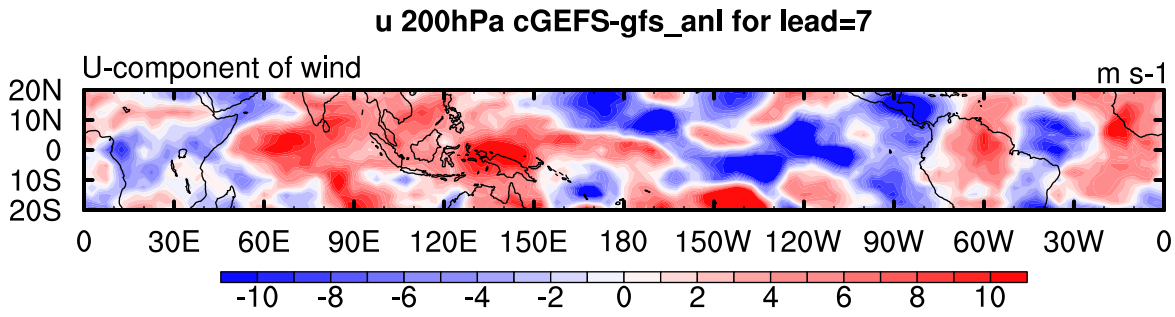
-4
0
4
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=7
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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-10
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-4
-2
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2
4
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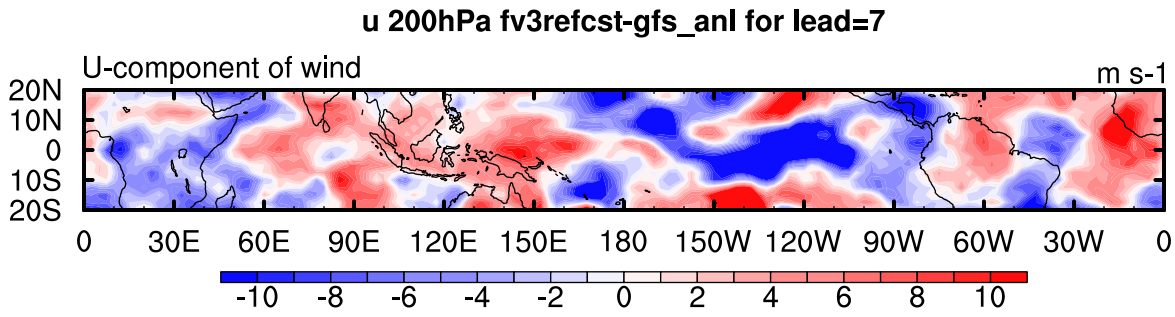
u 200hPa fv3refcst-gfs_anl for lead=7
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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-10
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-4
-2
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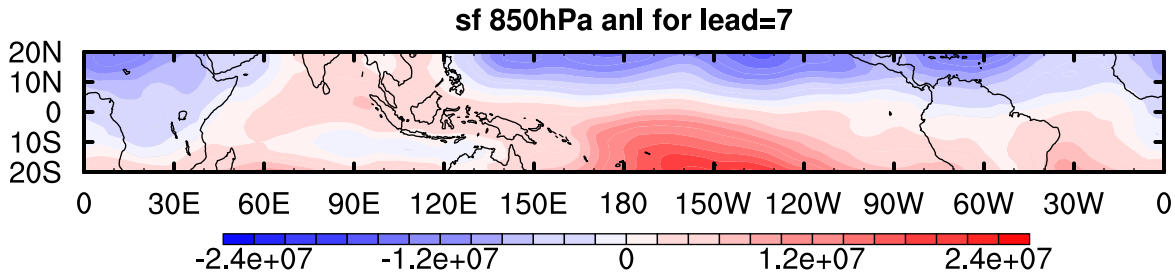
2
4
6
8
10


sf 850hPa anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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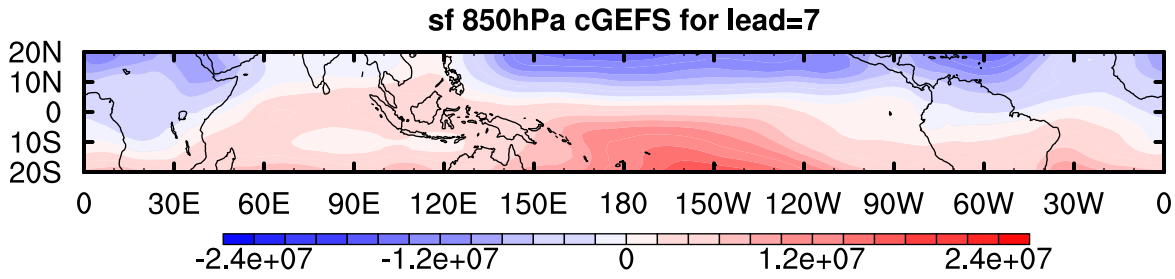
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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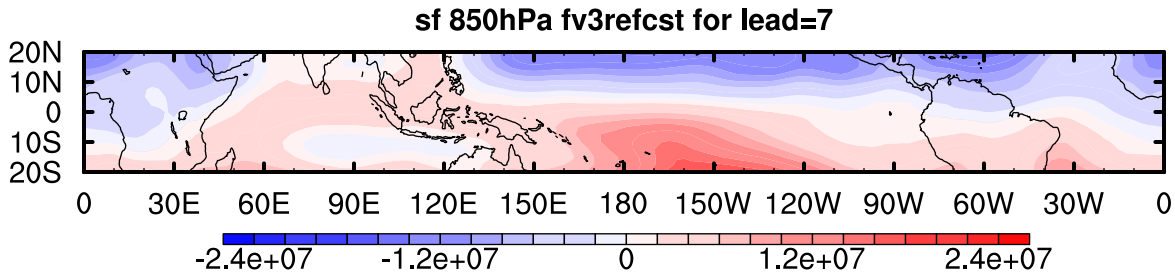
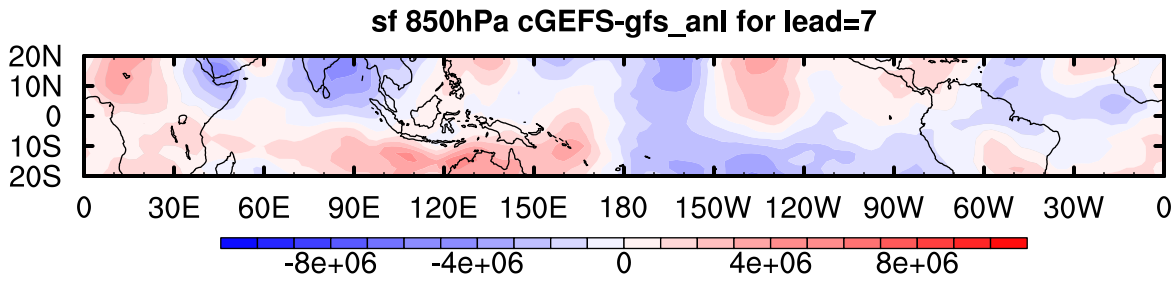
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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180
150W
120W
90W
60W
30W
0
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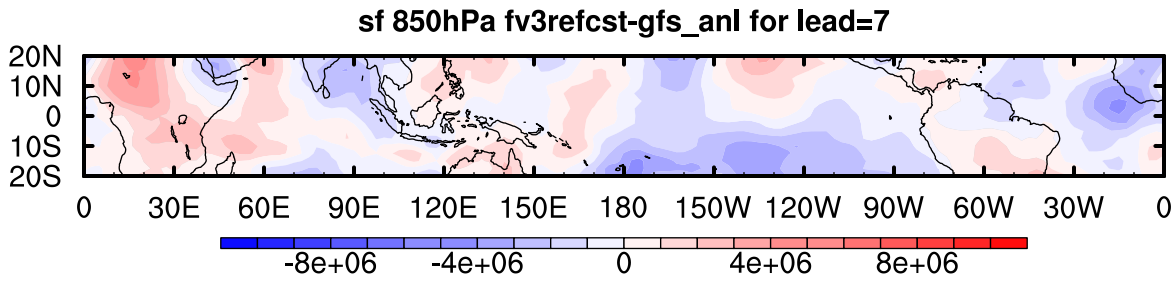
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
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120W
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30W
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-4e+06
0
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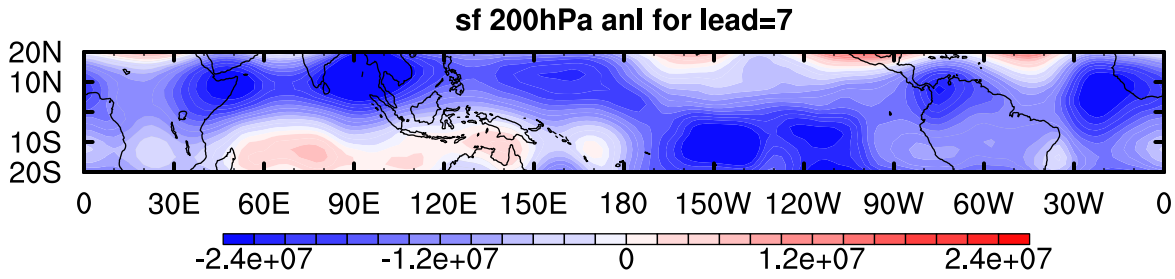
8e+06


sf 200hPa anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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30W
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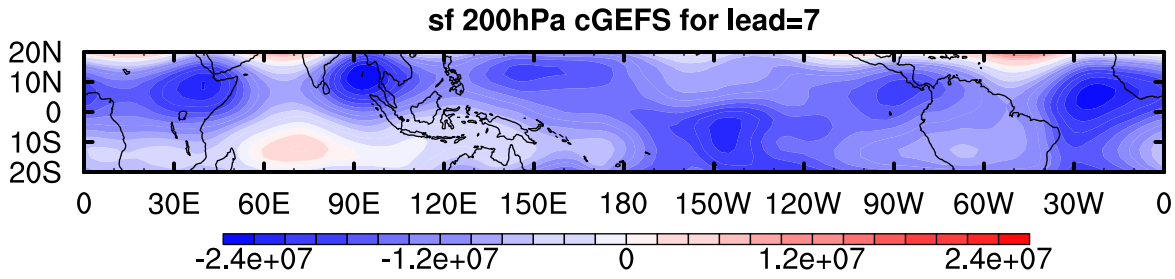
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS for lead=7
20N
10N
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10S
20S
0
30E
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90E
120E
150E
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60W
30W
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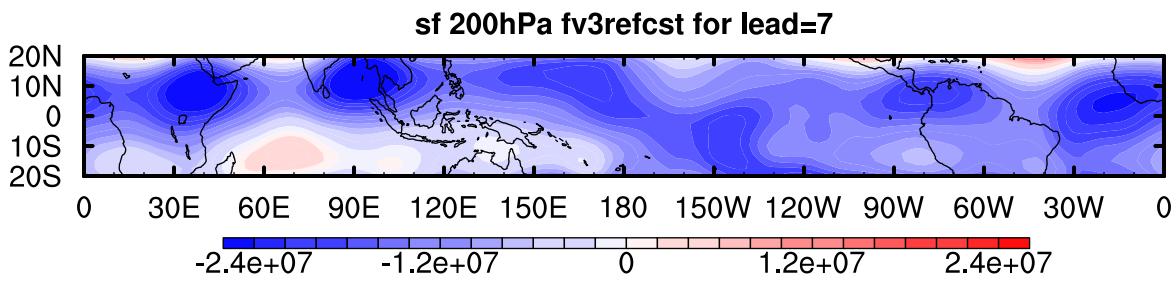
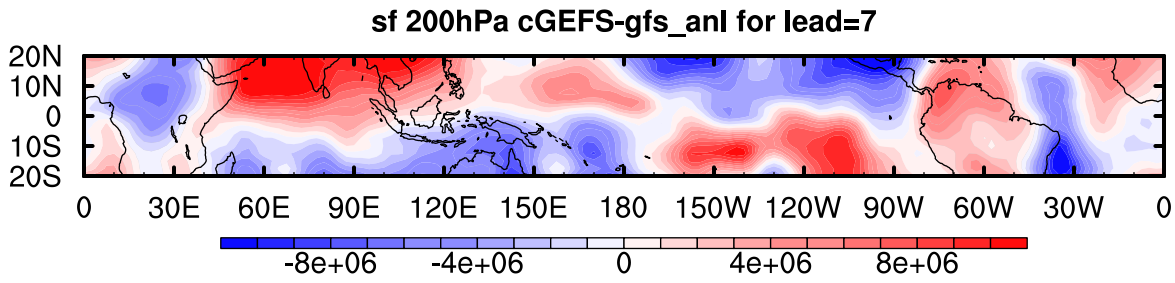
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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180
150W
120W
90W
60W
30W
0
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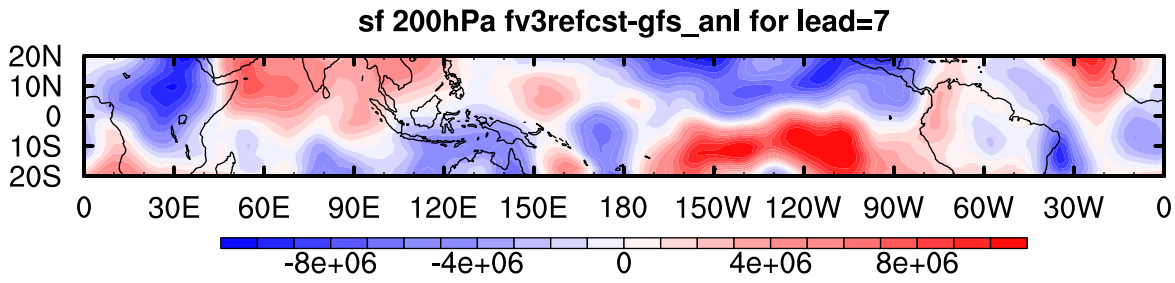
-4e+06
0
4e+06
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
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30W
0
-8e+06
-4e+06
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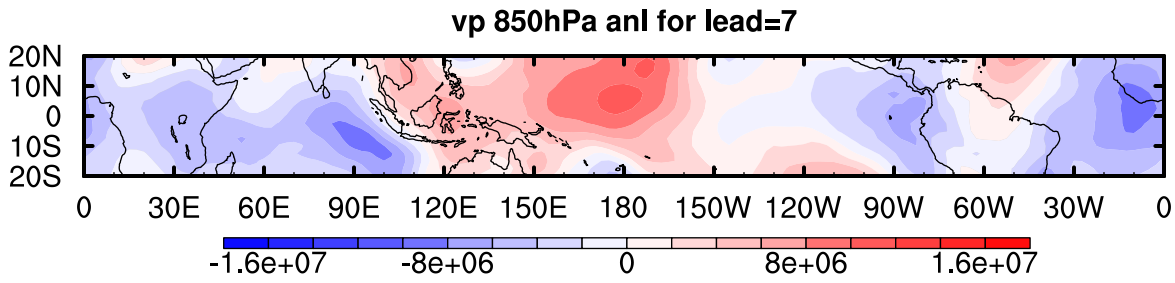
4e+06
8e+06


vp 850hPa anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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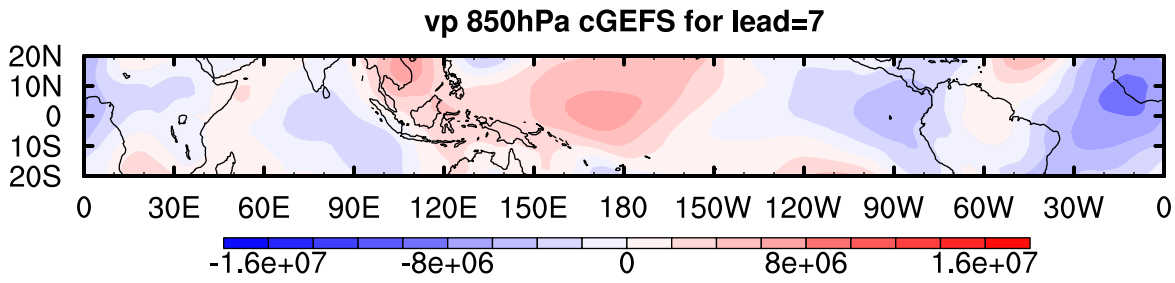
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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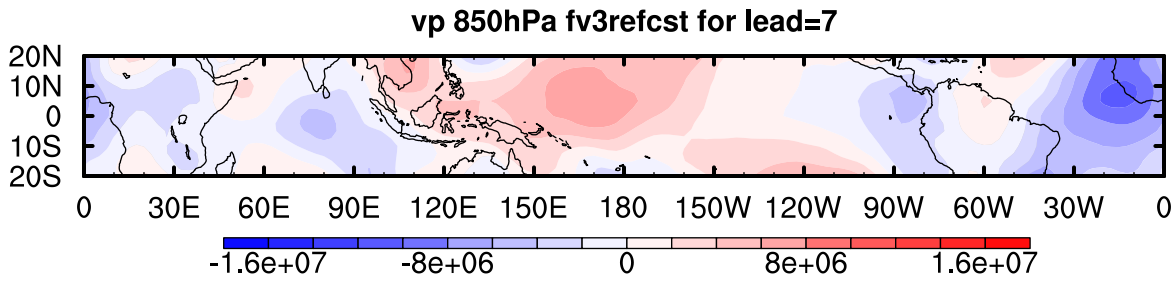
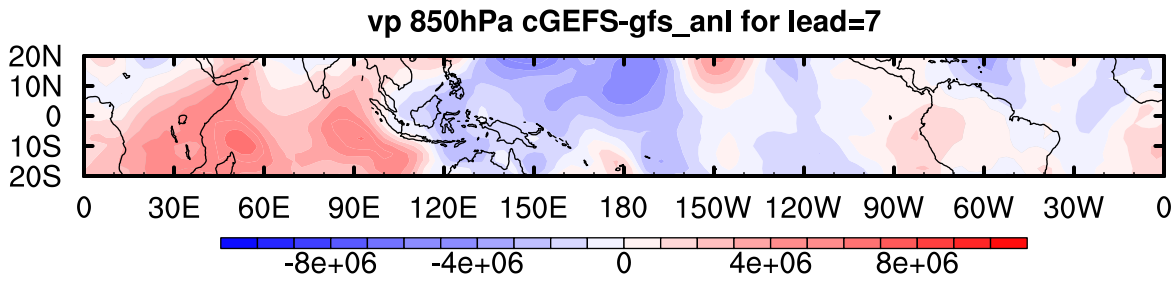
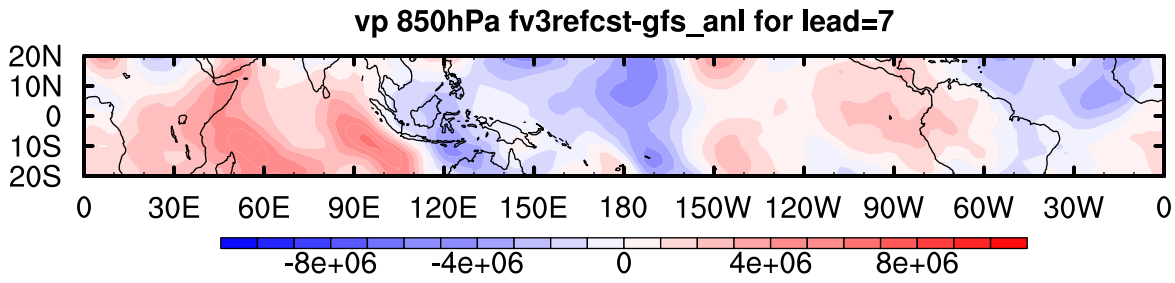
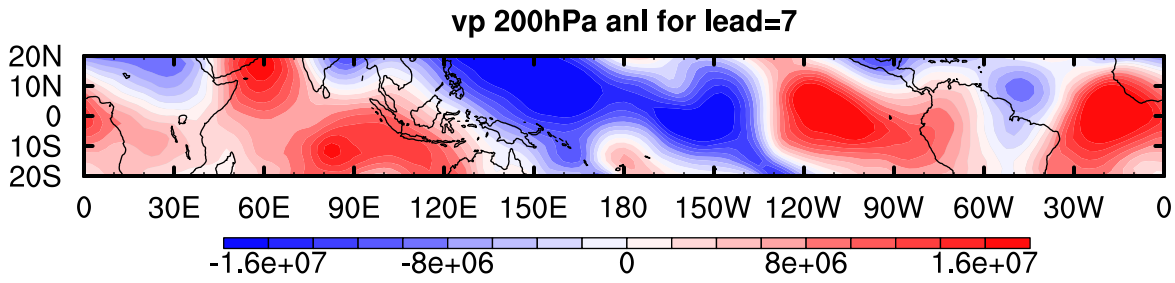
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 200hPa anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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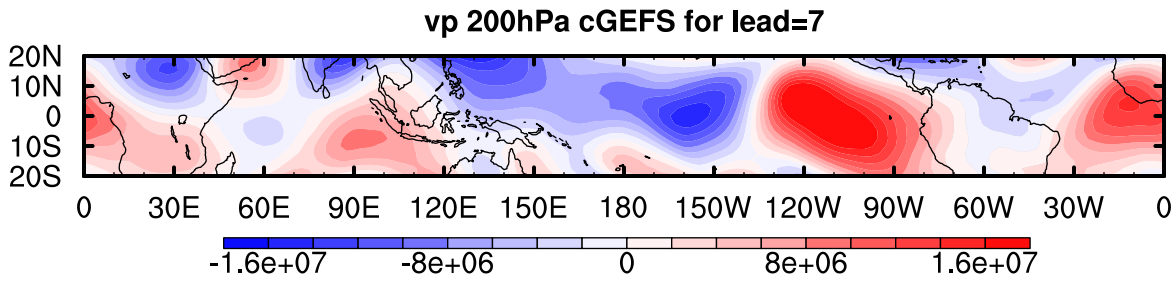
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa cGEFS for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
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60W
30W
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-1.6e+07
-8e+06
0
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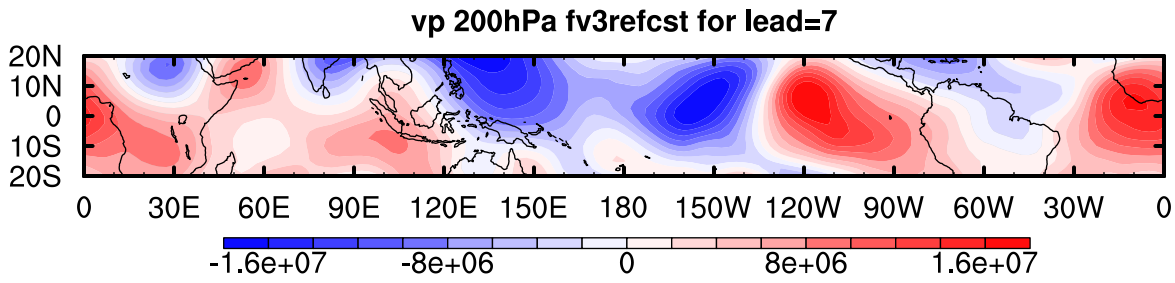
1.6e+07


vp 200hPa fv3refcst for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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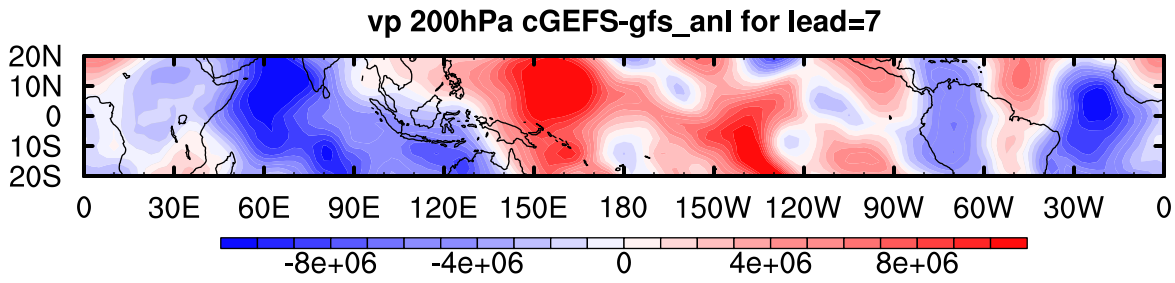
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa cGEFS-gfs_anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
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180
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120W
90W
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30W
0
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-4e+06
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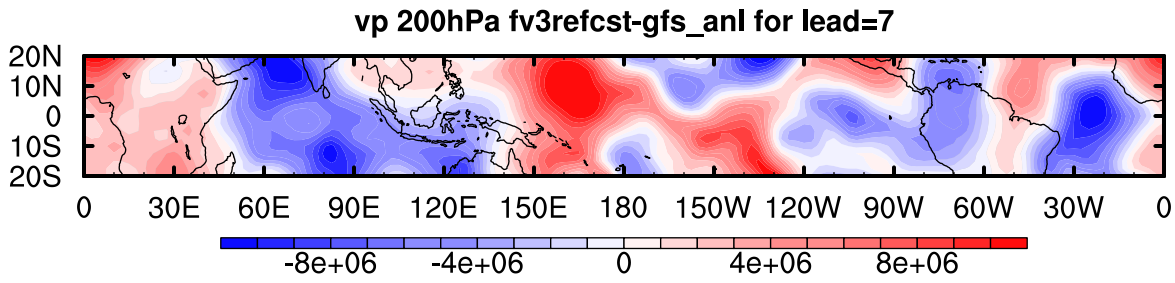
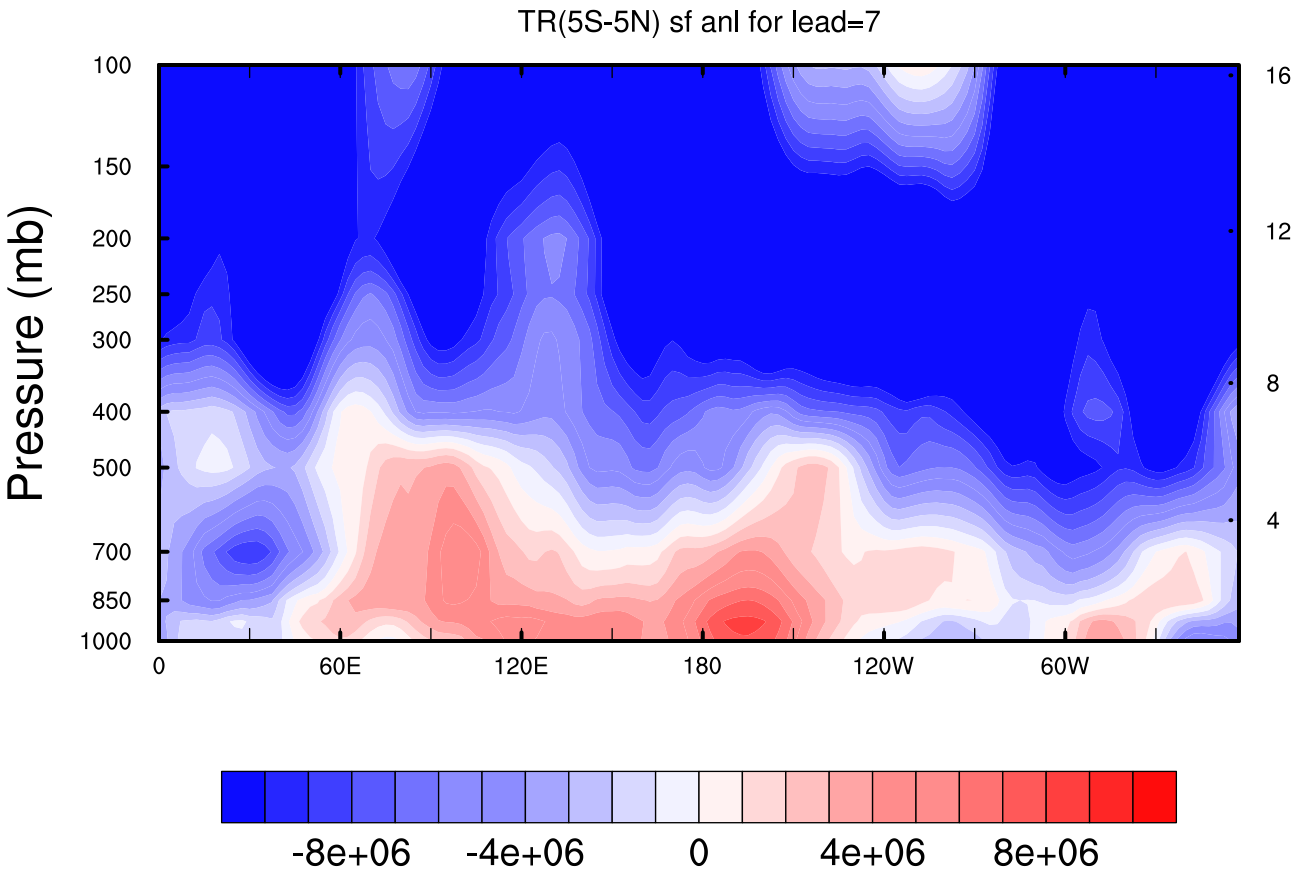
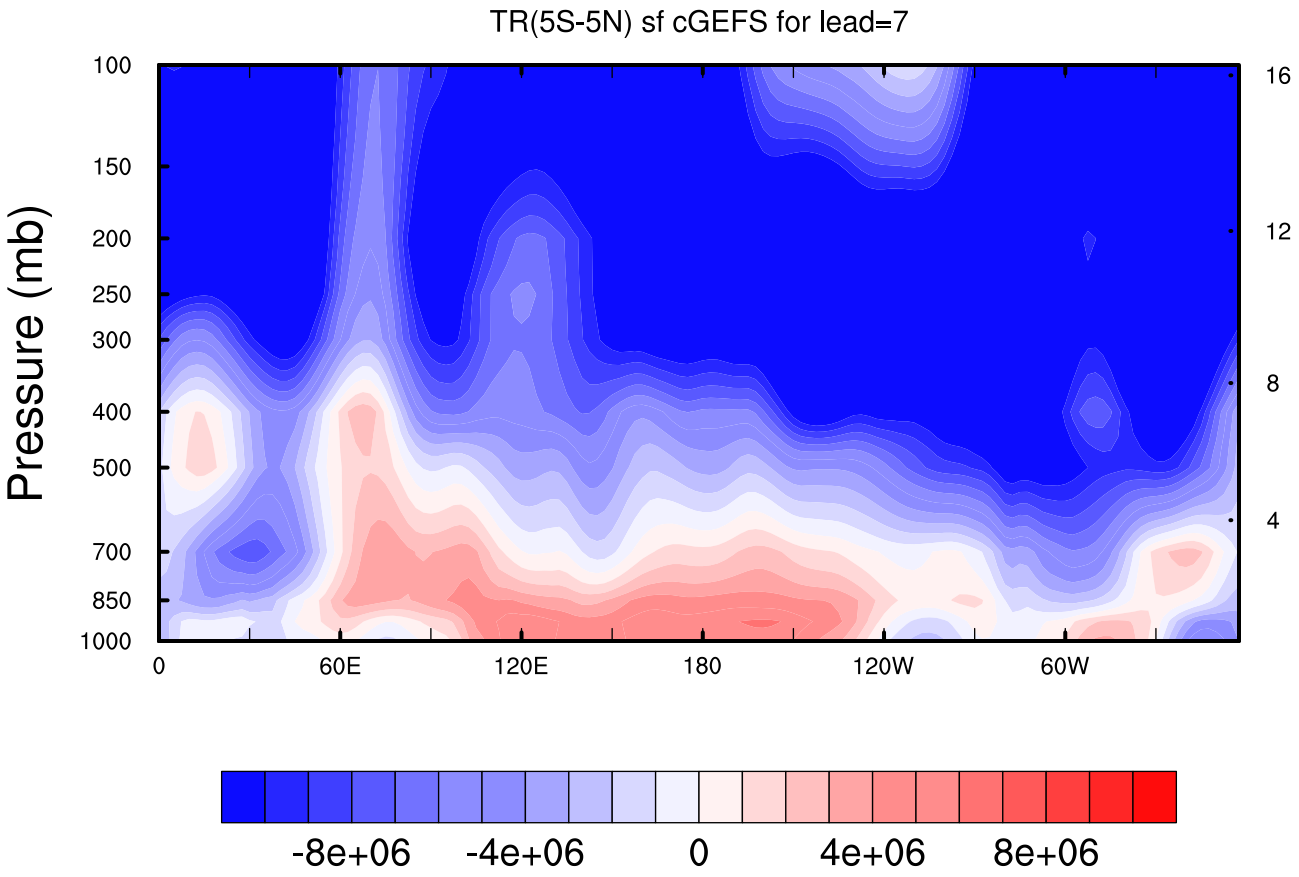
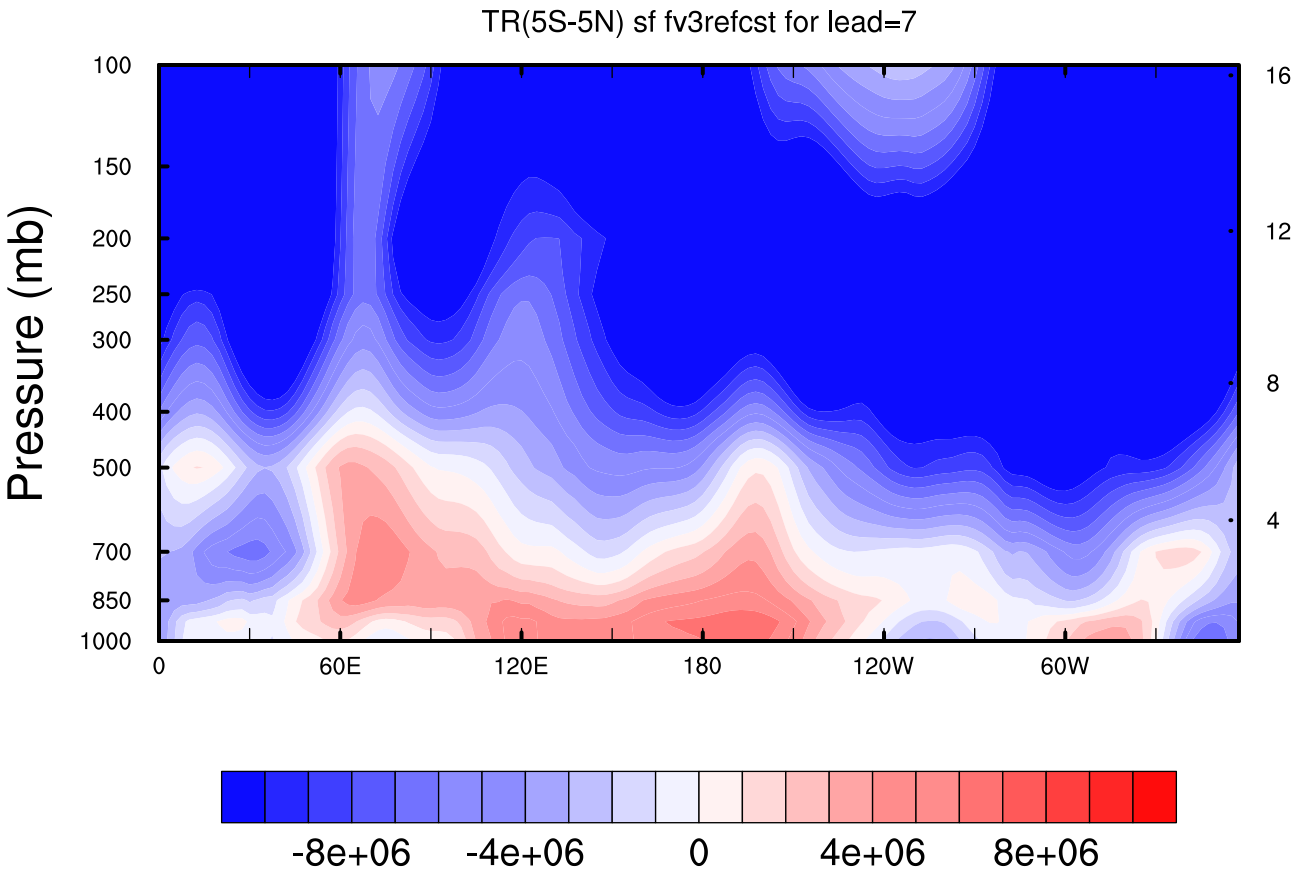
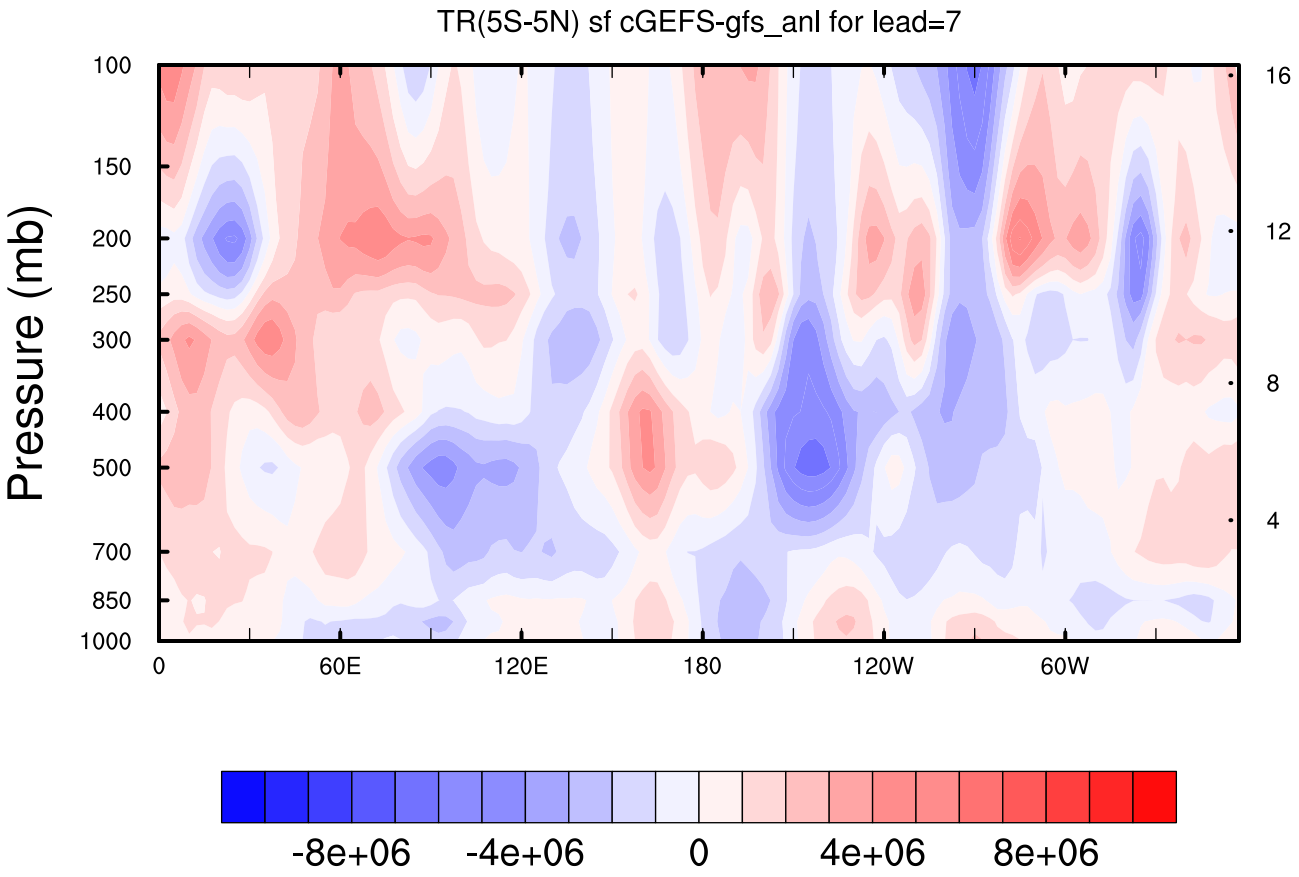
4e+06
8e+06

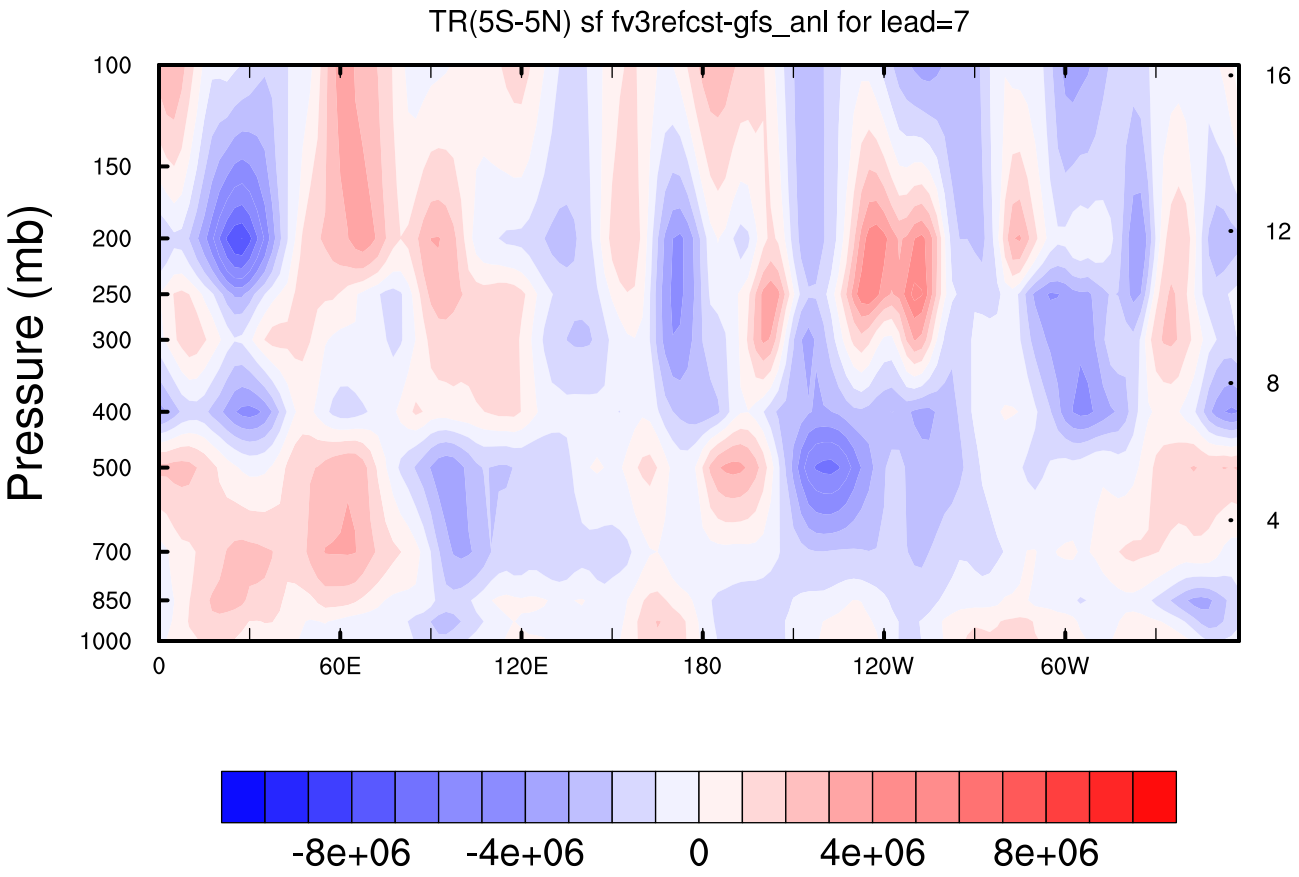

vp 200hPa fv3refcst-gfs_anl for lead=7
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

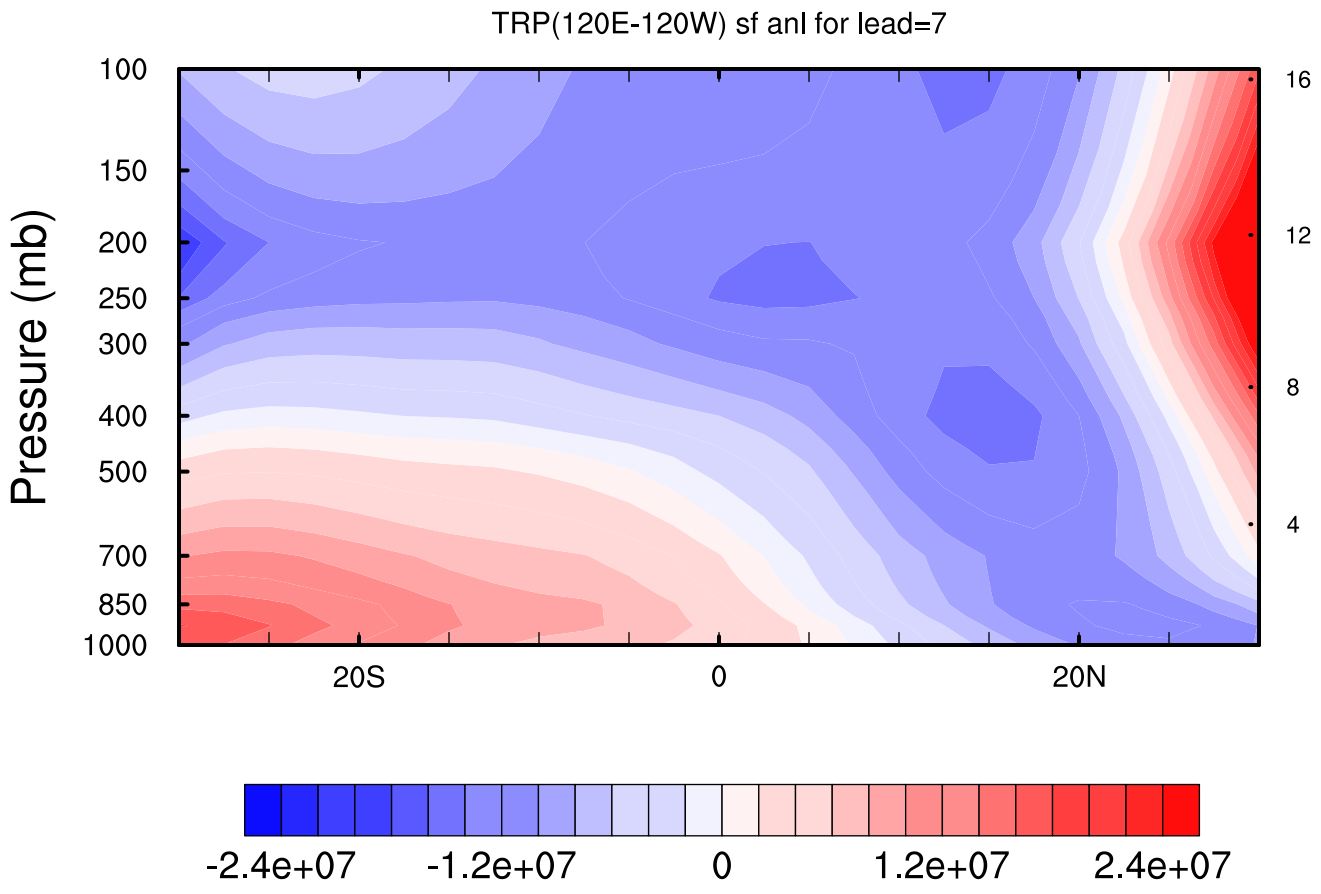

TR(5S-5N) sf anl for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

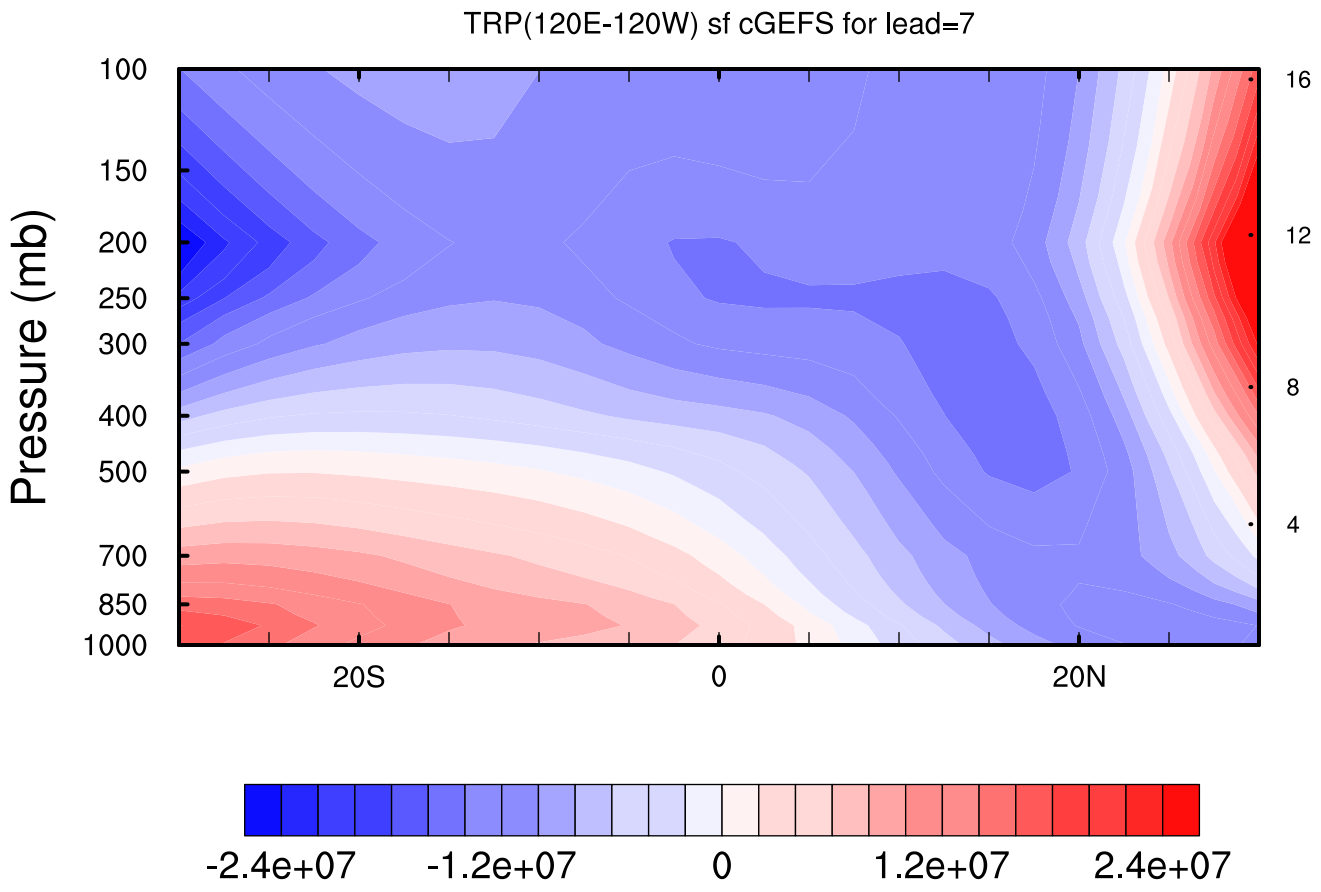

TR(5S-5N) sf cGEFS for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

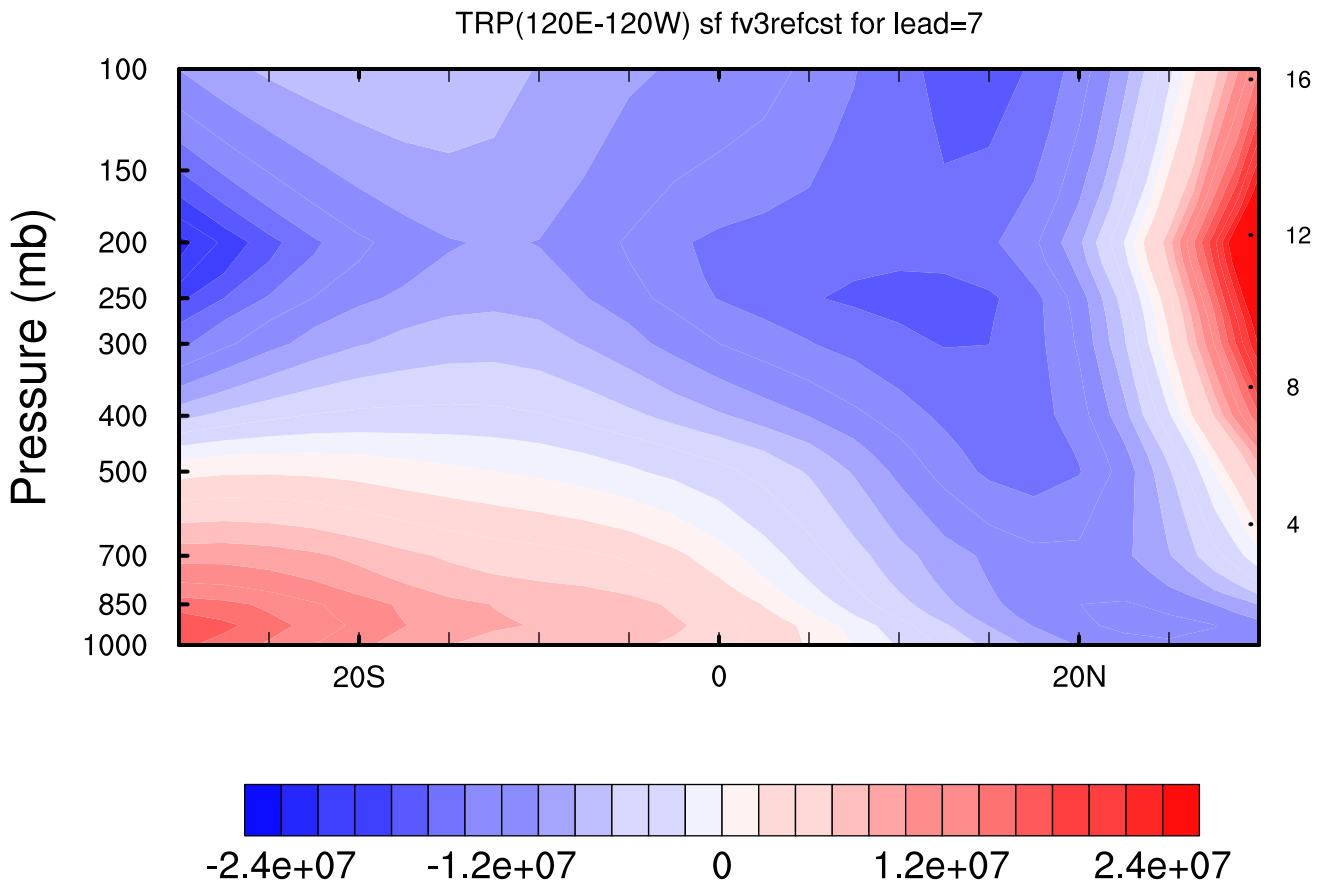

TR(5S-5N) sf fv3refcst for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

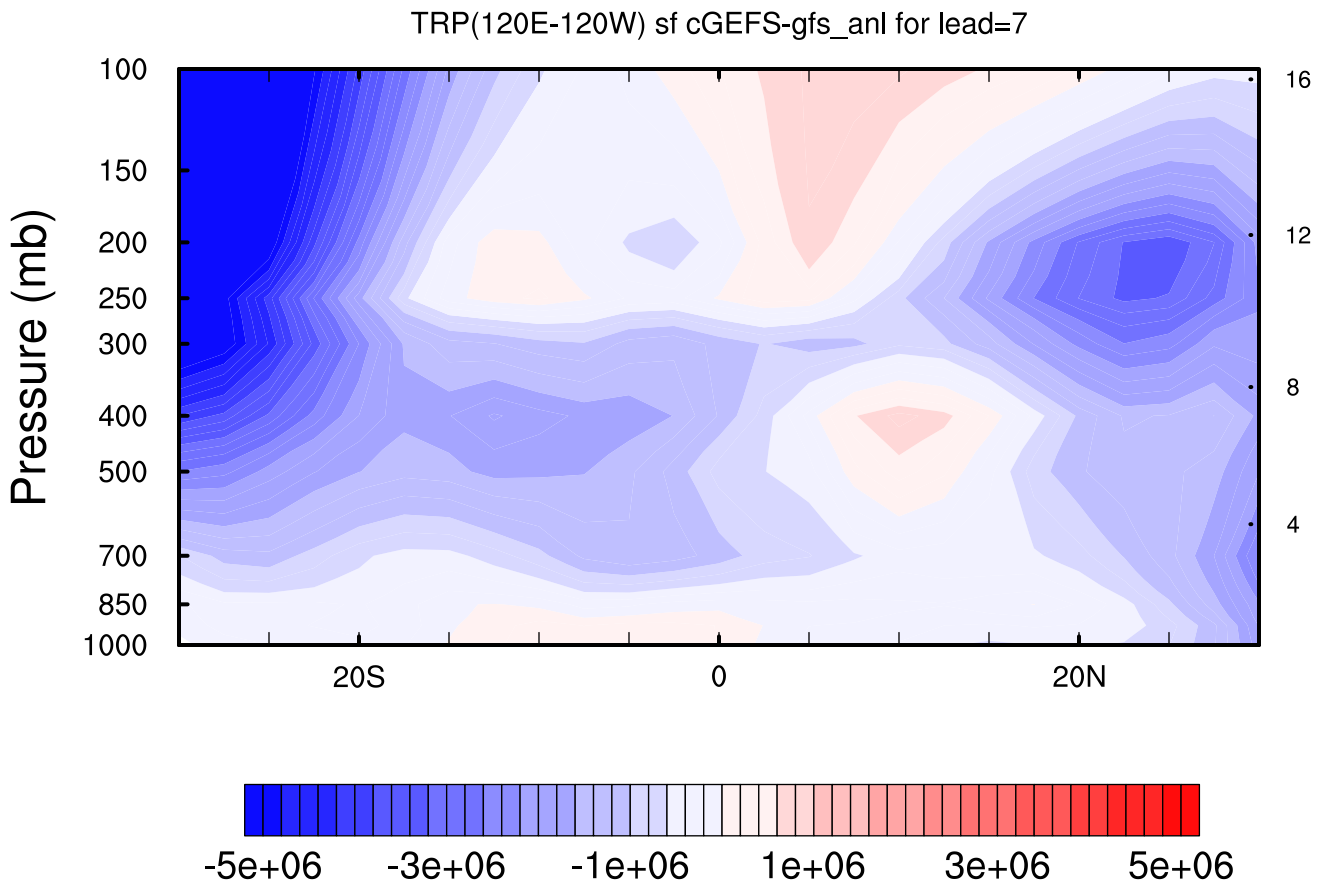

TR(5S-5N) sf cGEFS-gfs_anl for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

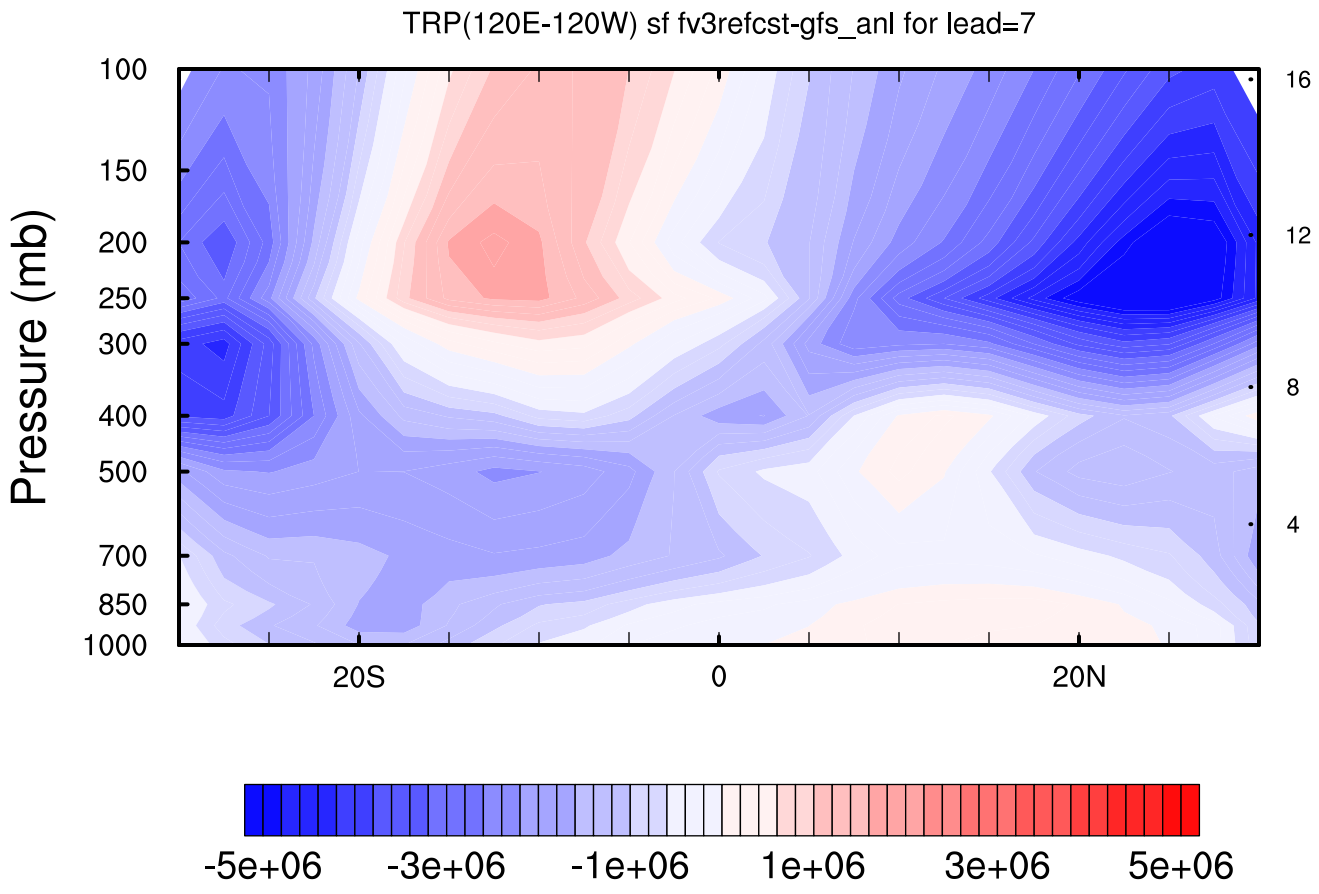

TR(5S-5N) sf fv3refcst-gfs_anl for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

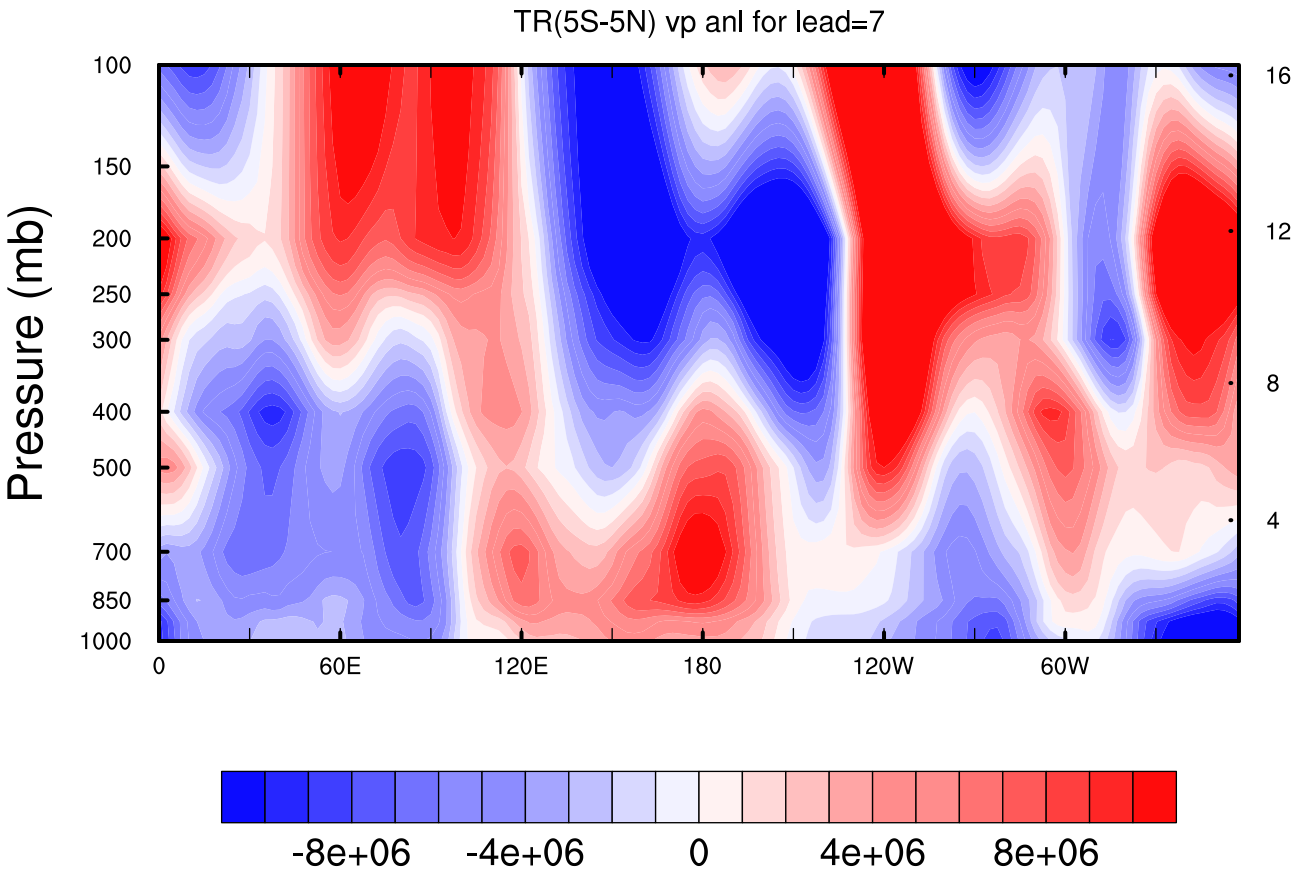

TRP(120E-120W) sf anl for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

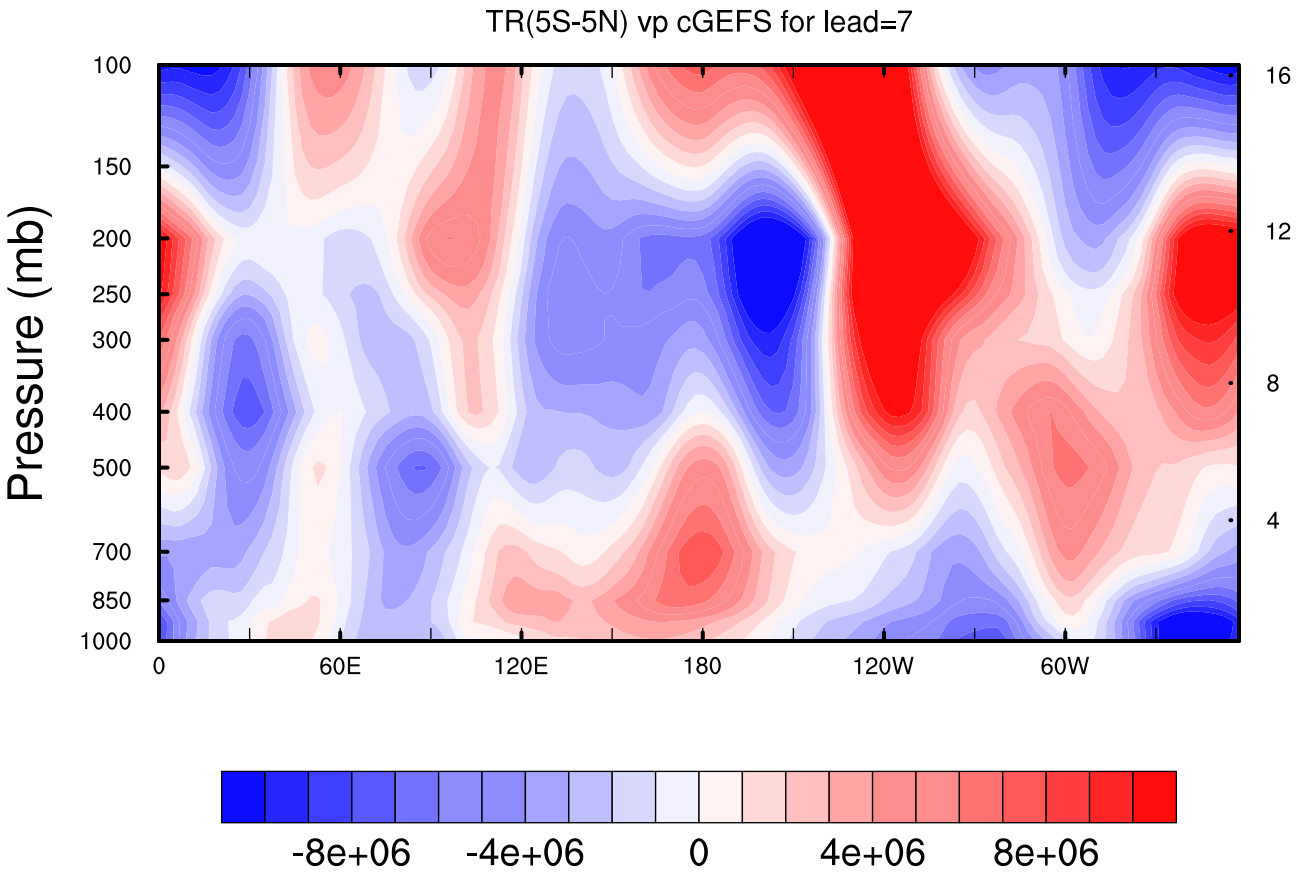

TRP(120E-120W) sf cGEFS for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

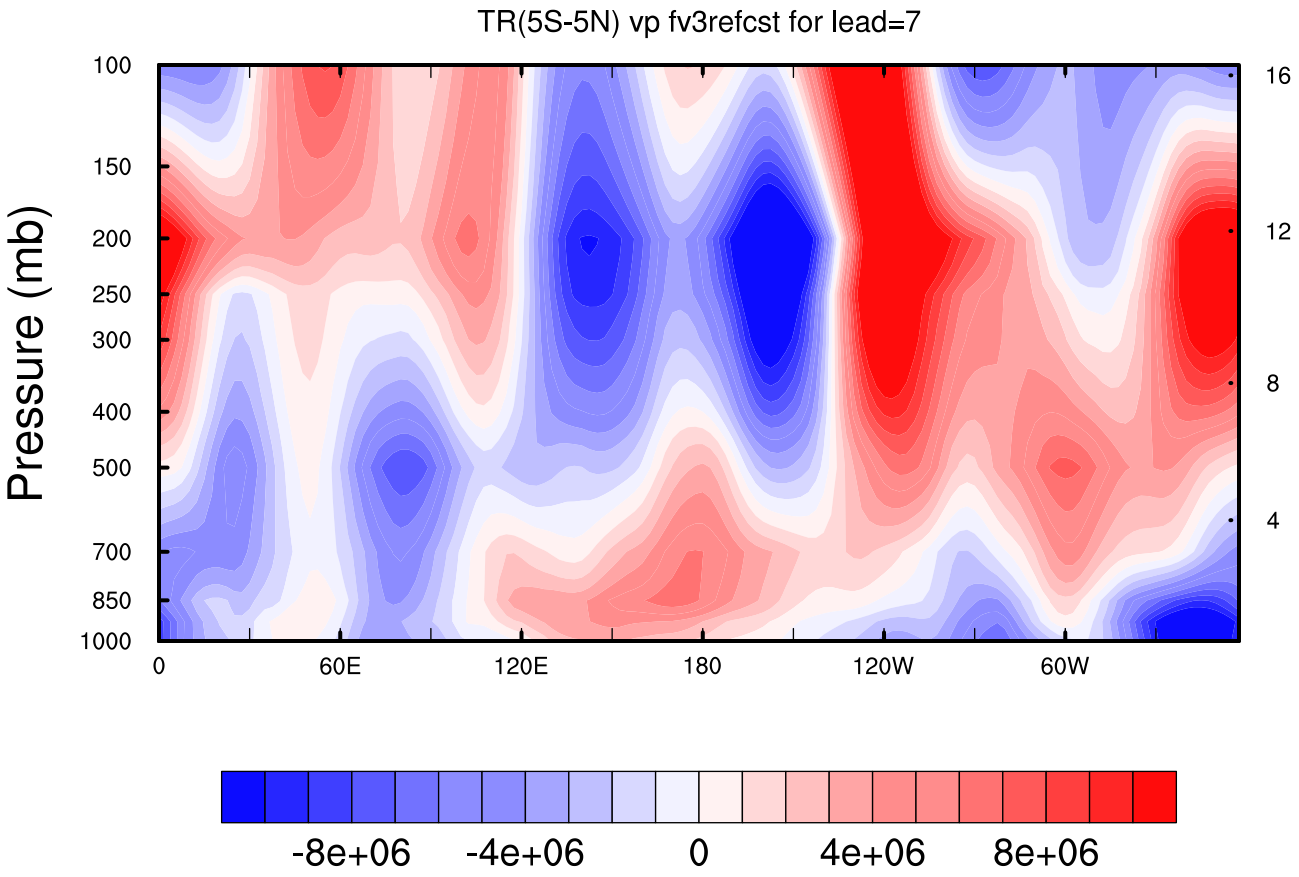

TRP(120E-120W) sf fv3refcst for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

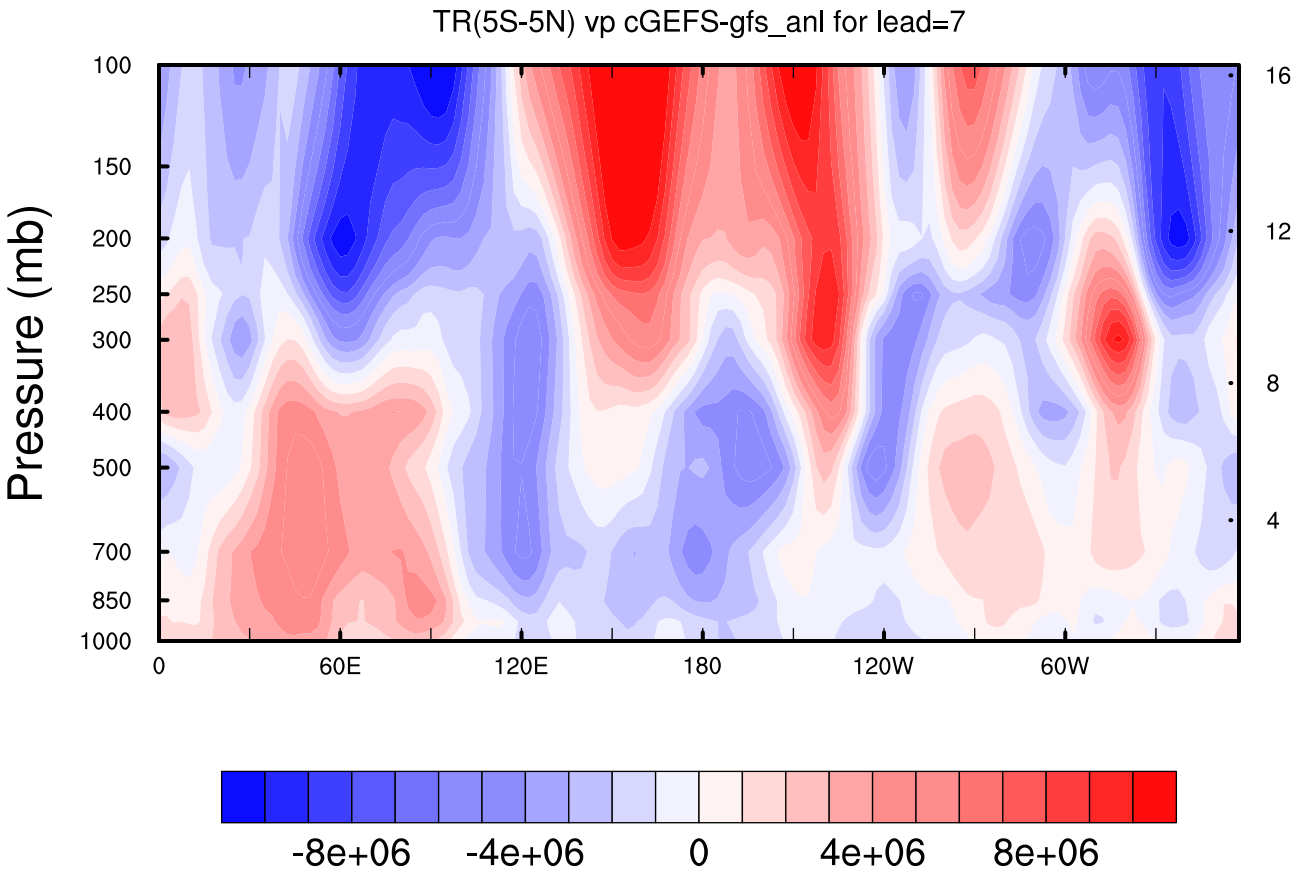

TRP(120E-120W) sf cGEFS-gfs_anl for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

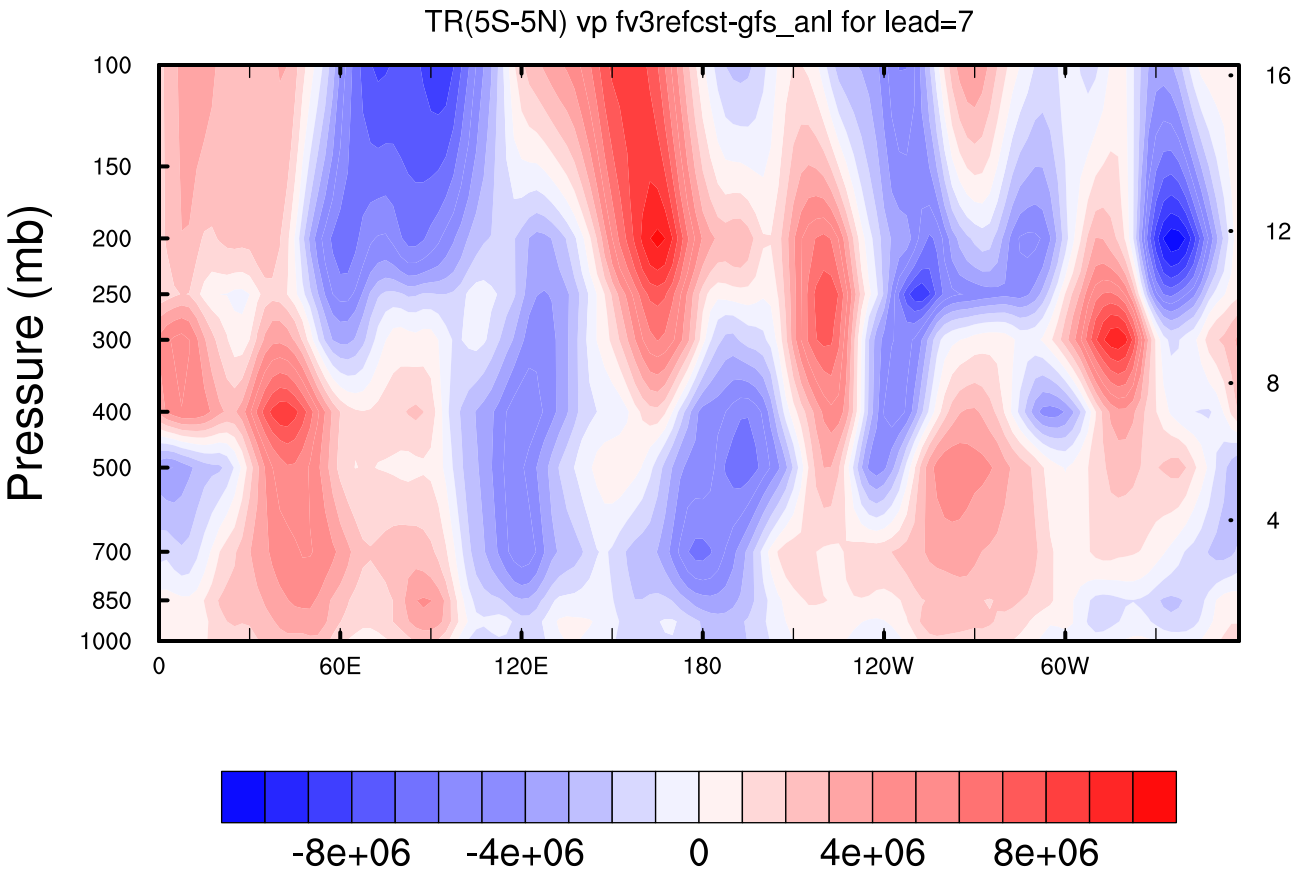

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

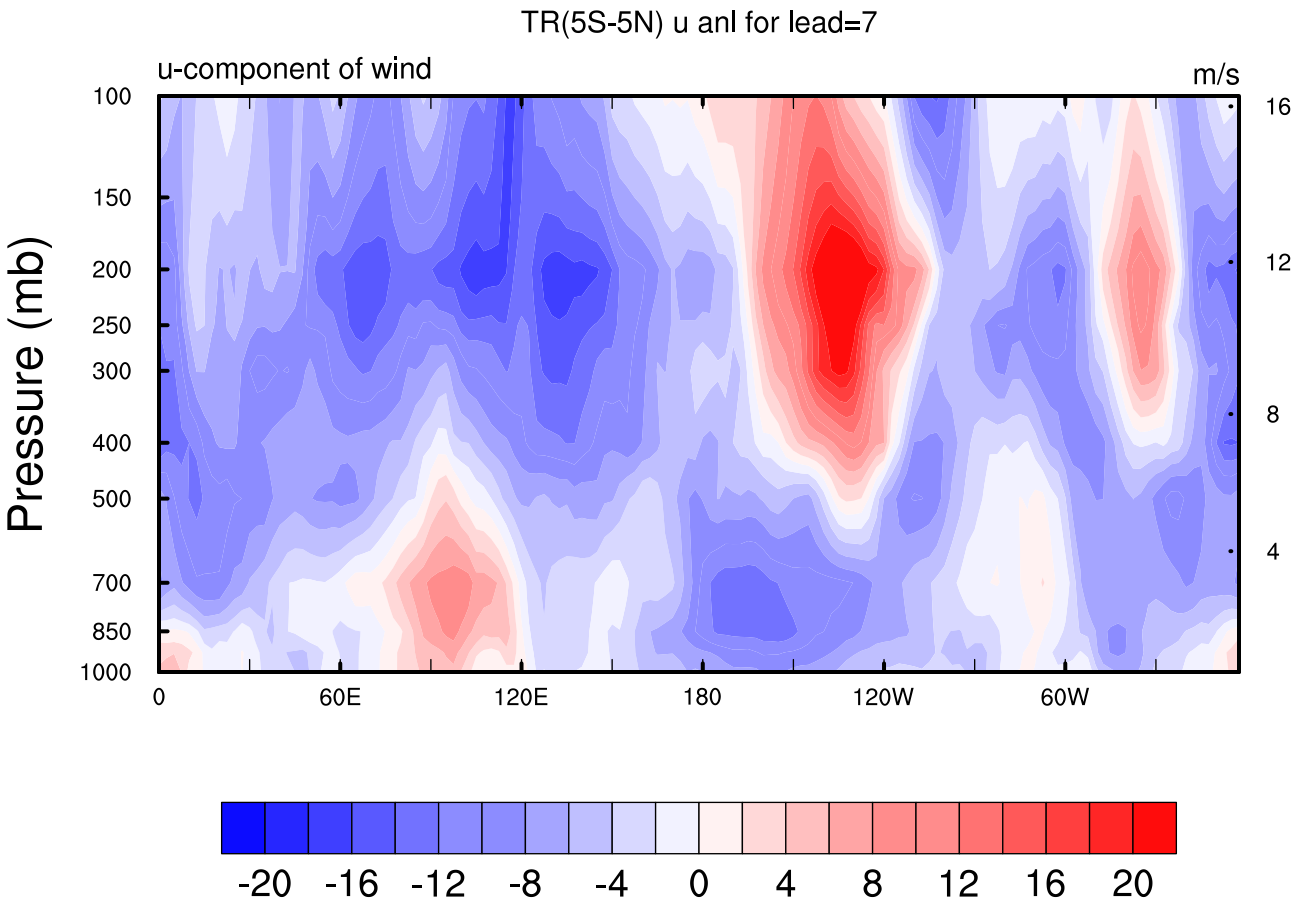

TR(5S-5N) vp anl for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

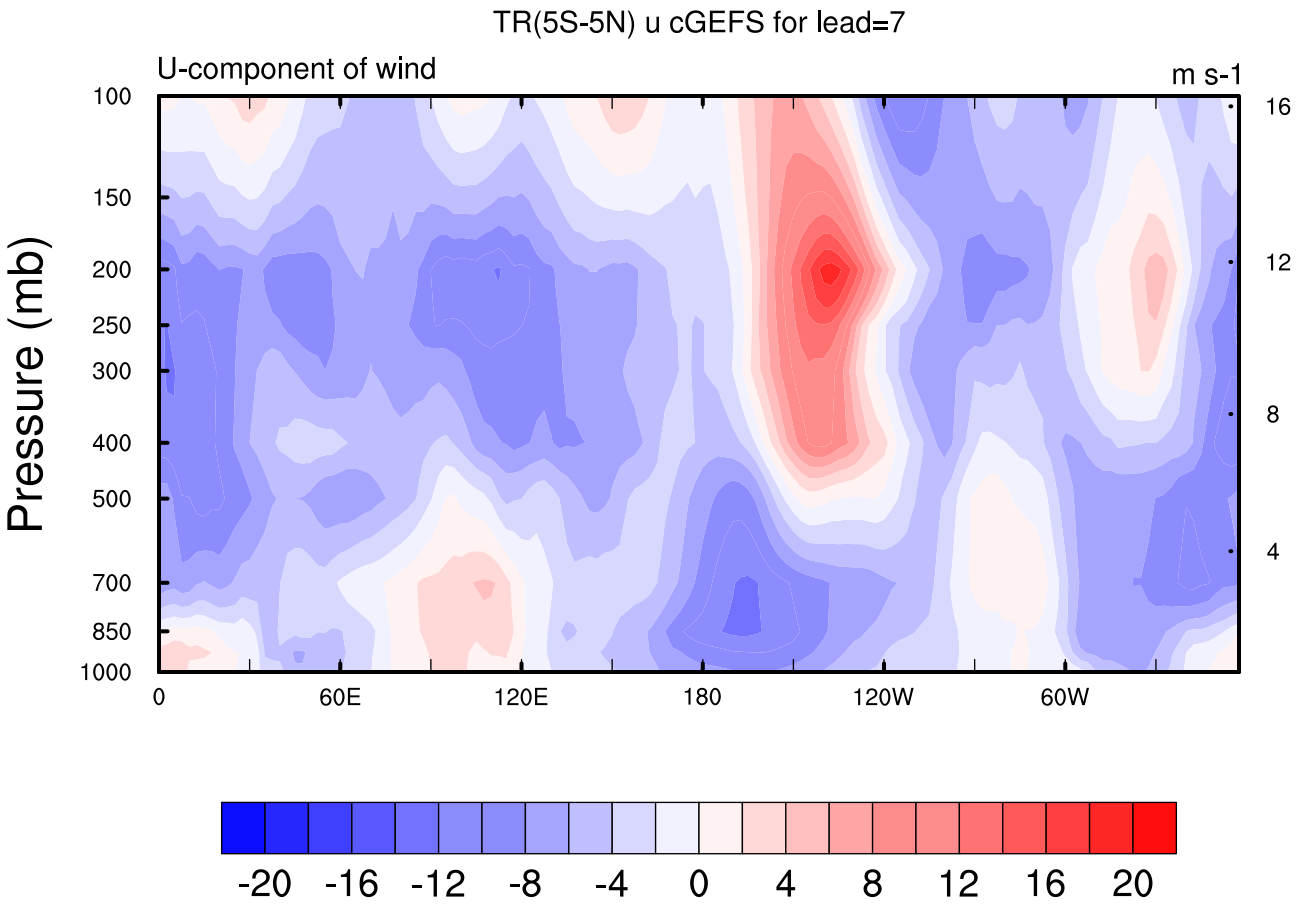

TR(5S-5N) vp cGEFS for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

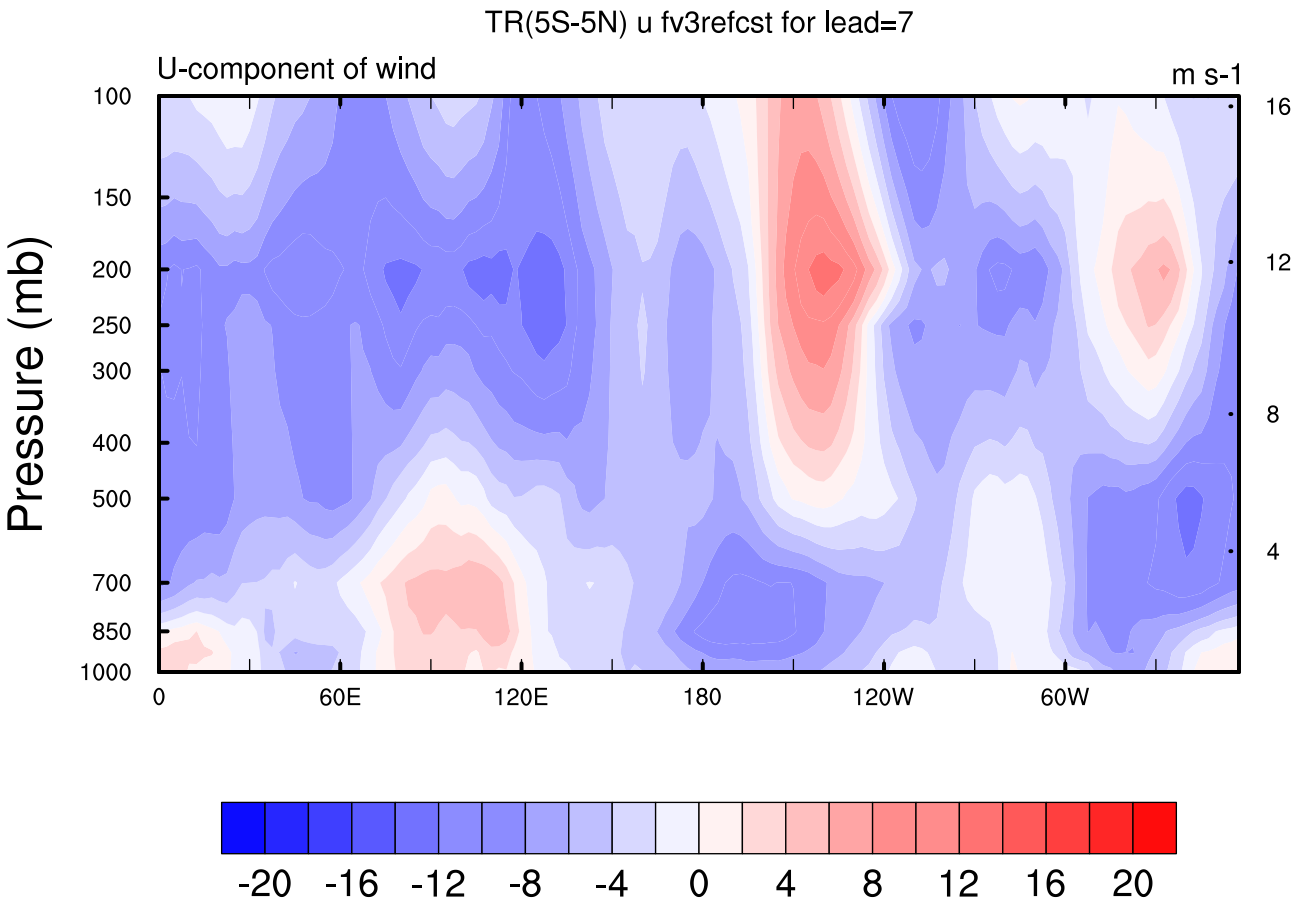

TR(5S-5N) vp fv3refcst for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

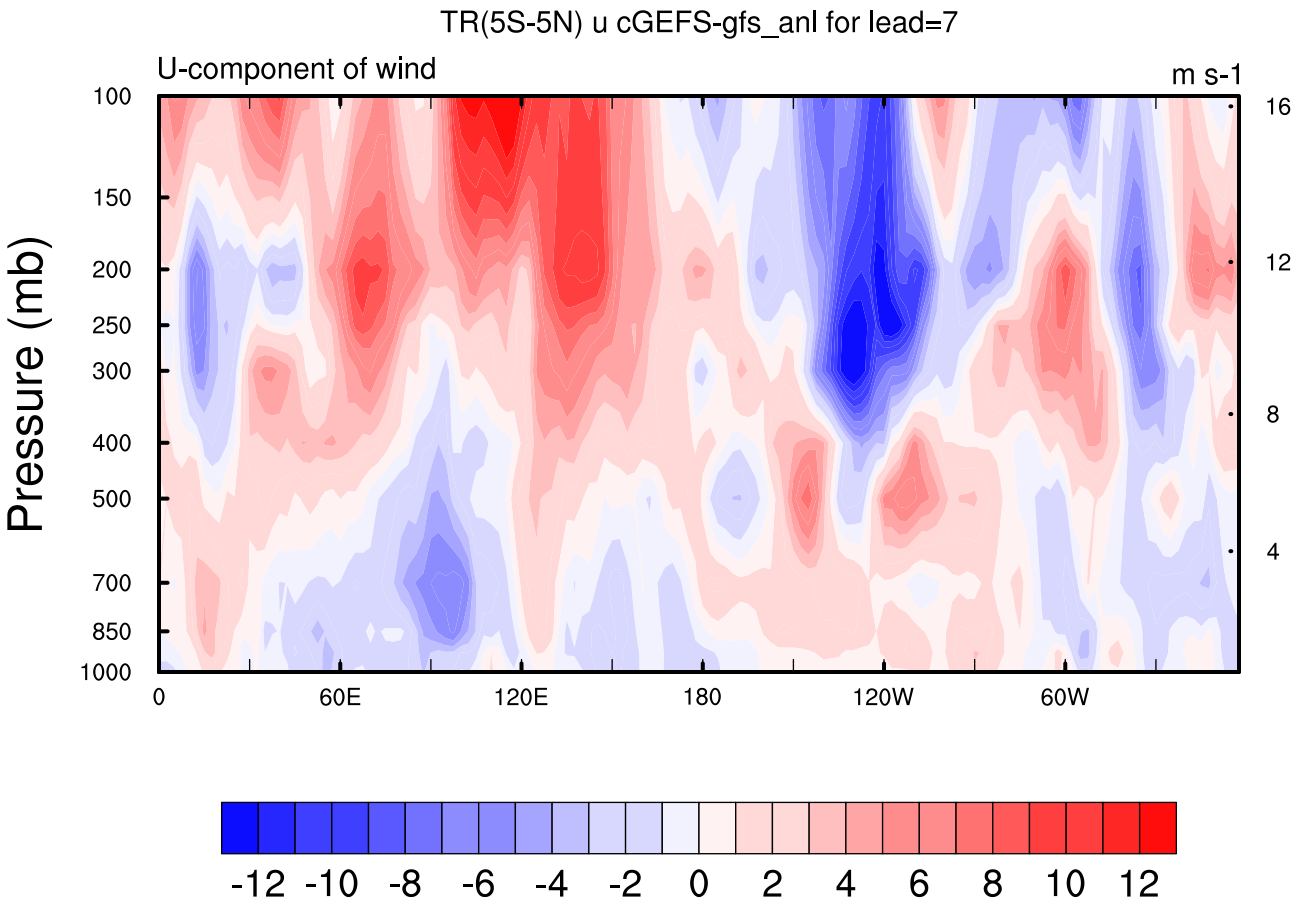

TR(5S-5N) vp cGEFS-gfs_anl for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

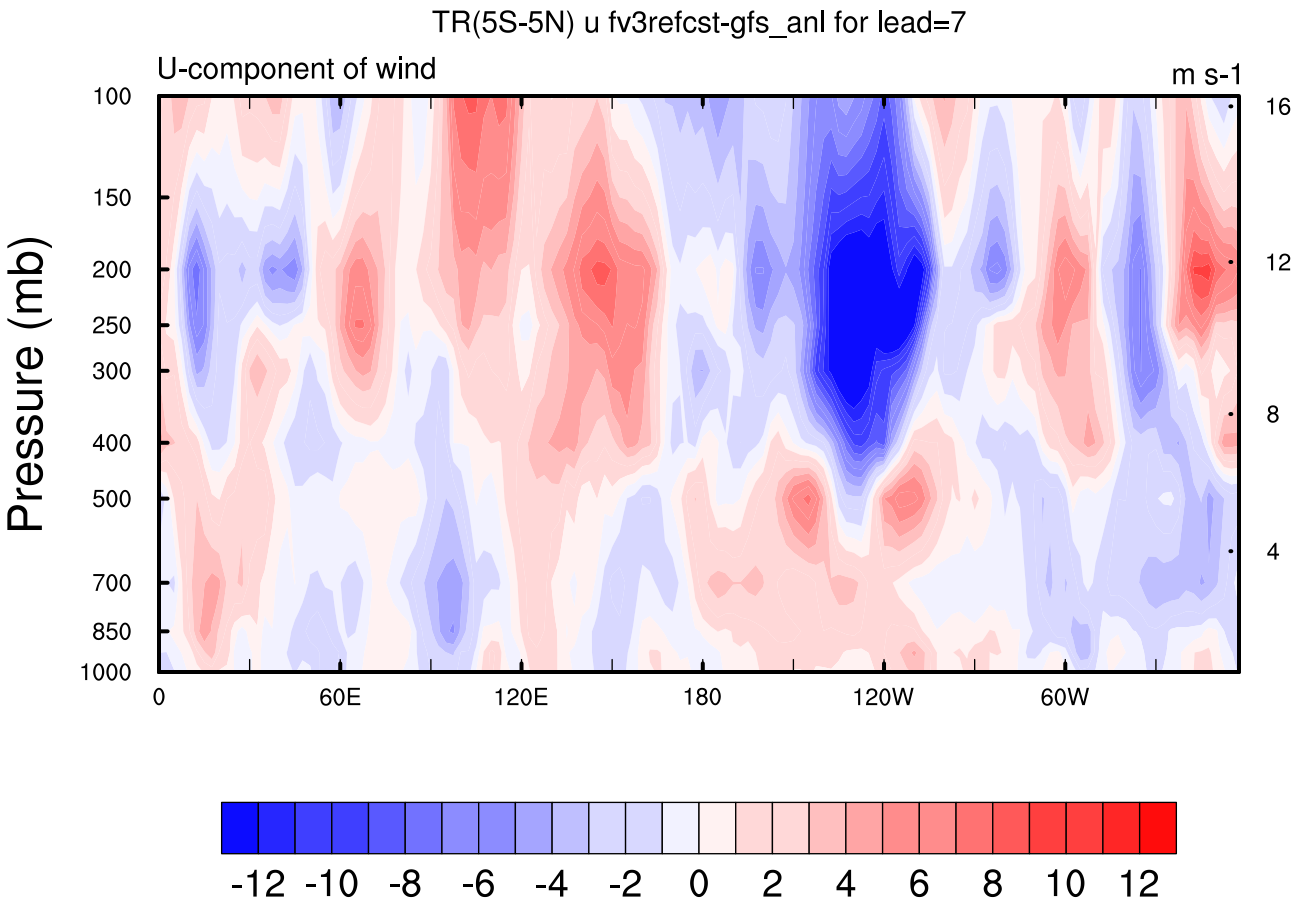

TR(5S-5N) vp fv3refcst-gfs_anl for lead=7
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

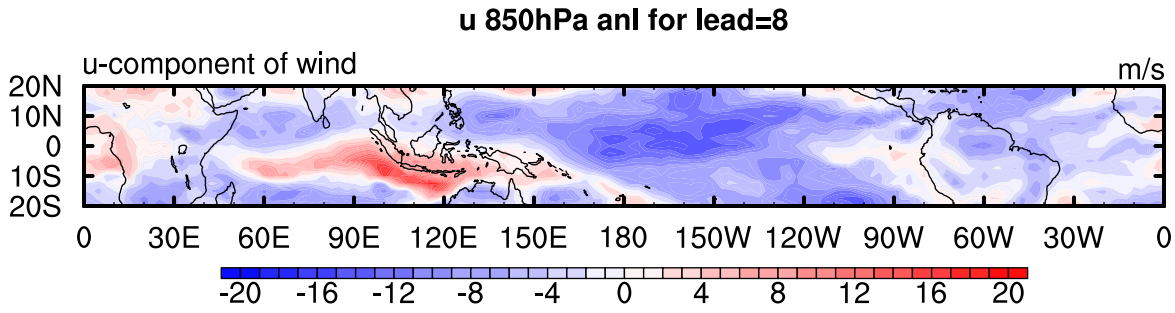

TR(5S-5N) u anl for lead=7
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

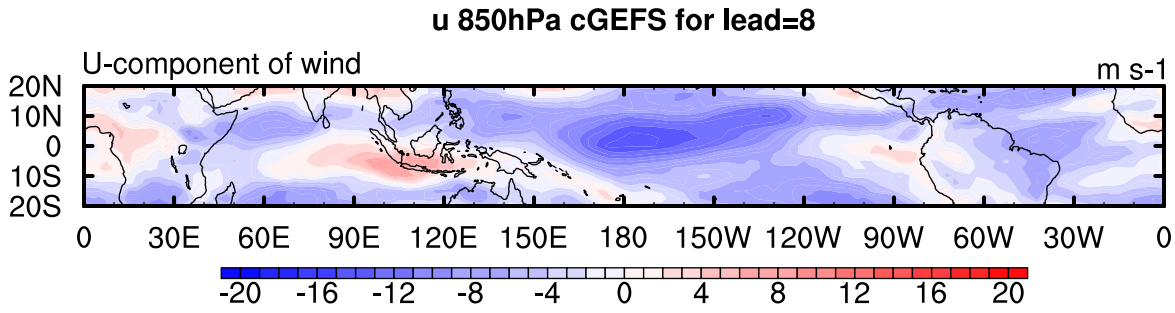

TR(5S-5N) u cGEFS for lead=7
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

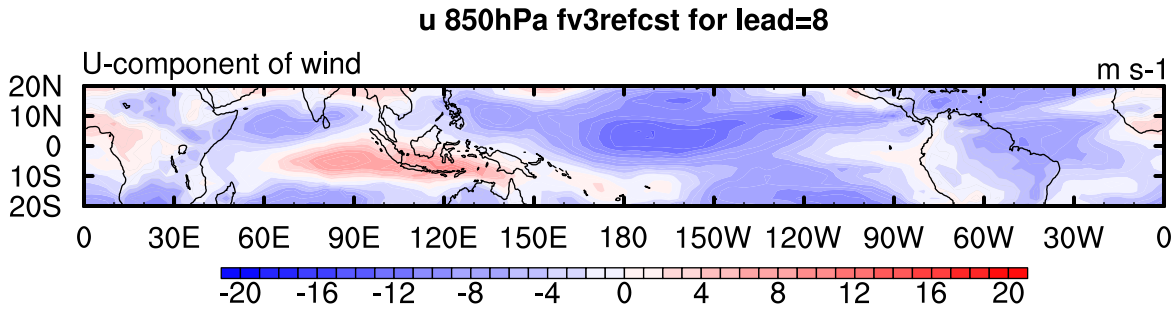

TR(5S-5N) u fv3refcst for lead=7
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

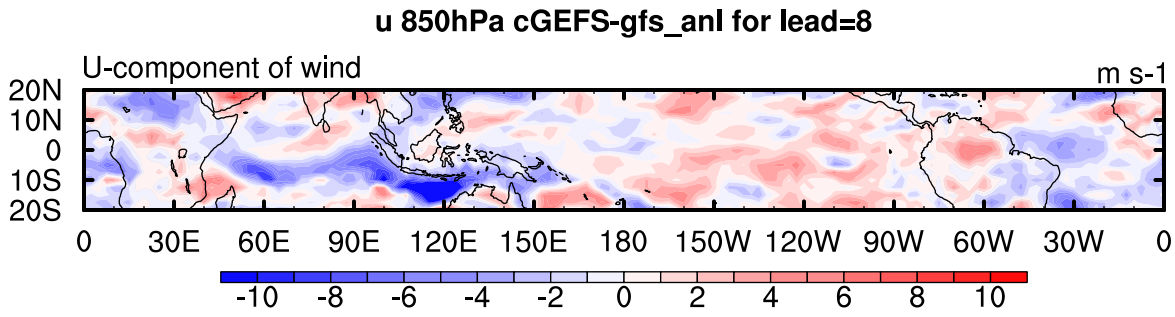

TR(5S-5N) u cGEFS-gfs_anl for lead=7
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

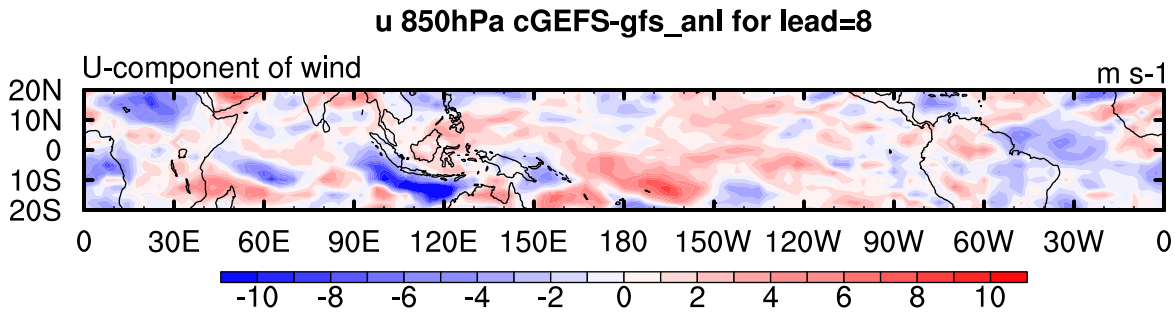

TR(5S-5N) u fv3refcst-gfs_anl for lead=7
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

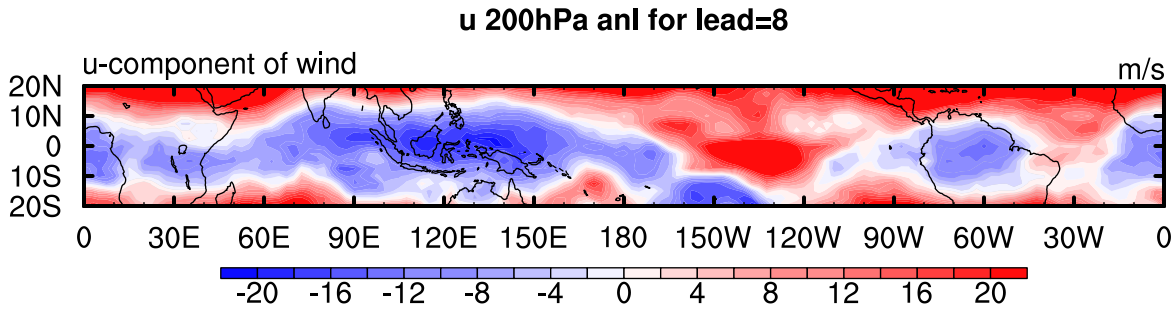

u 850hPa anl for lead=8
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

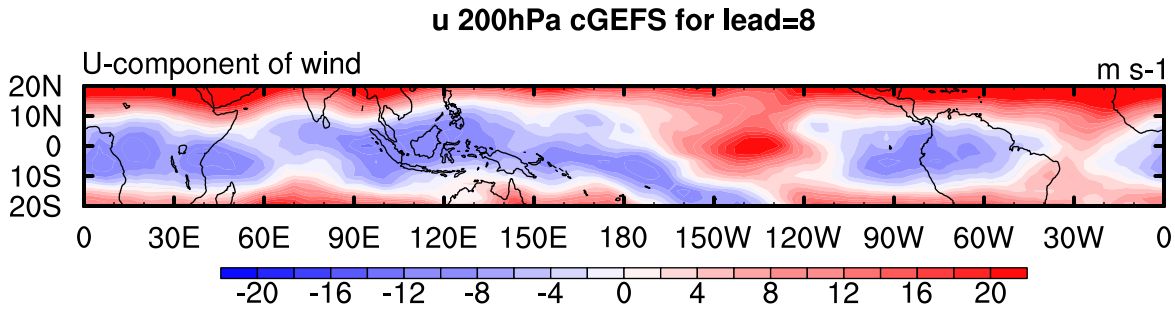

u 850hPa cGEFS for lead=8
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

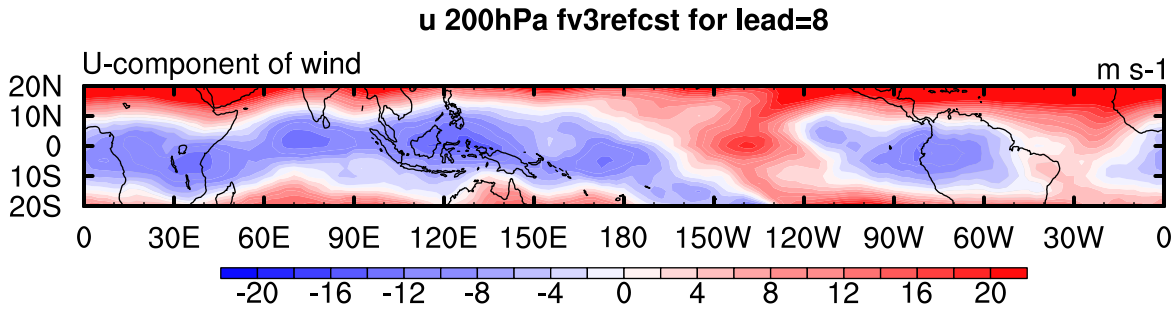

u 850hPa fv3refcst for lead=8
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

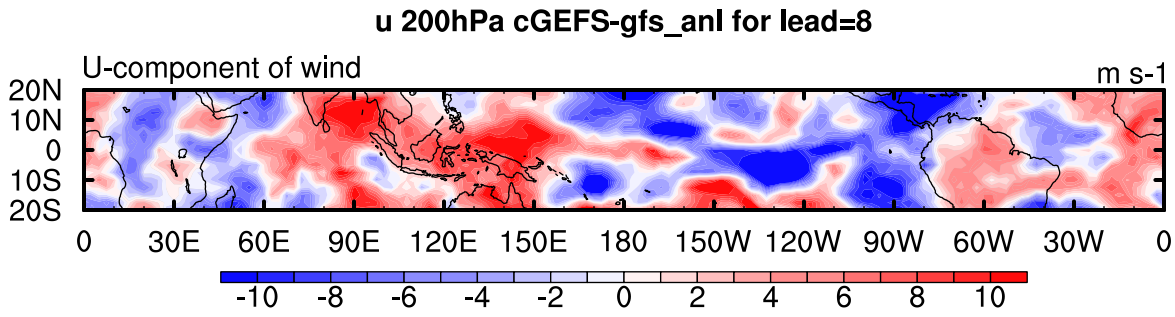

u 850hPa cGEFS-gfs_anl for lead=8
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

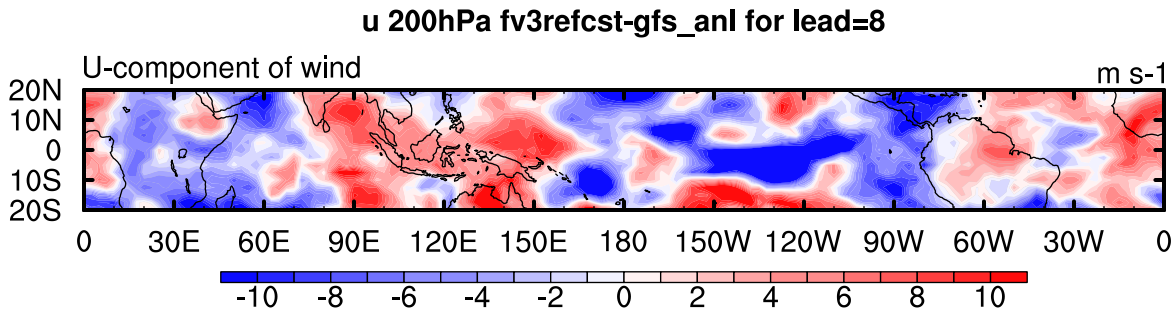

u 850hPa cGEFS-gfs_anl for lead=8
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

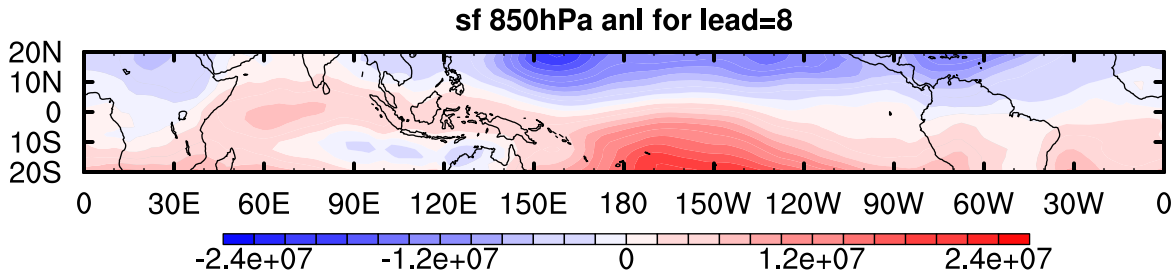

u 200hPa anl for lead=8
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

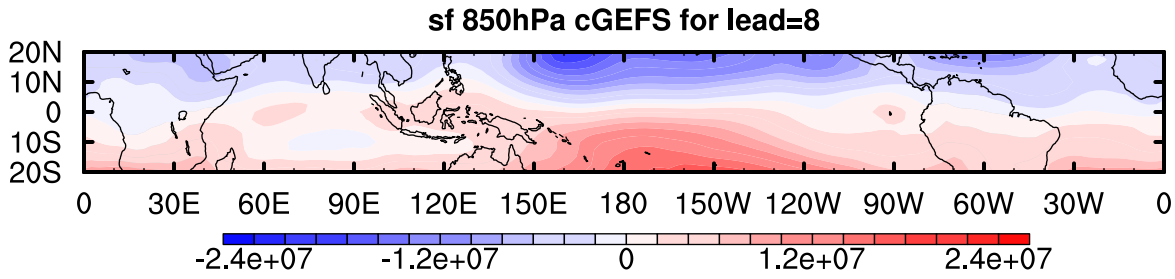

u 200hPa cGEFS for lead=8
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

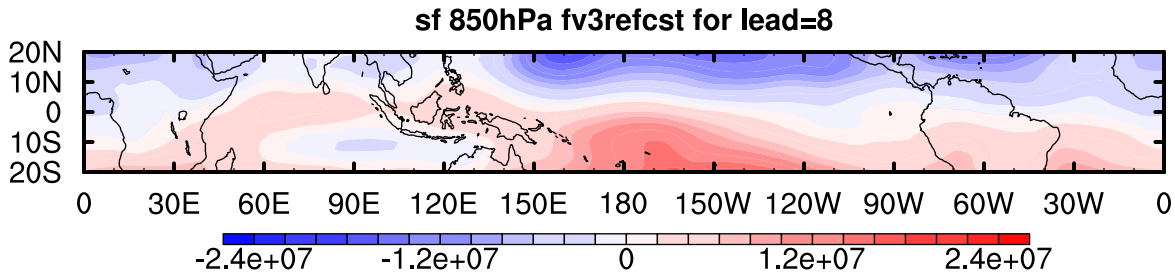

u 200hPa fv3refcst for lead=8
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

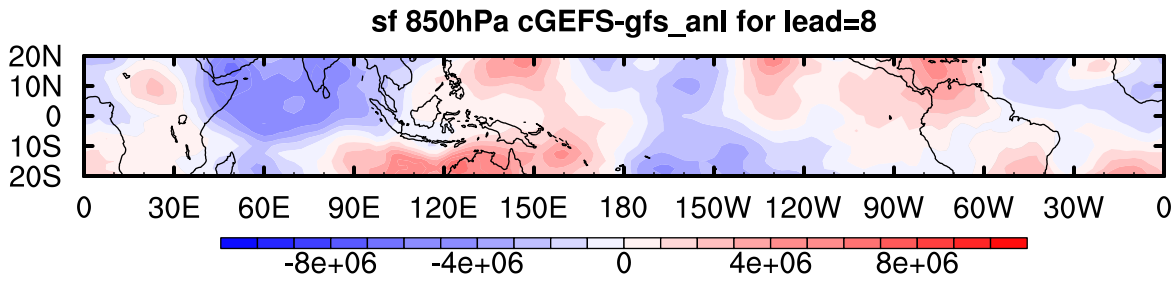

u 200hPa cGEFS-gfs_anl for lead=8
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=8
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


sf 850hPa anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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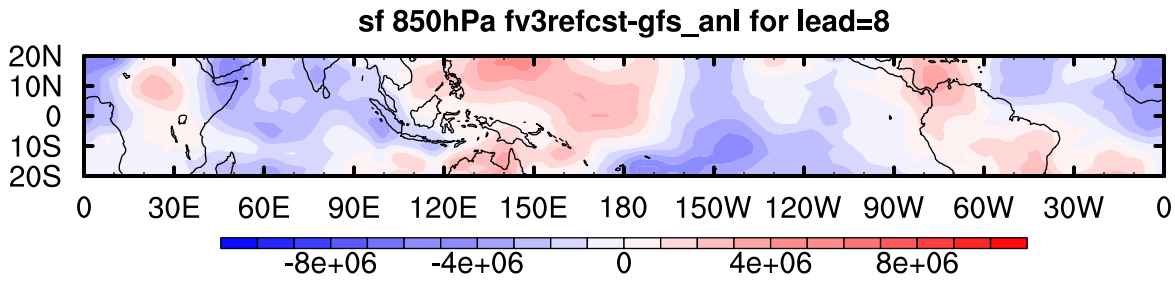
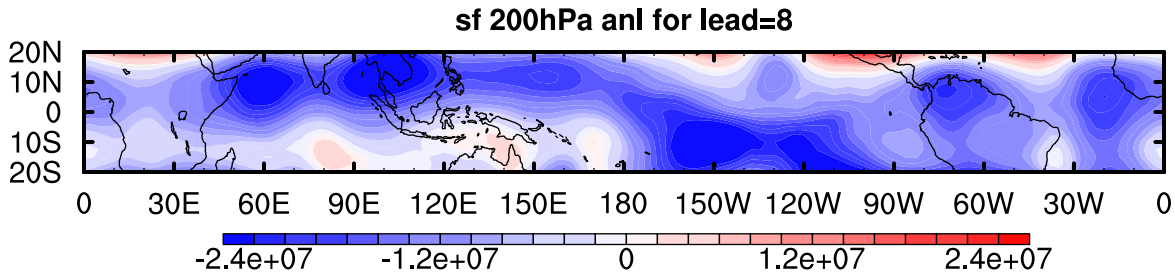
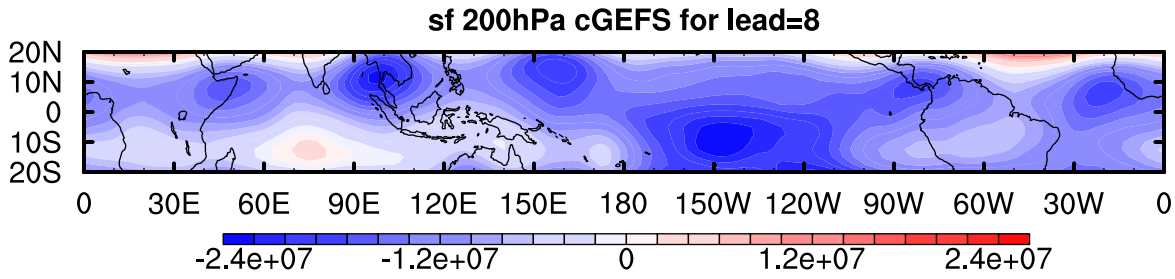
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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60W
30W
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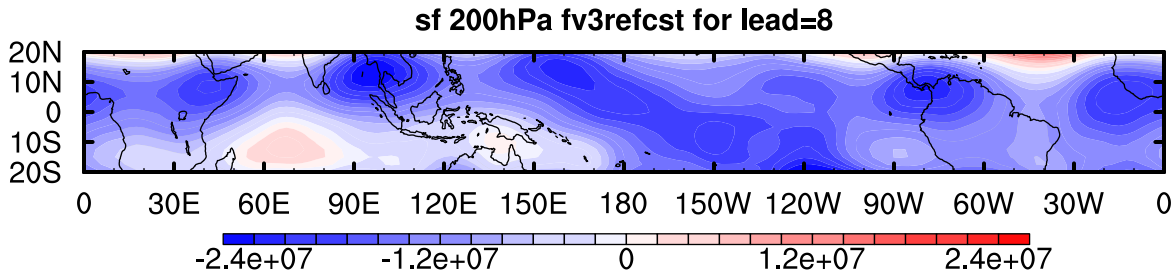
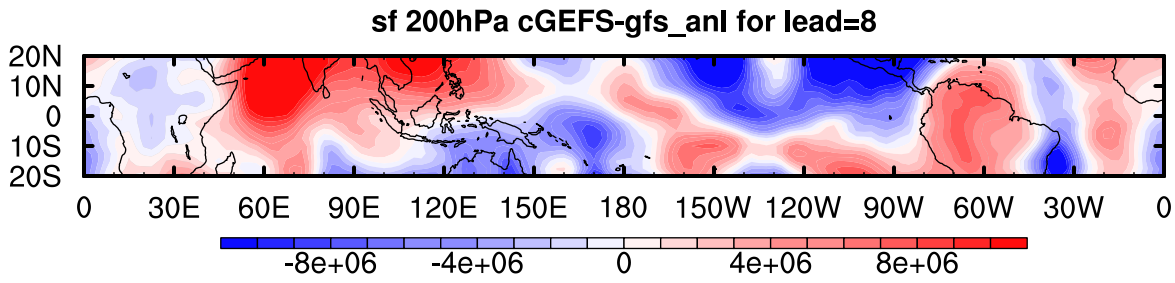
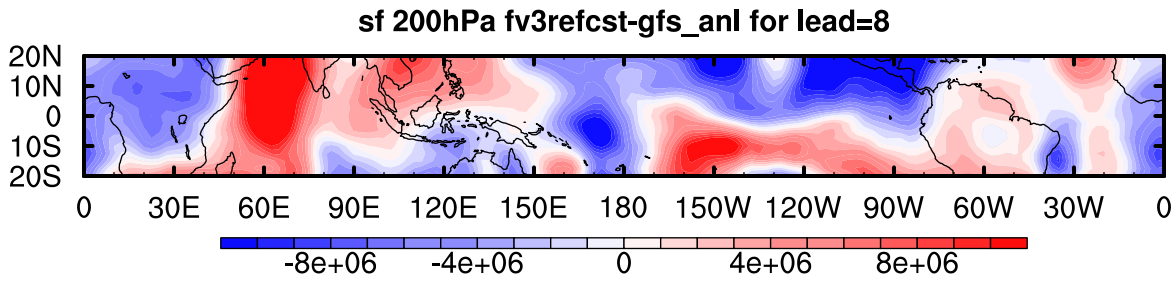
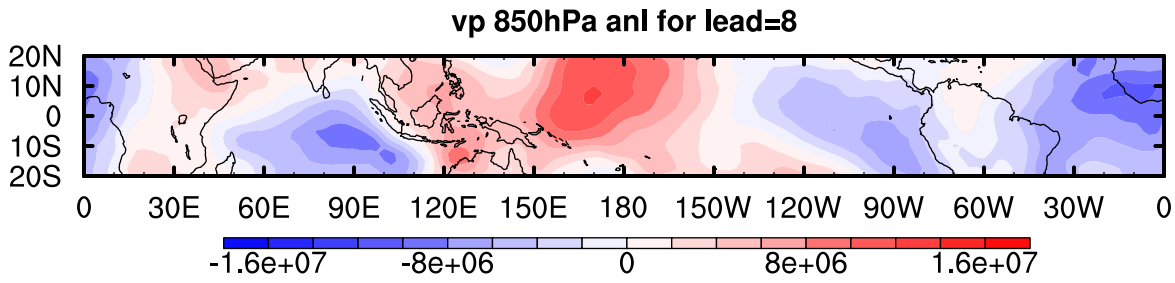
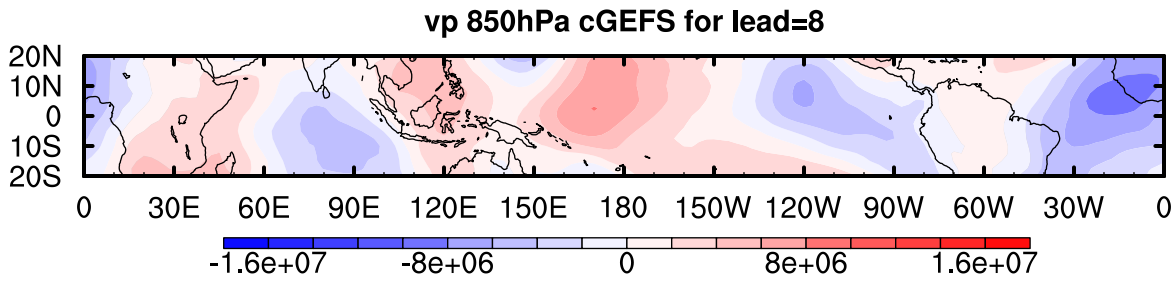
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

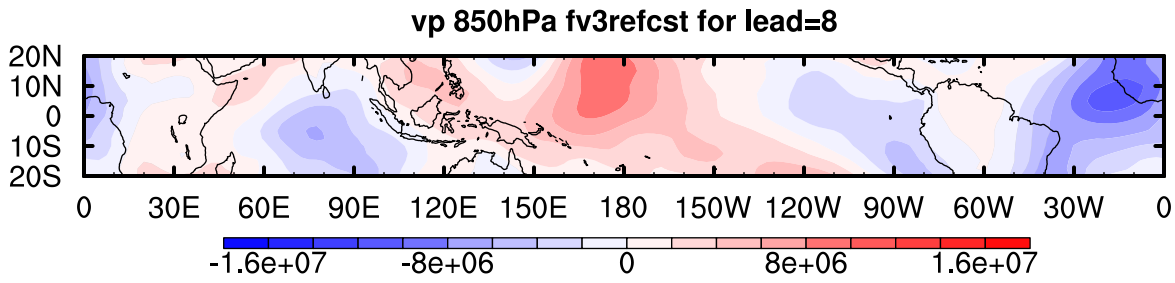

sf 200hPa fv3refcst for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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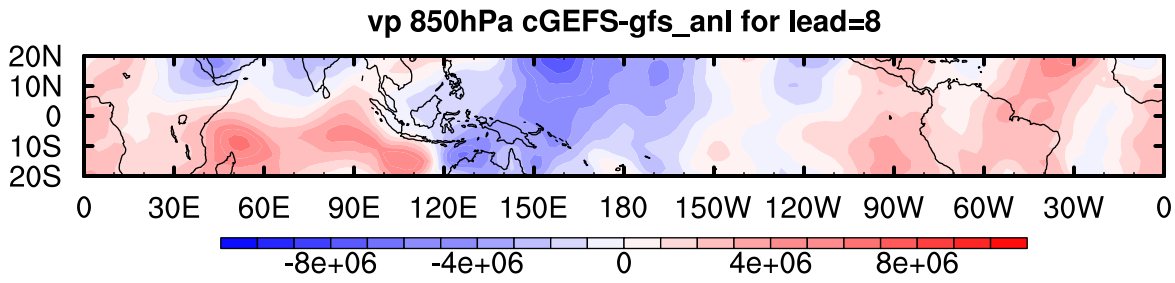
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
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180
150W
120W
90W
60W
30W
0
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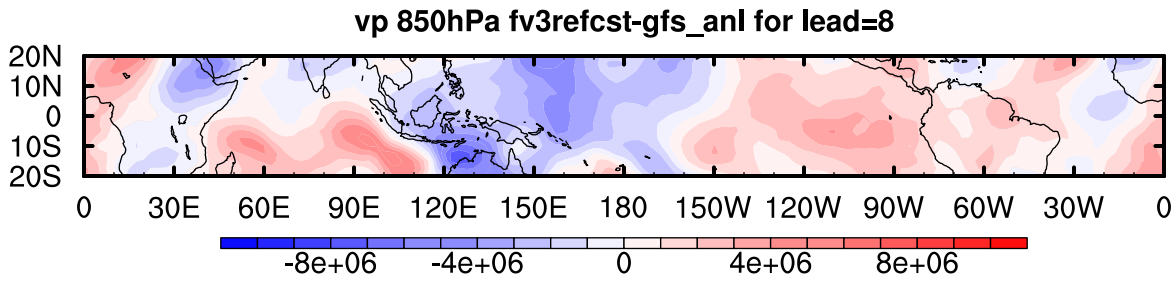
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
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150E
180
150W
120W
90W
60W
30W
0
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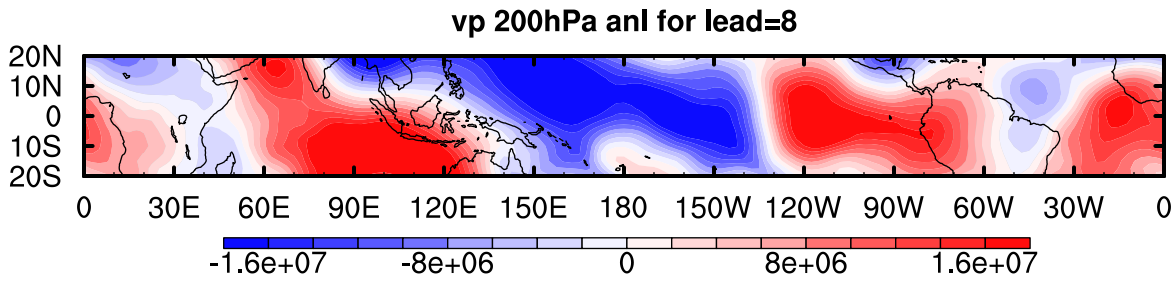
-4e+06
0
4e+06
8e+06


vp 200hPa anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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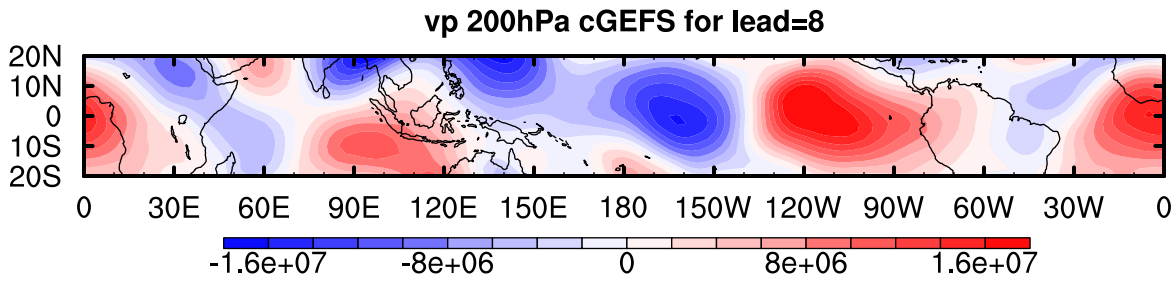
1.6e+07


vp 200hPa cGEFS for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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150W
120W
90W
60W
30W
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-8e+06
0
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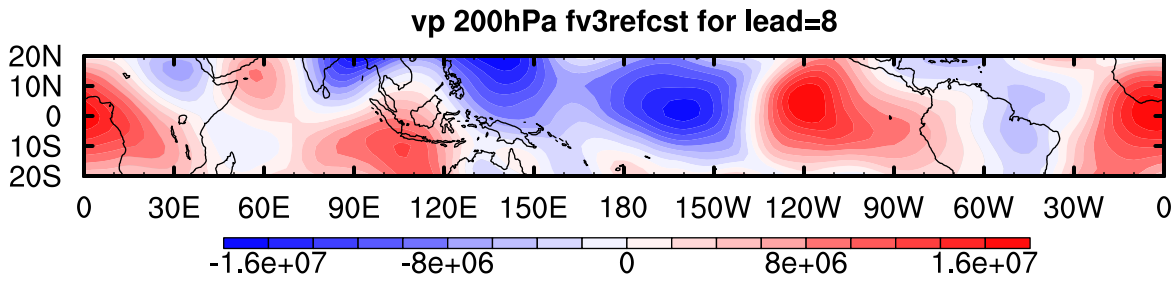
vp 200hPa fv3refcst for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
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90W
60W
30W
0
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-8e+06
0
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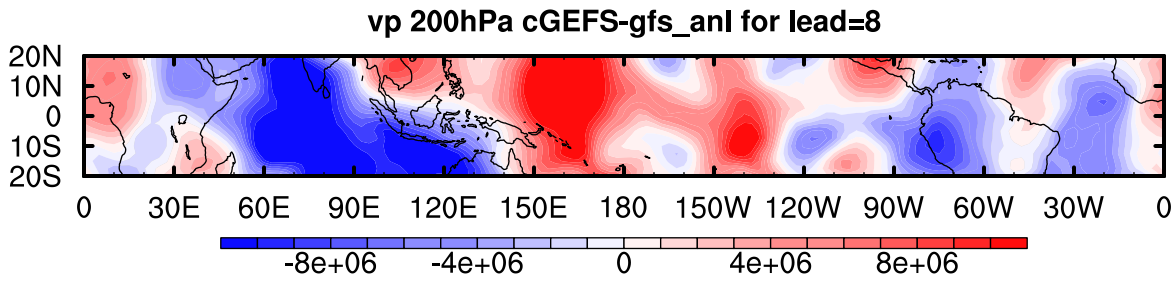
1.6e+07


vp 200hPa cGEFS-gfs_anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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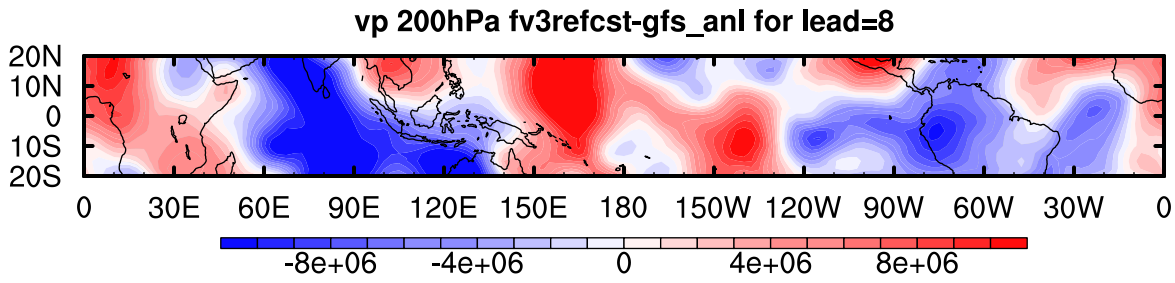
-4e+06
0
4e+06
8e+06


vp 200hPa fv3refcst-gfs_anl for lead=8
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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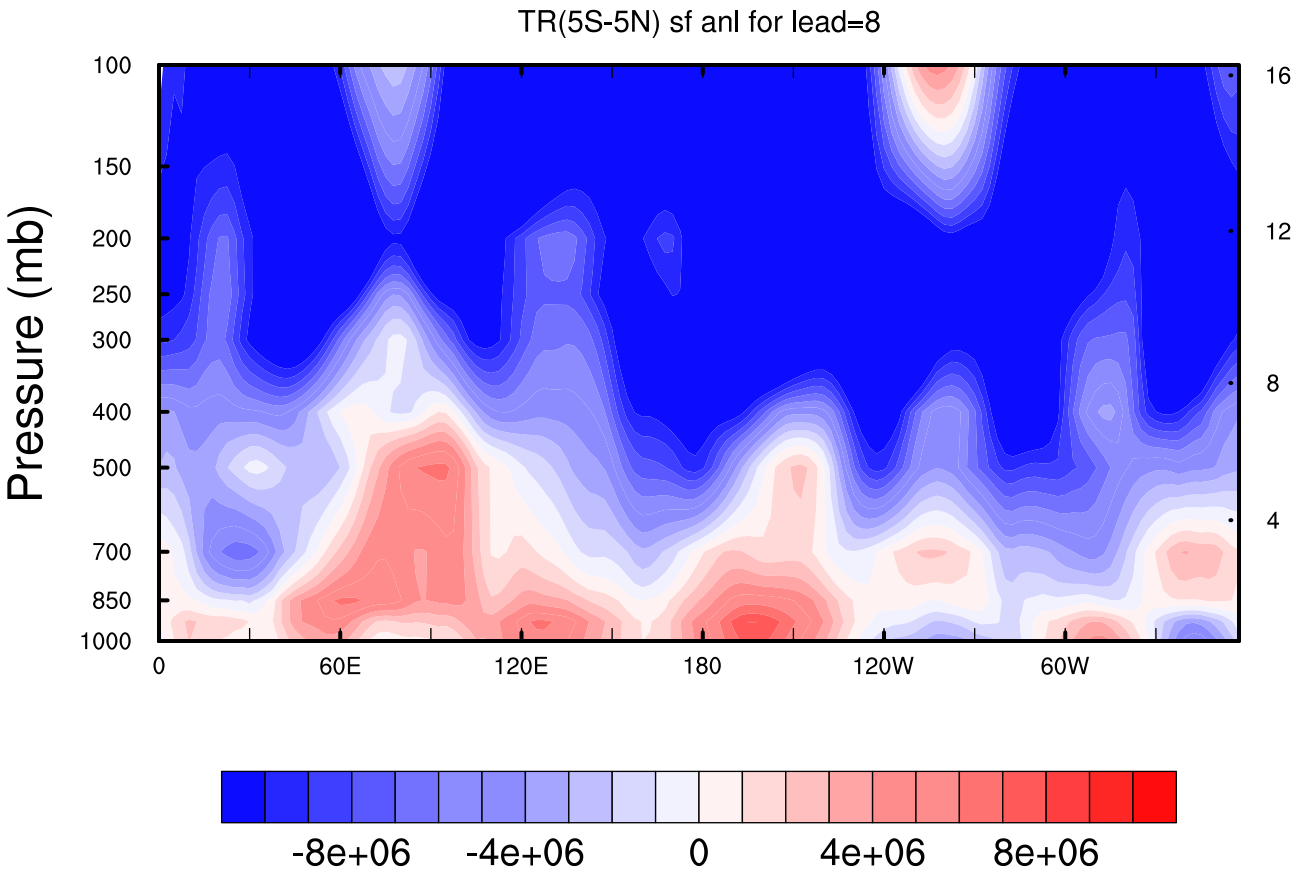
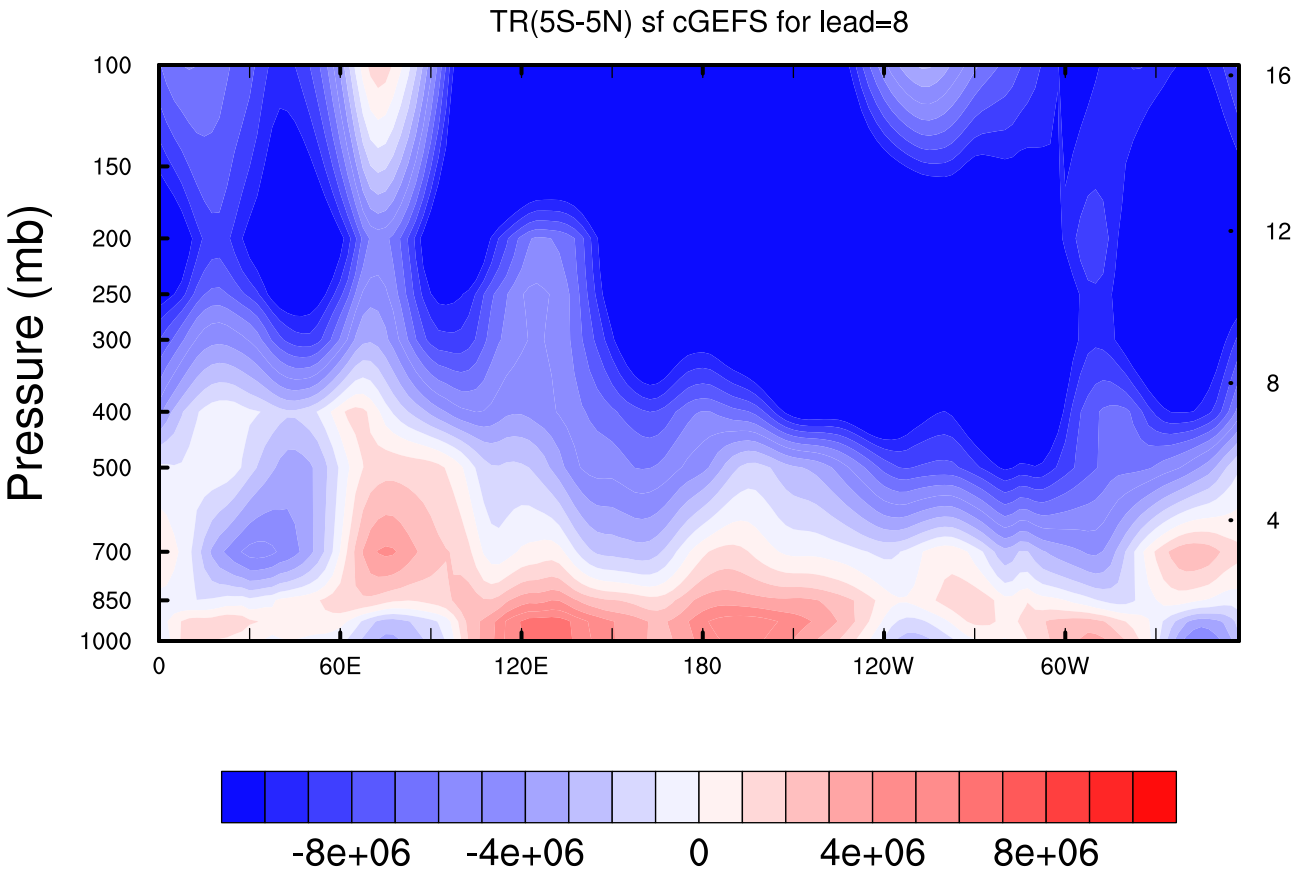
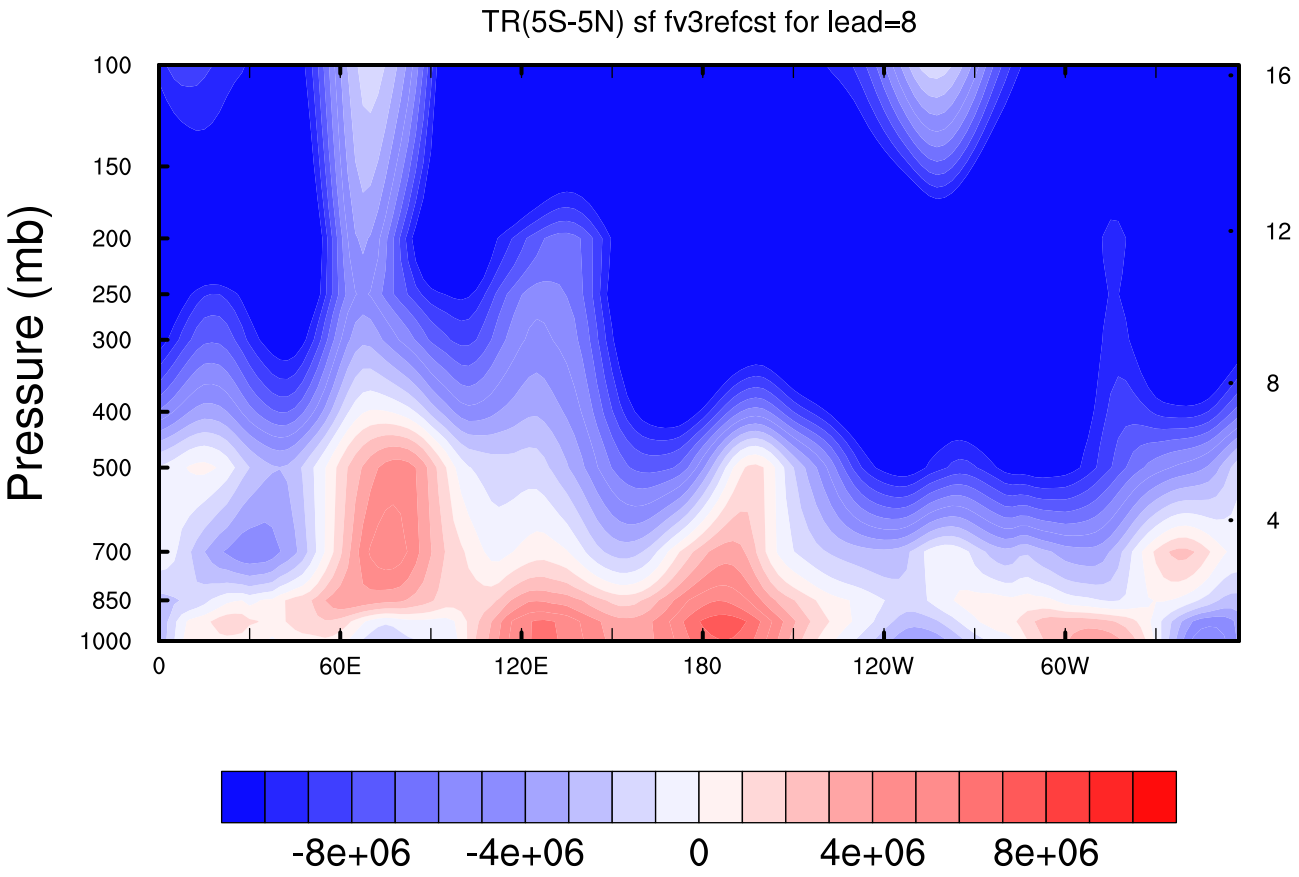
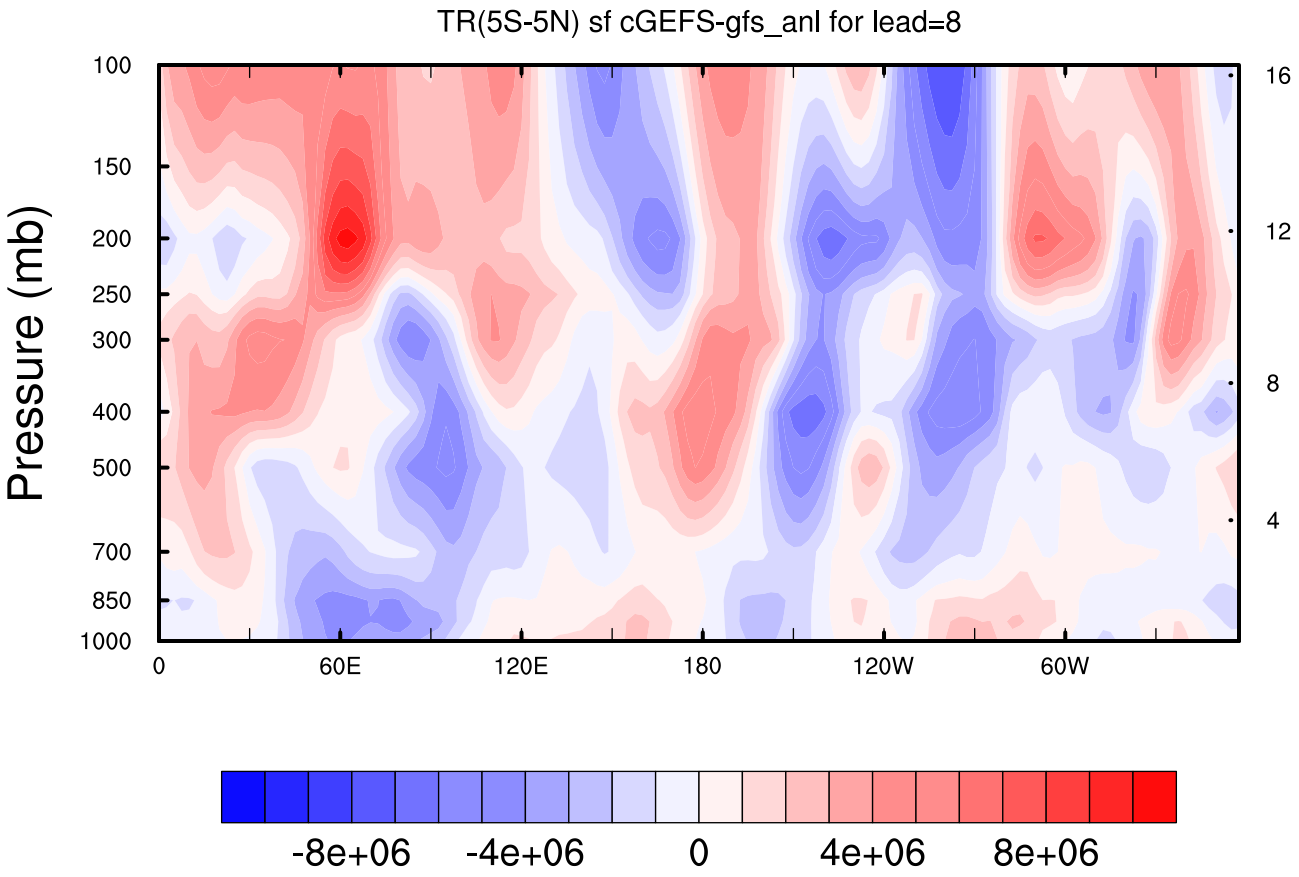
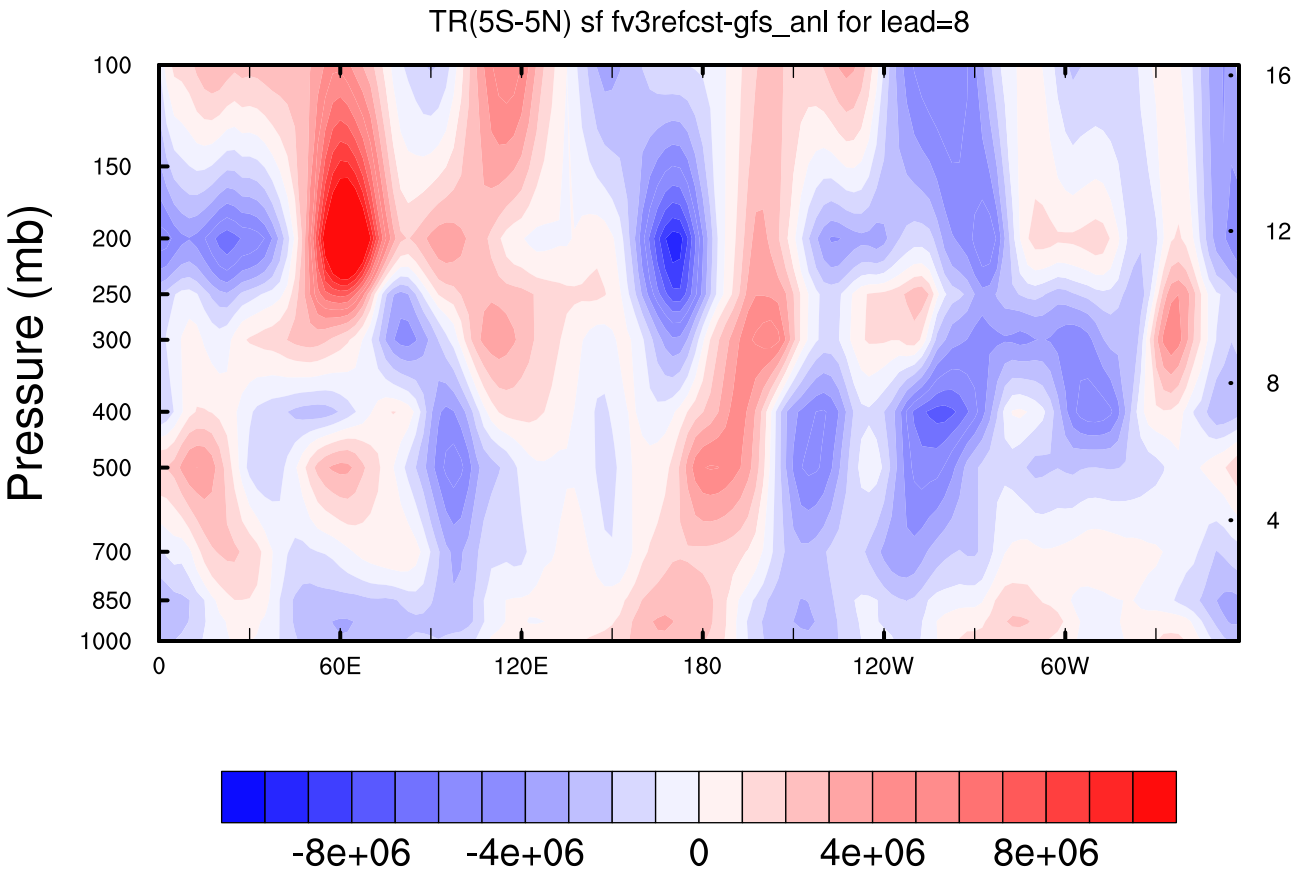
-4e+06
0
4e+06
8e+06

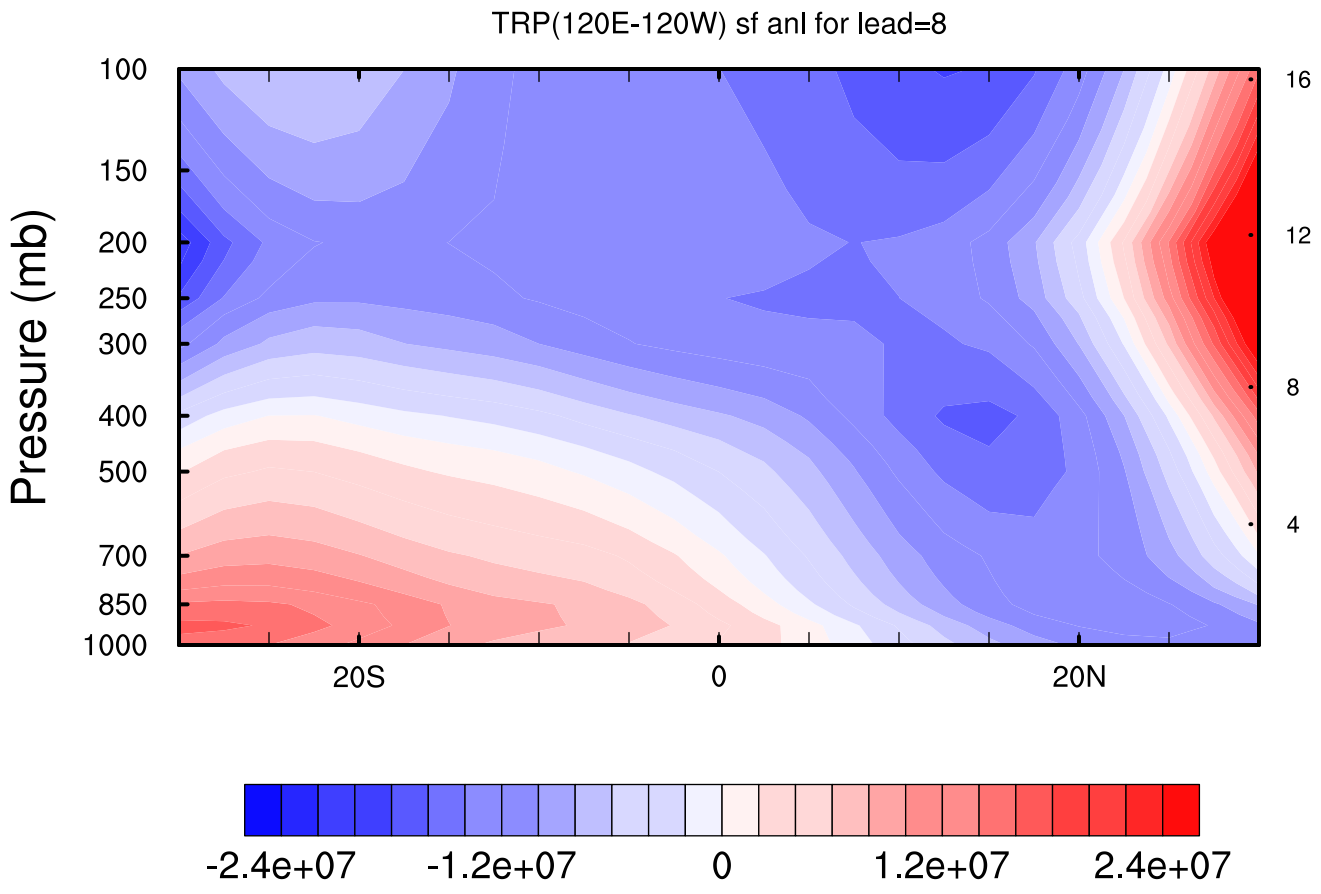

TR(5S-5N) sf anl for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

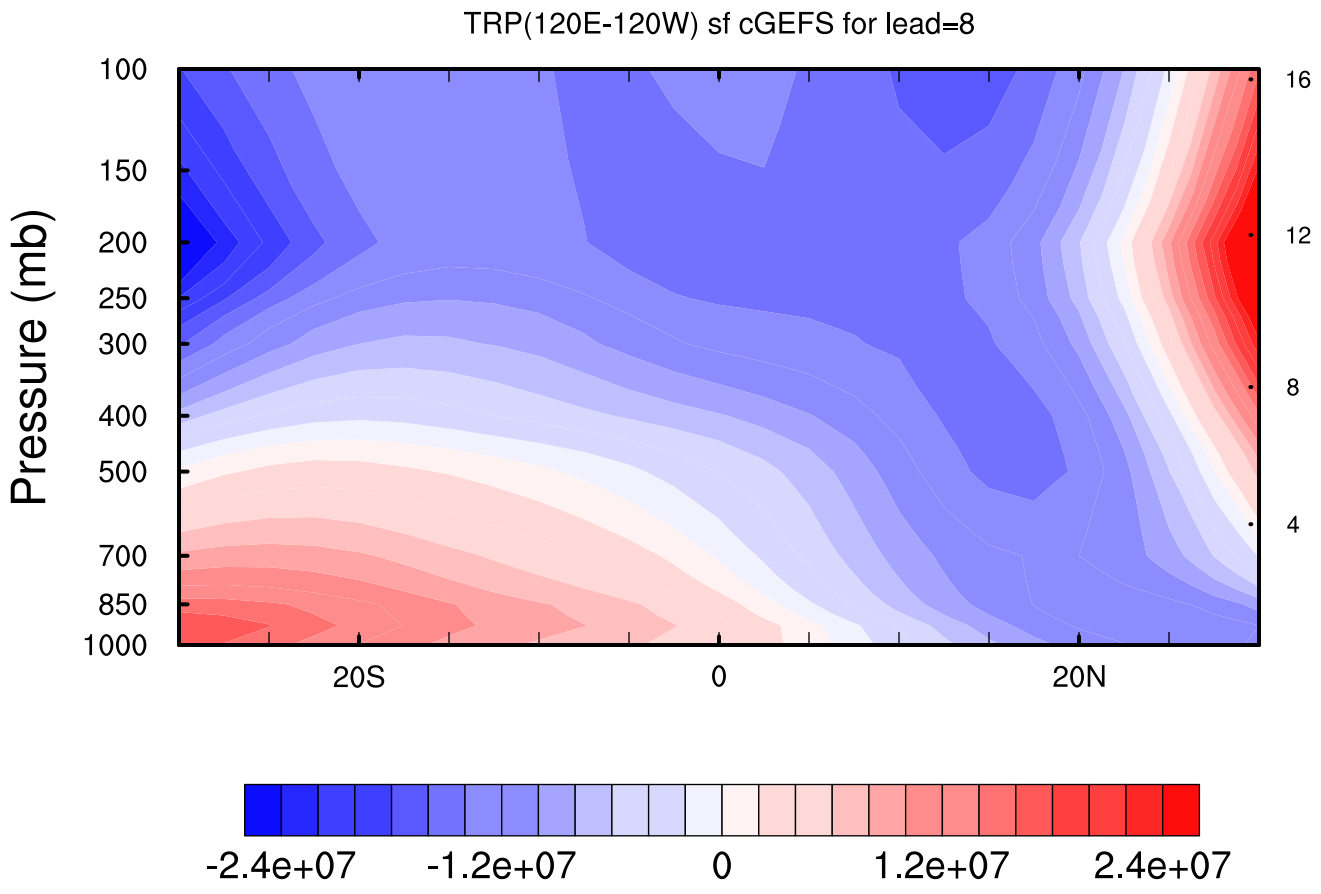

TR(5S-5N) sf cGEFS for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

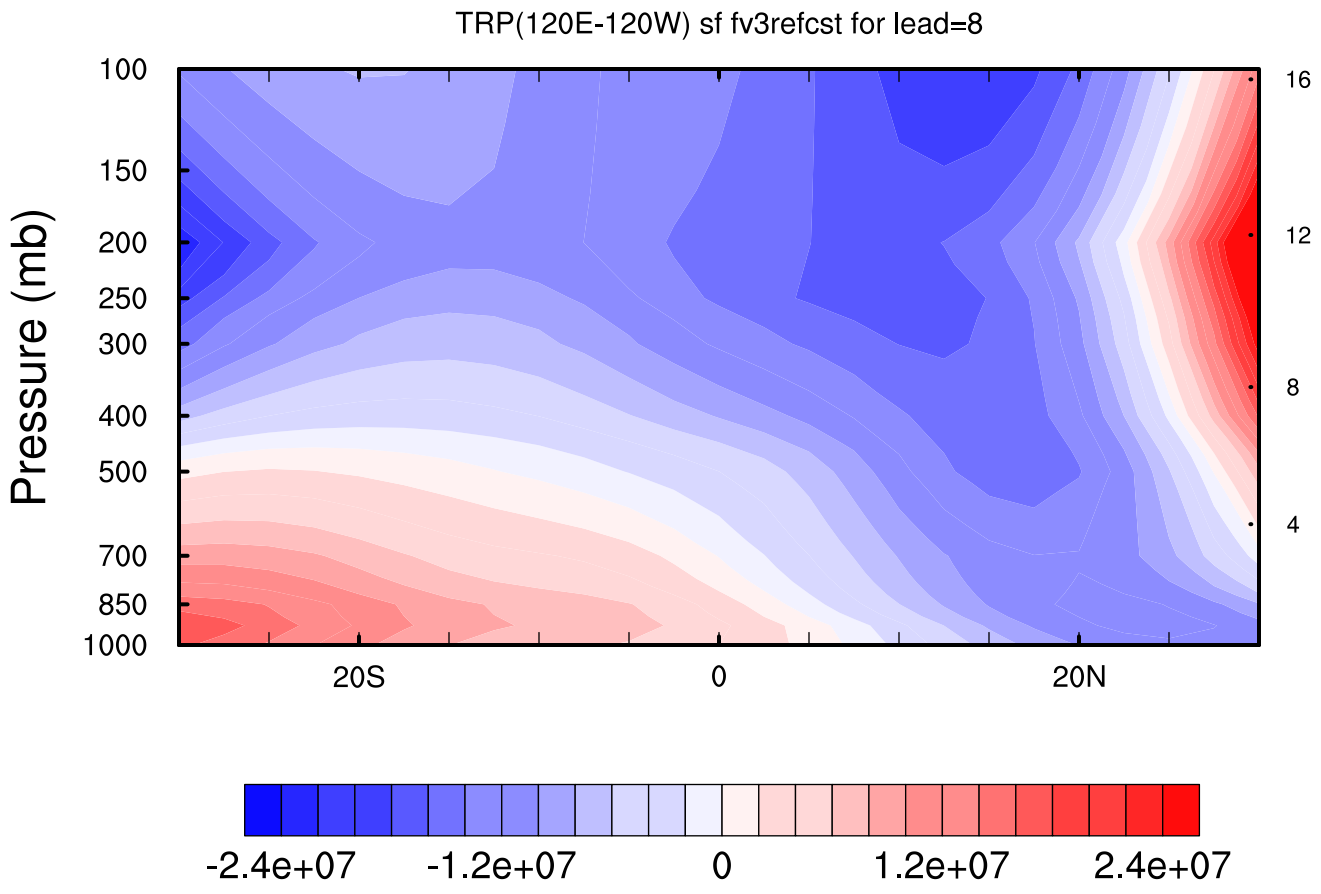

TR(5S-5N) sf fv3refcst for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

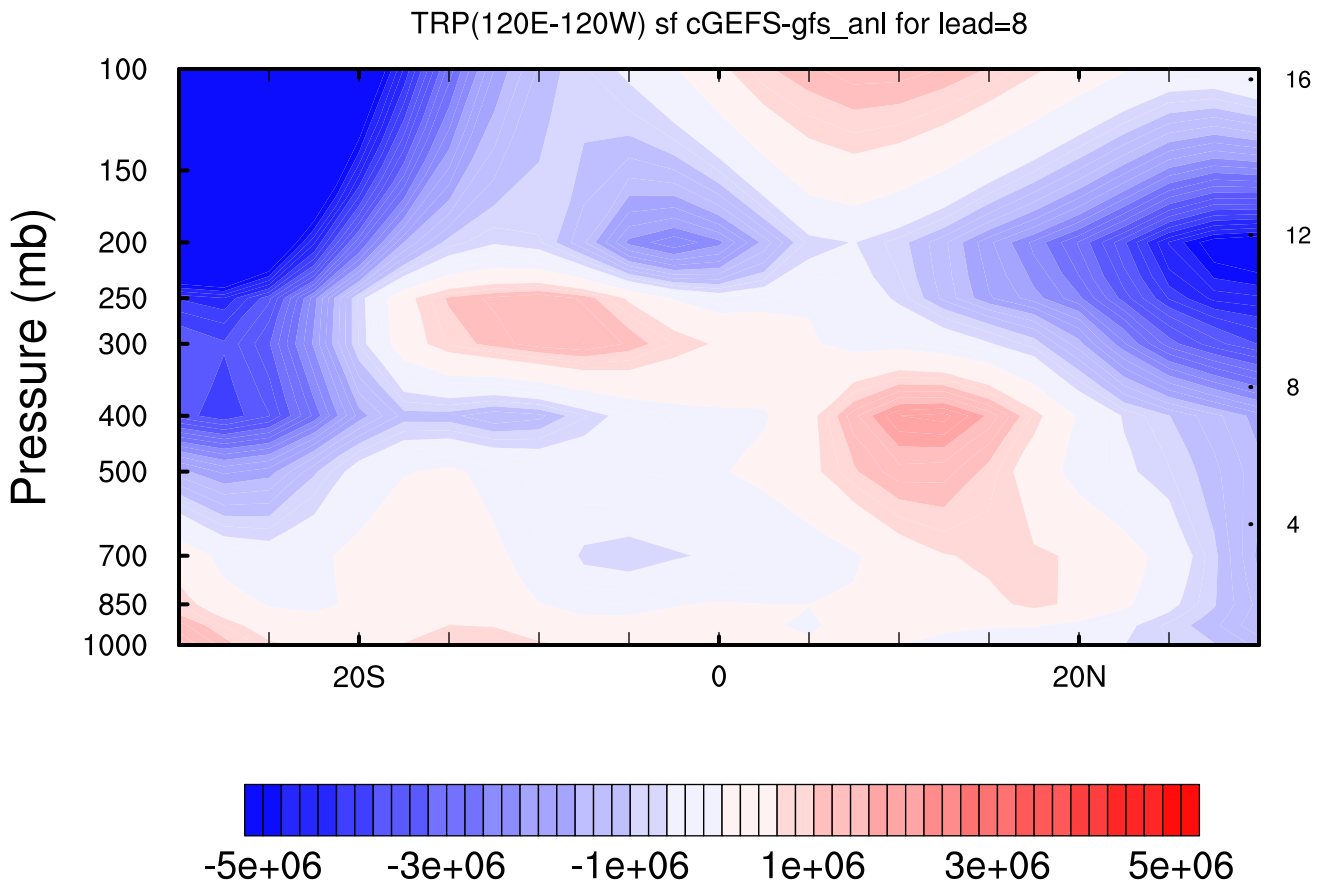

TR(5S-5N) sf cGEFS-gfs_anl for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

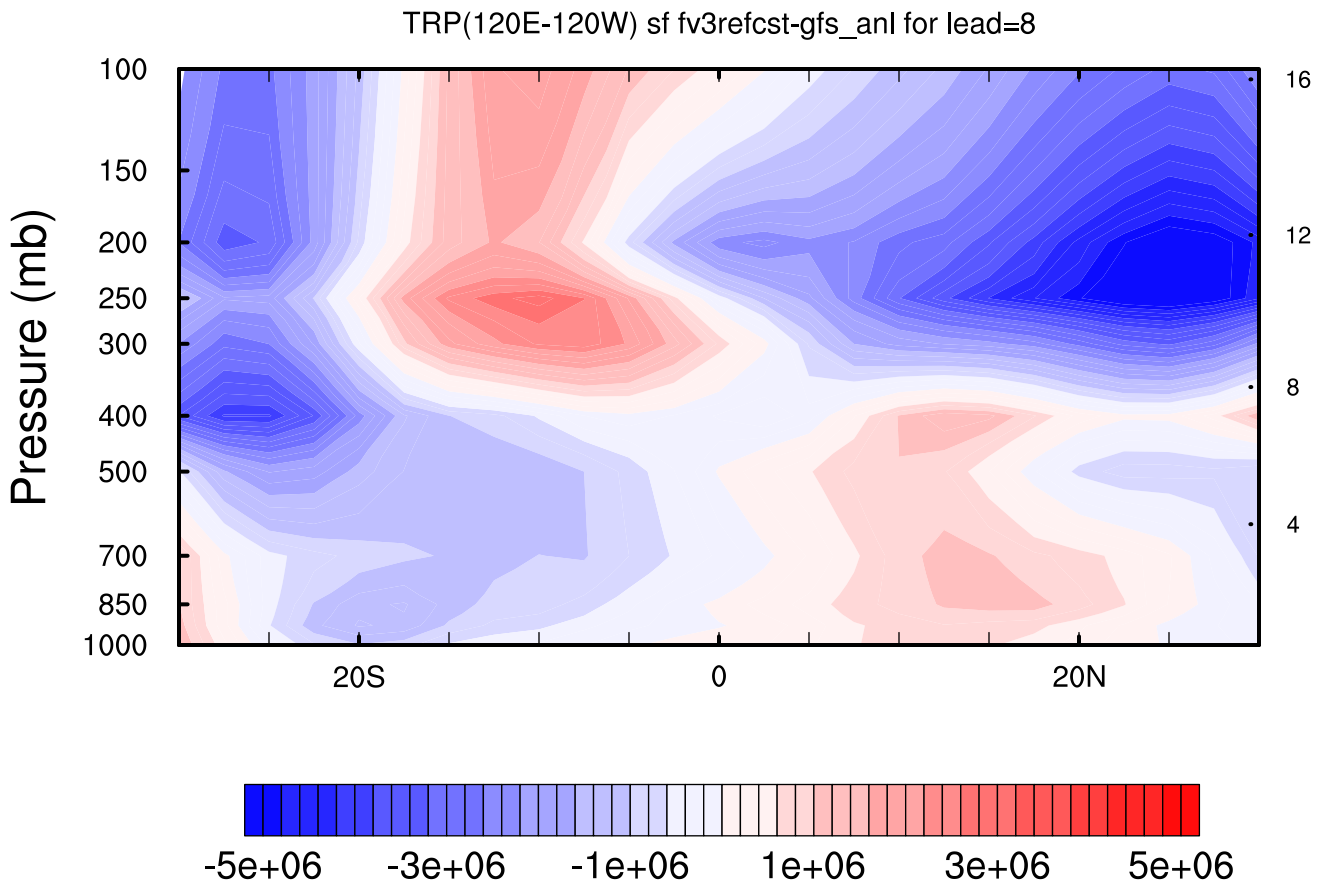

TR(5S-5N) sf fv3refcst-gfs_anl for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

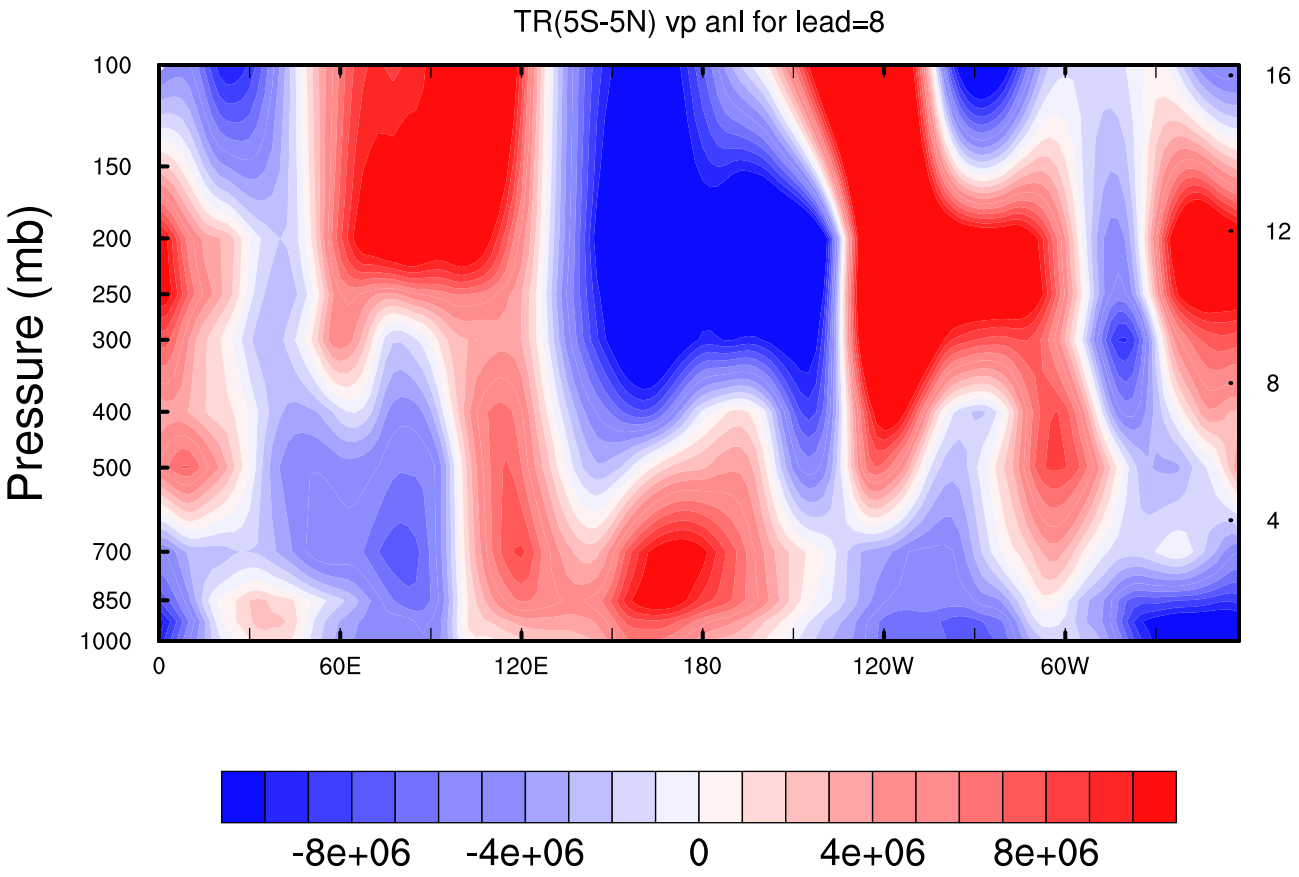

TRP(120E-120W) sf anl for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

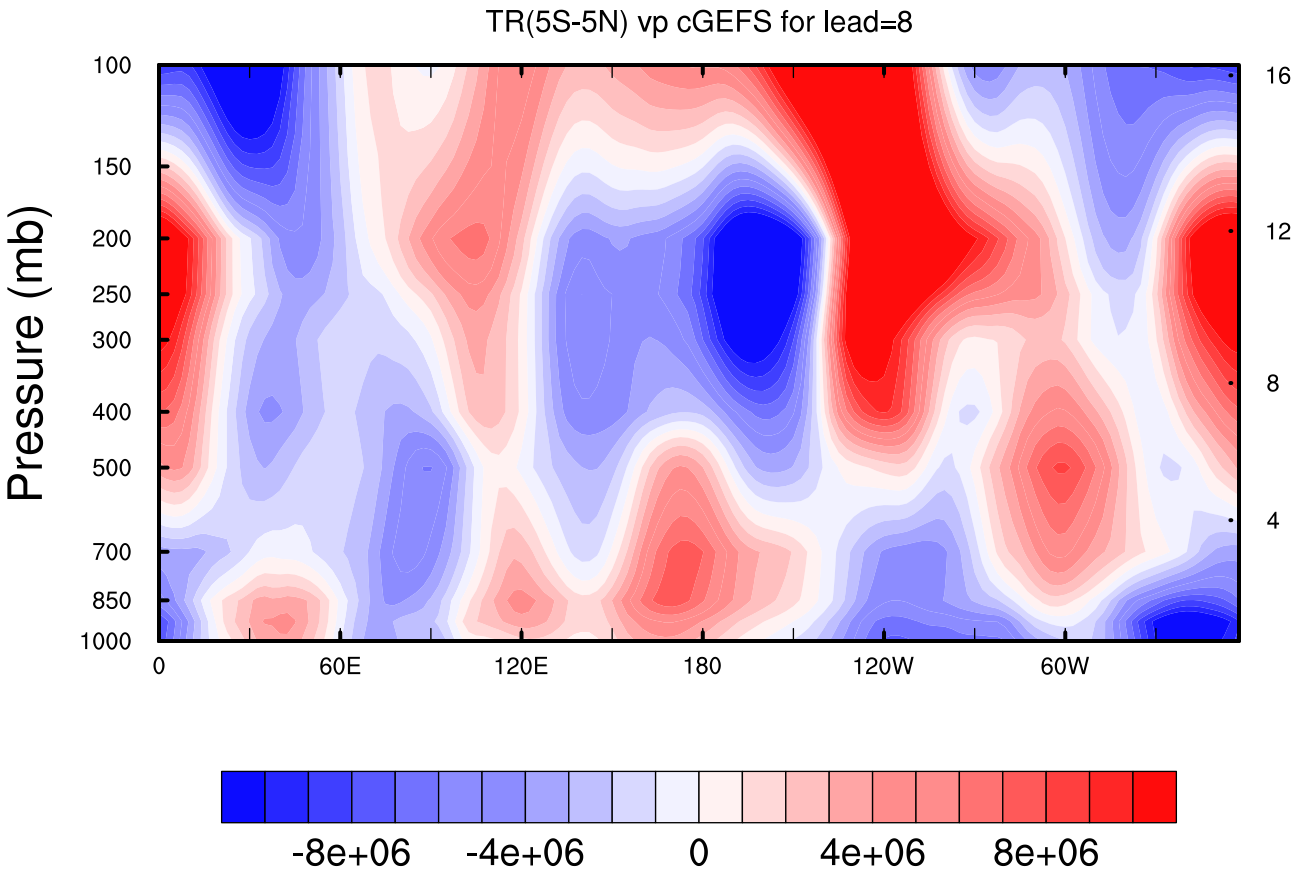

TRP(120E-120W) sf cGEFS for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

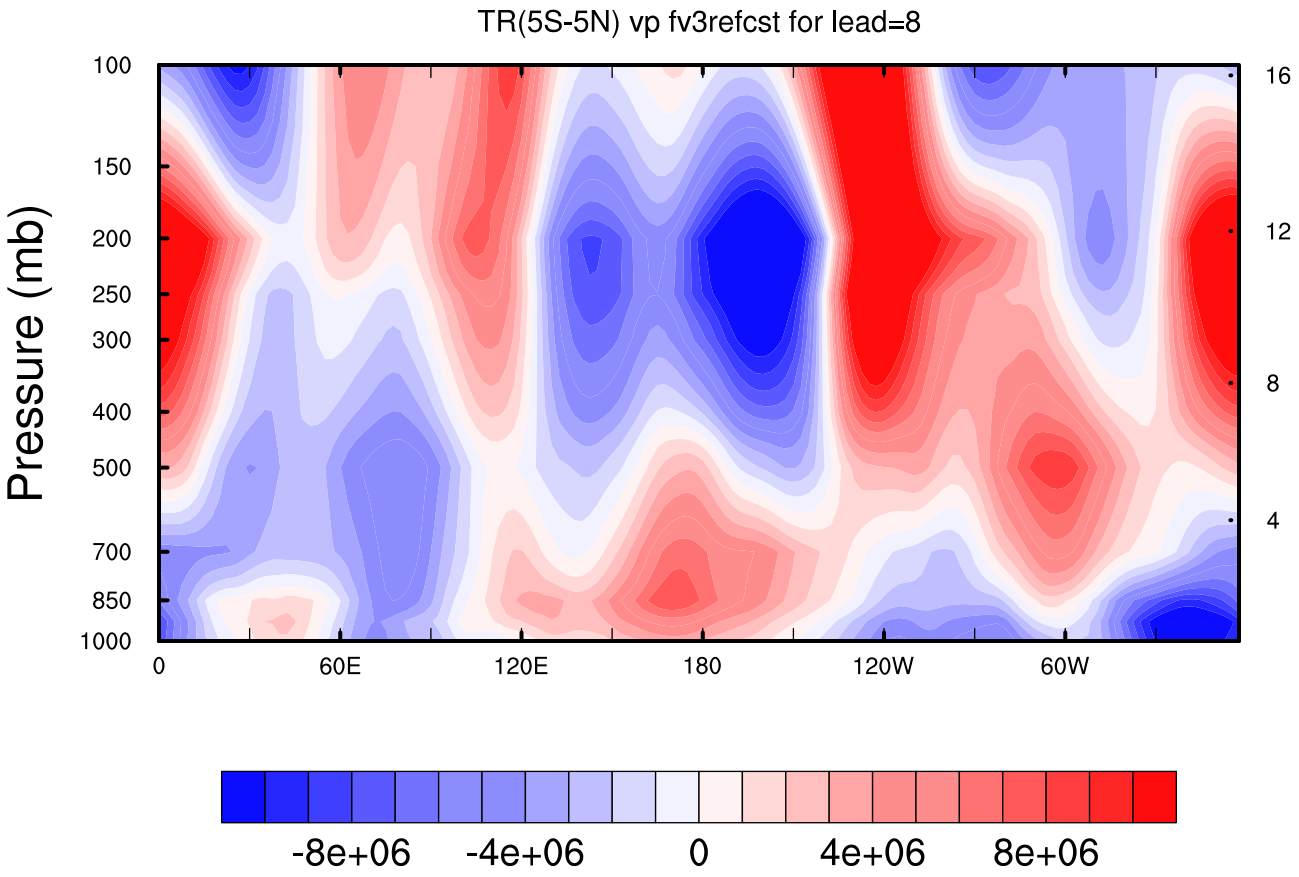

TRP(120E-120W) sf fv3refcst for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

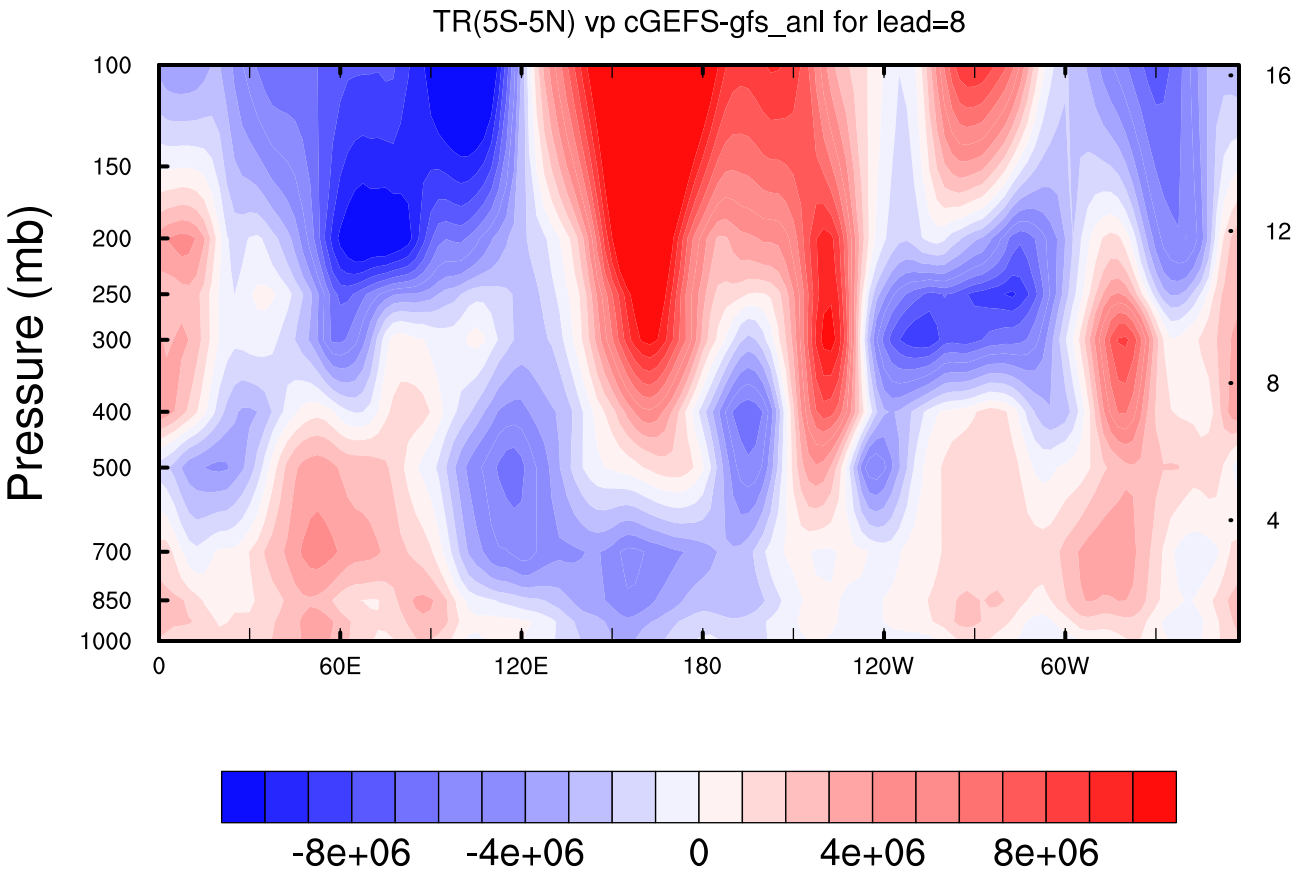

TRP(120E-120W) sf cGEFS-gfs_anl for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06


TRP(120E-120W) sf fv3refcst-gfs_anl for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06


TR(5S-5N) vp anl for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS-gfs_anl for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
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120W
60W
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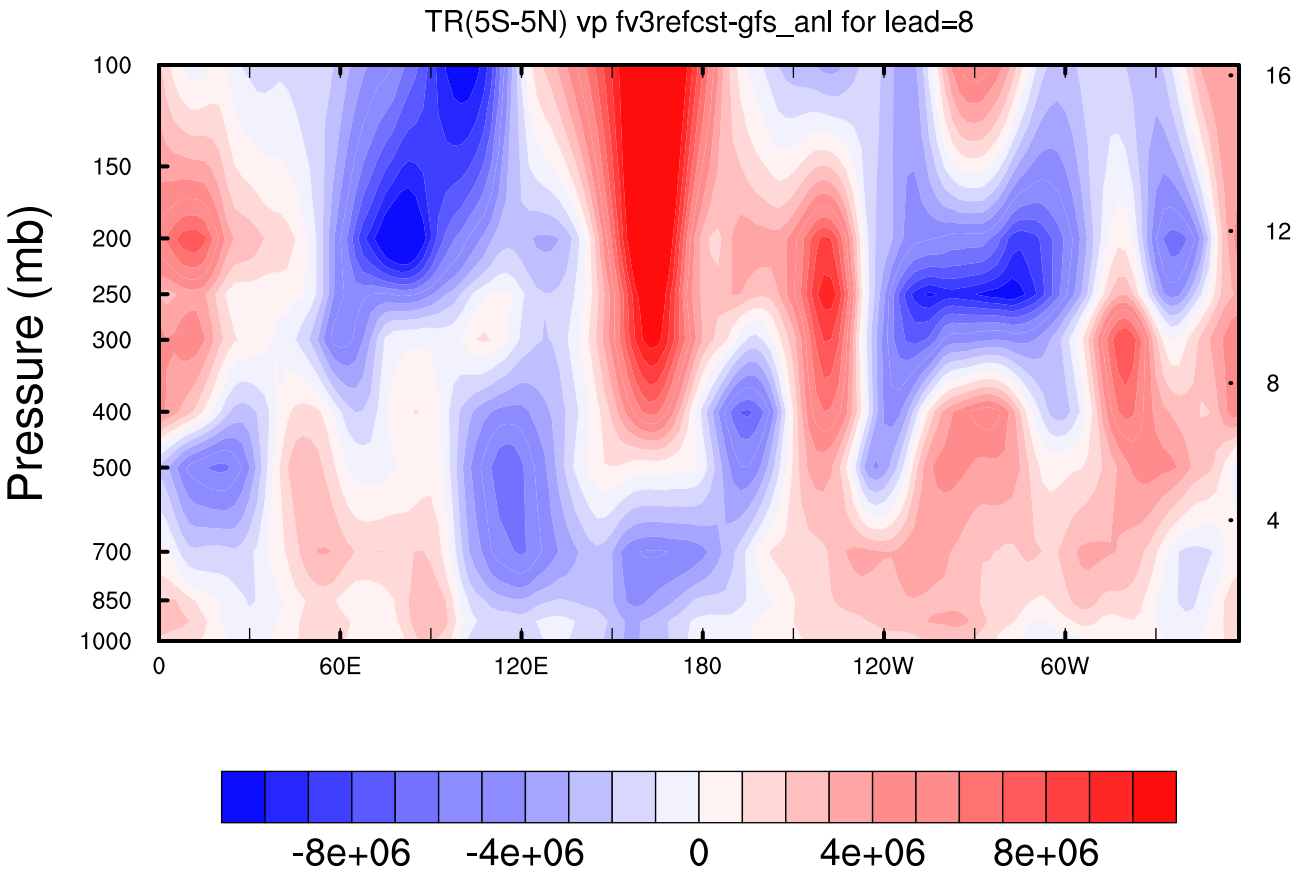
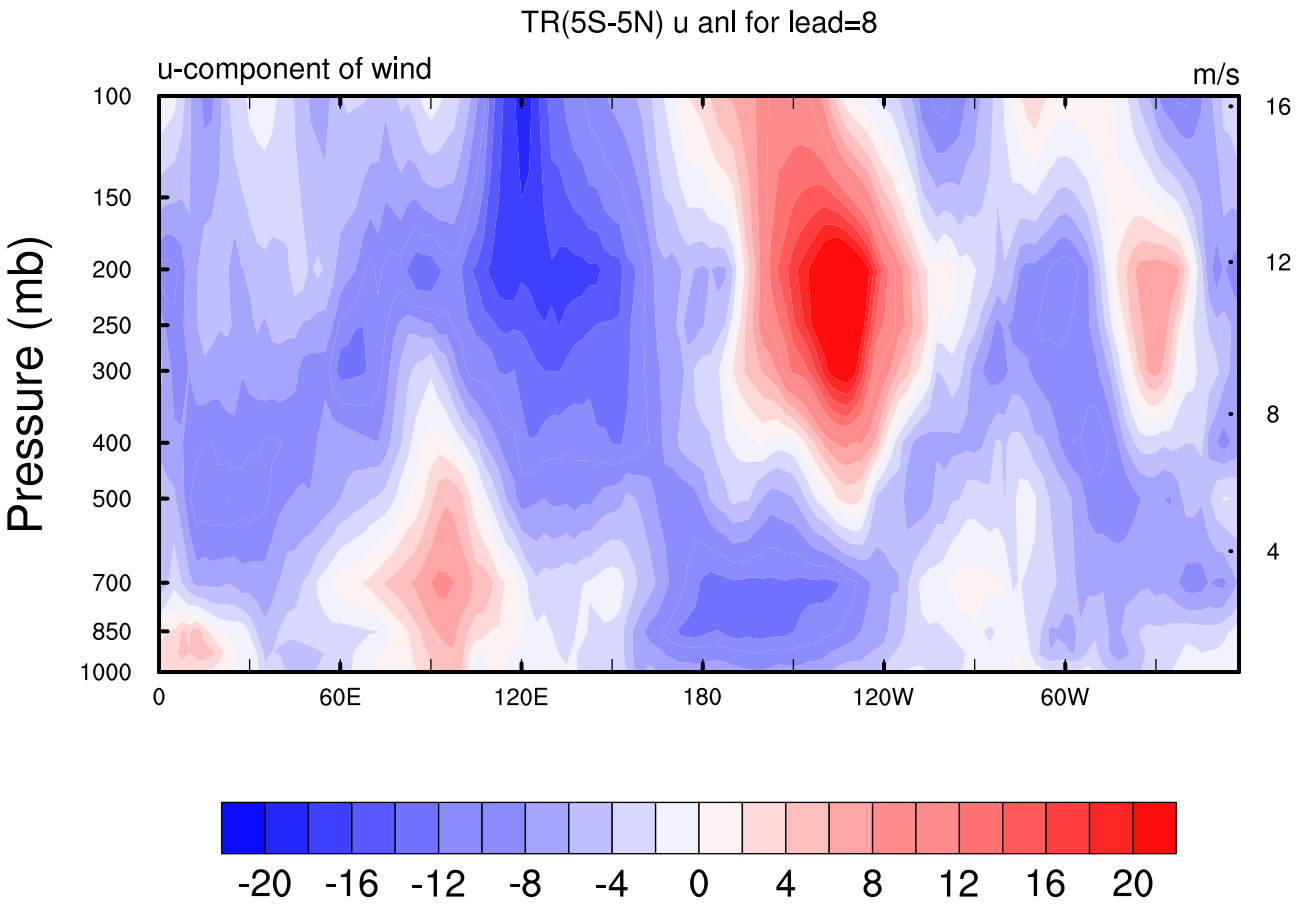
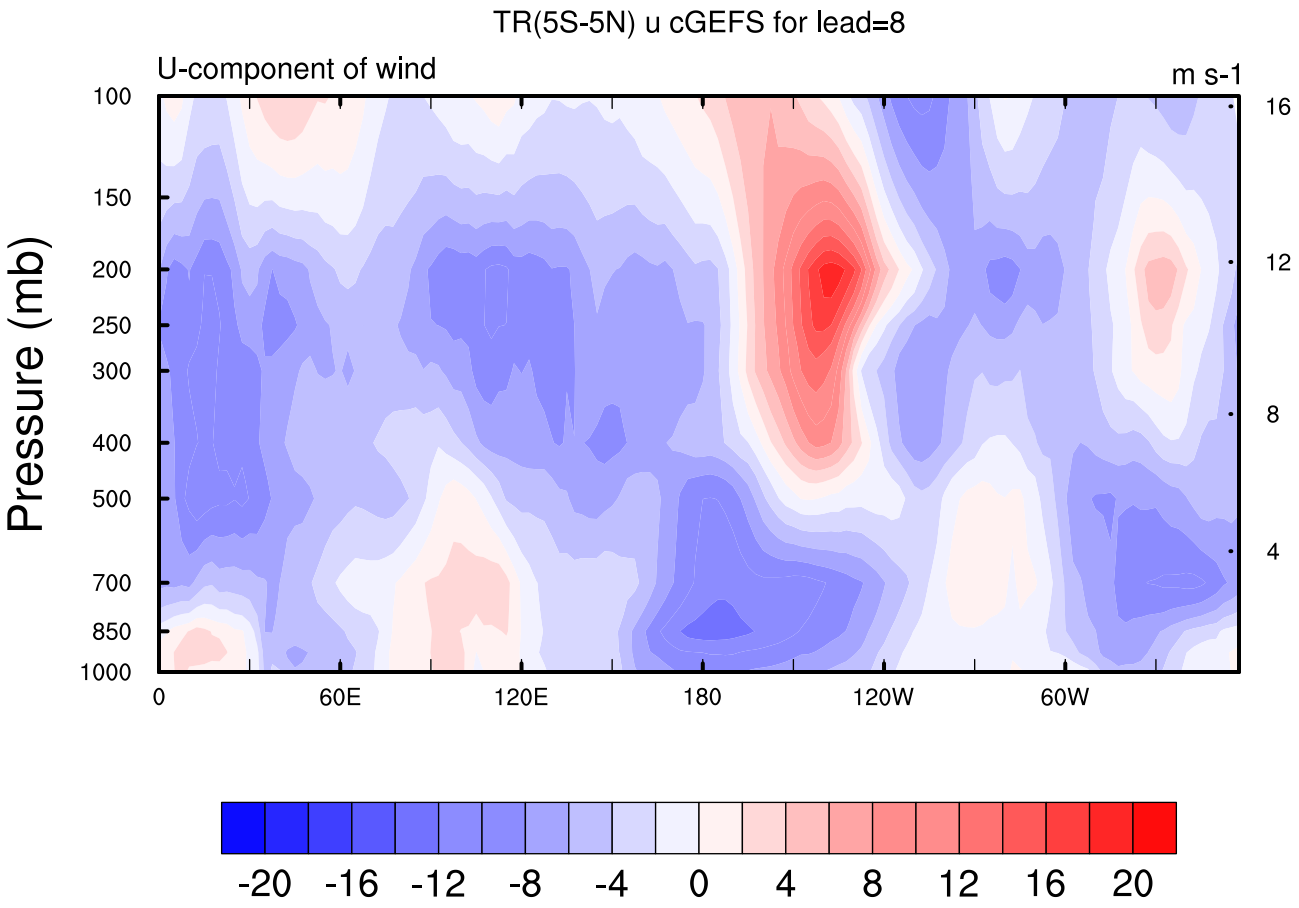
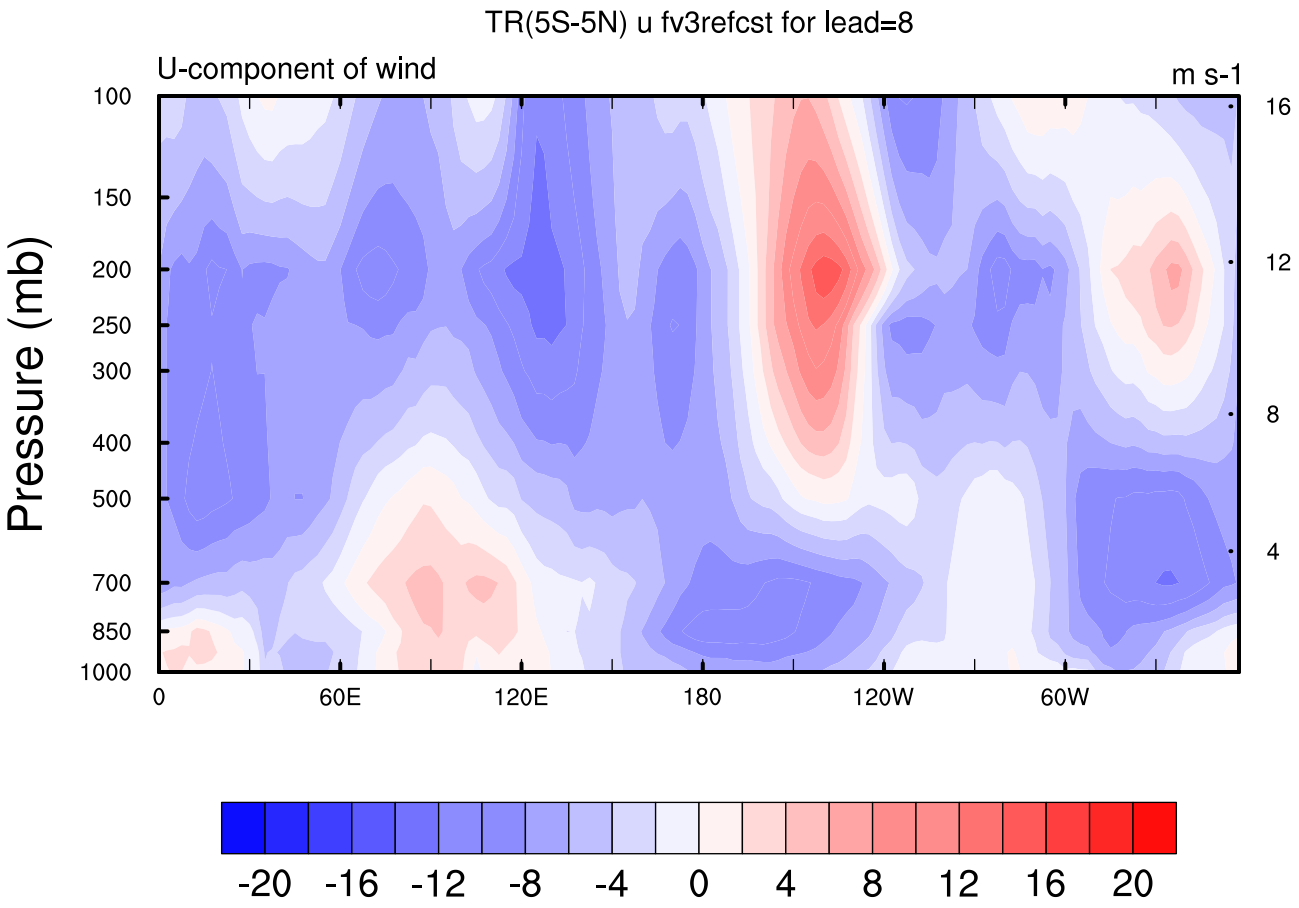
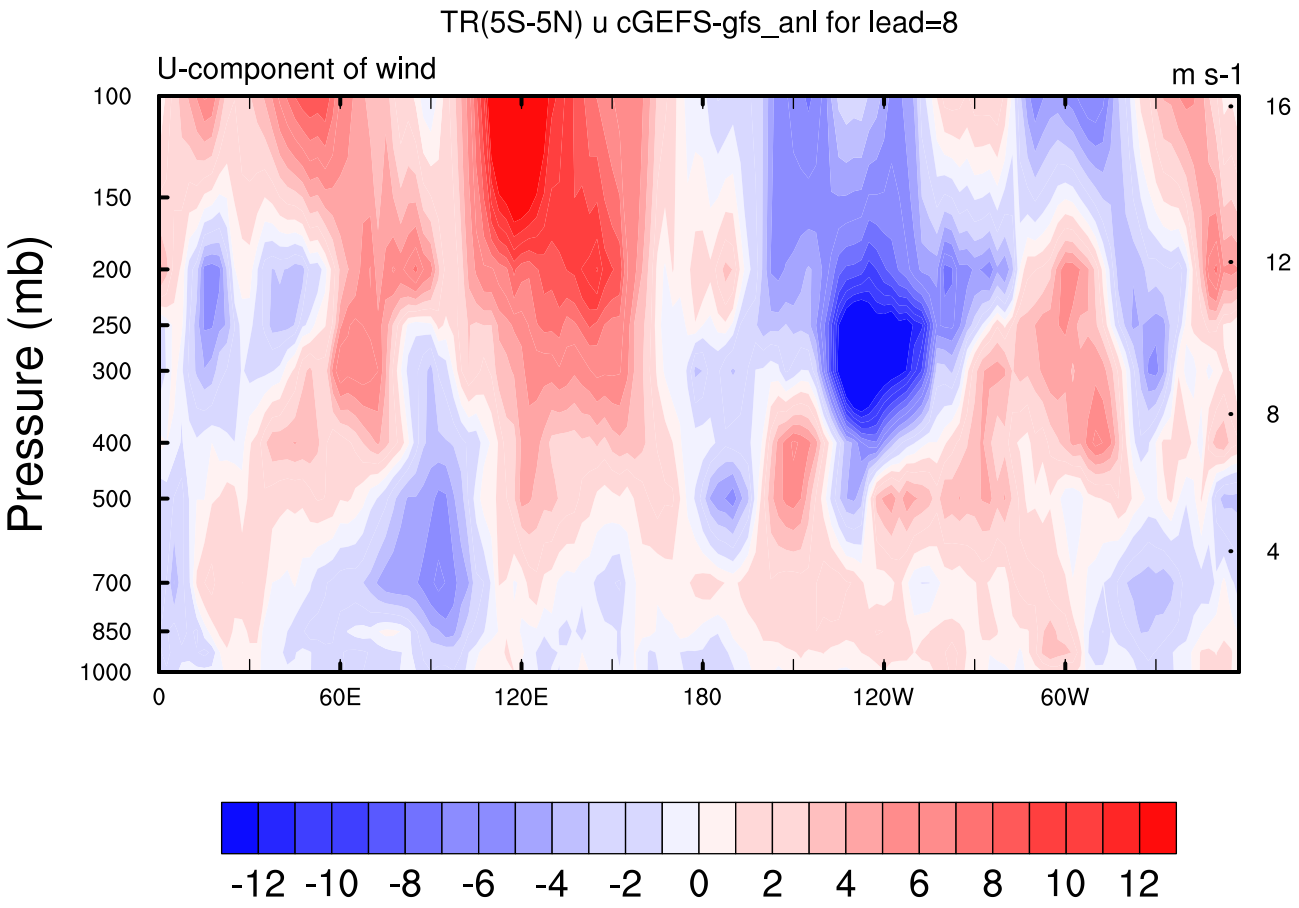
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

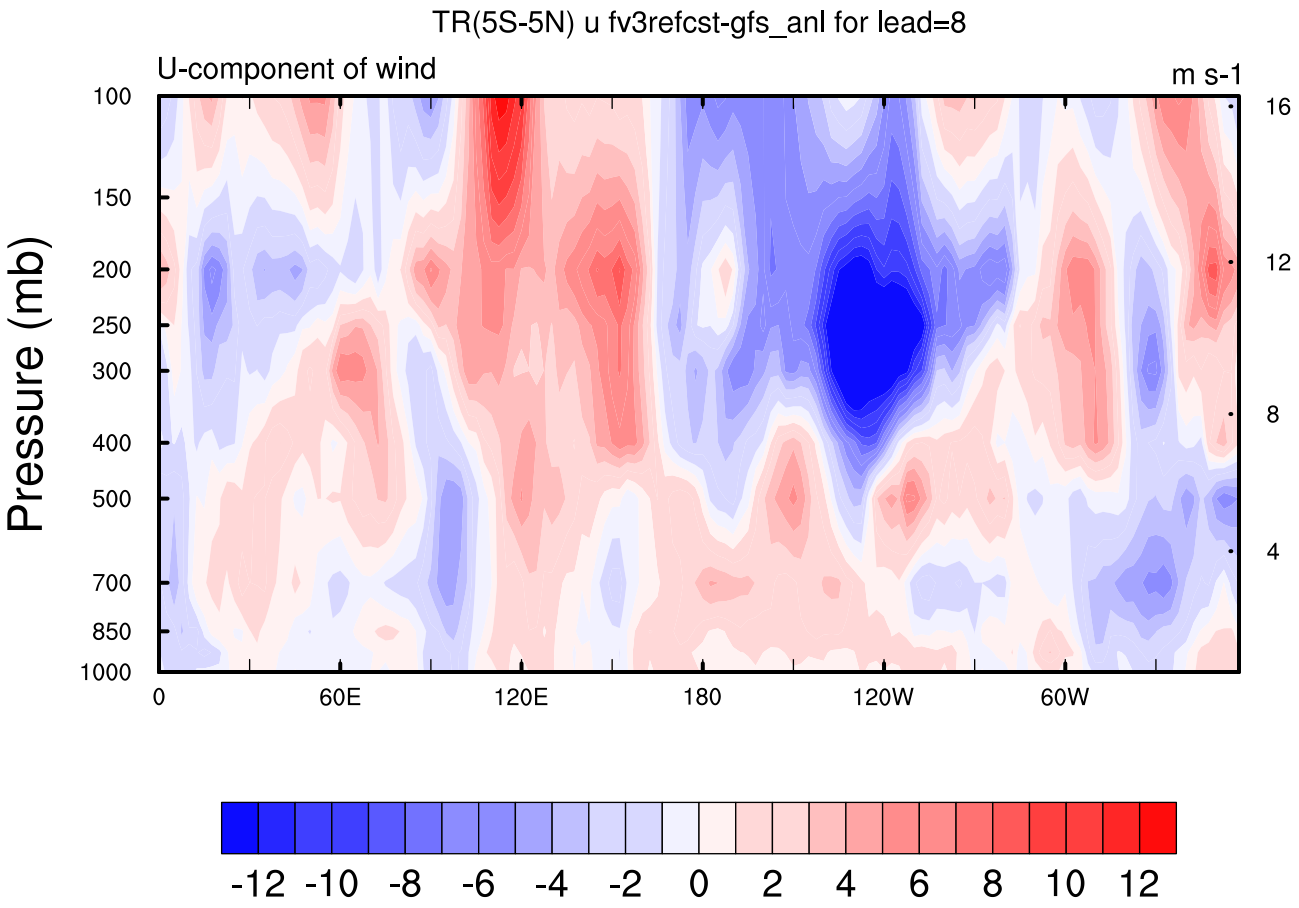

TR(5S-5N) vp fv3refcst-gfs_anl for lead=8
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

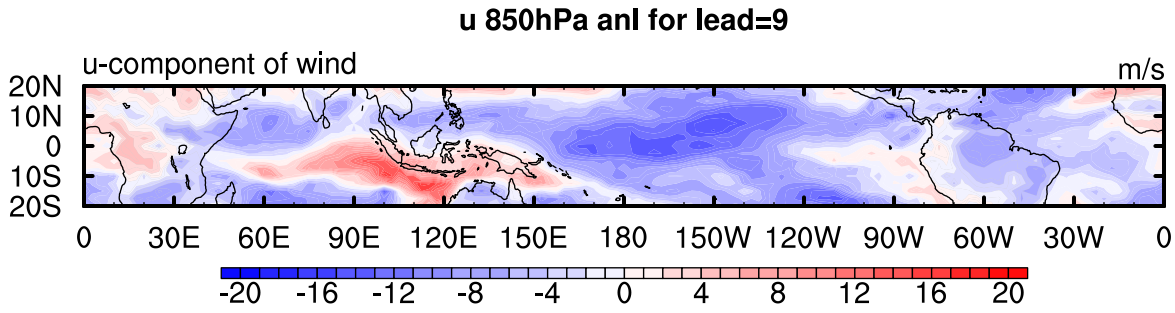

TR(5S-5N) u anl for lead=8
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

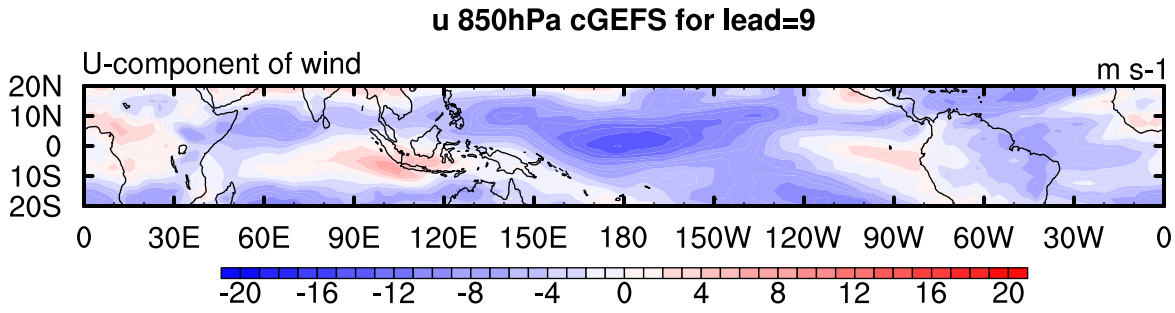

TR(5S-5N) u cGEFS for lead=8
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

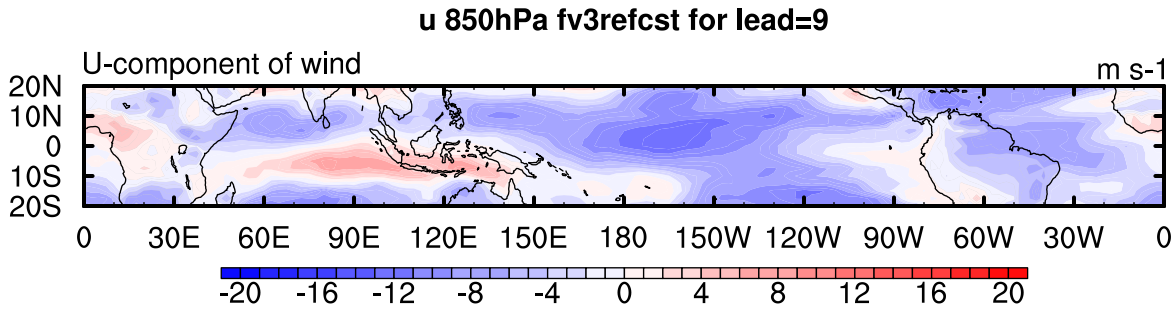

TR(5S-5N) u fv3refcst for lead=8
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=8
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=8
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


u 850hPa anl for lead=9
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS for lead=9
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa fv3refcst for lead=9
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-20
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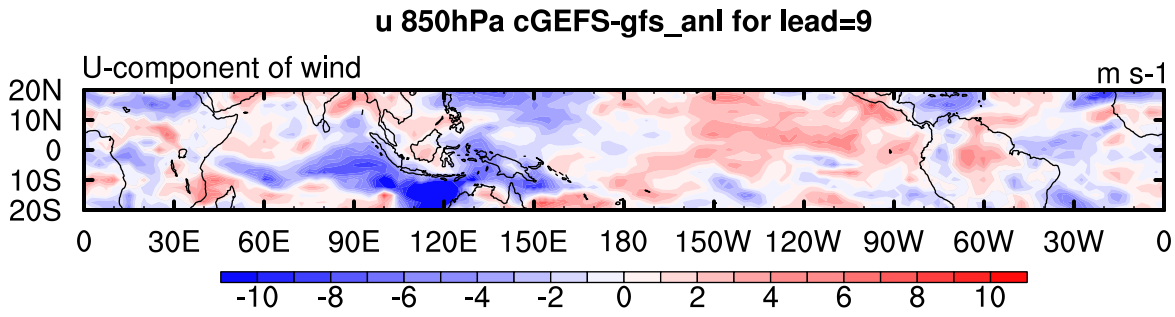
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=9
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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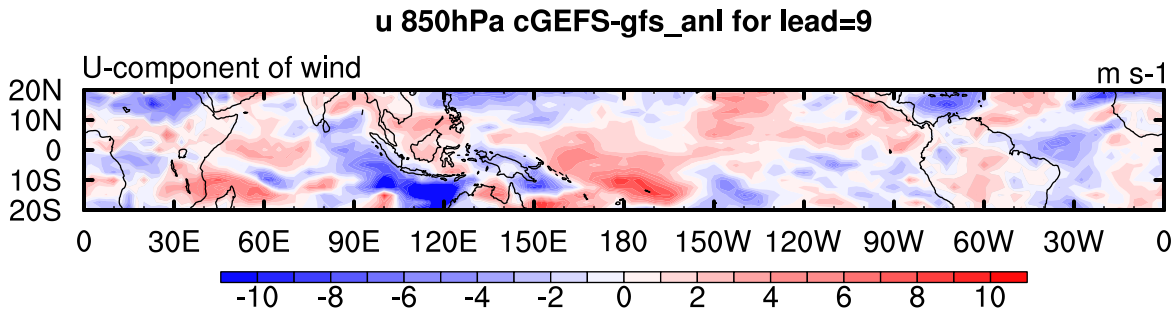
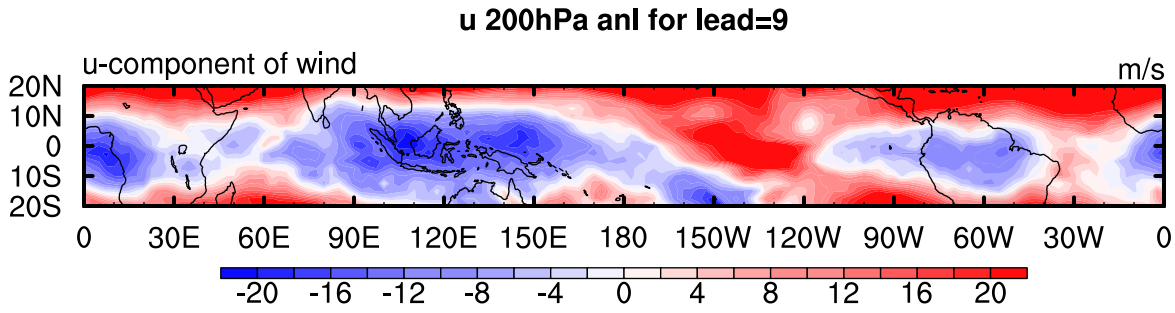
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 850hPa cGEFS-gfs_anl for lead=9
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=9
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-20
-16
-12
-8
-4
0
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8
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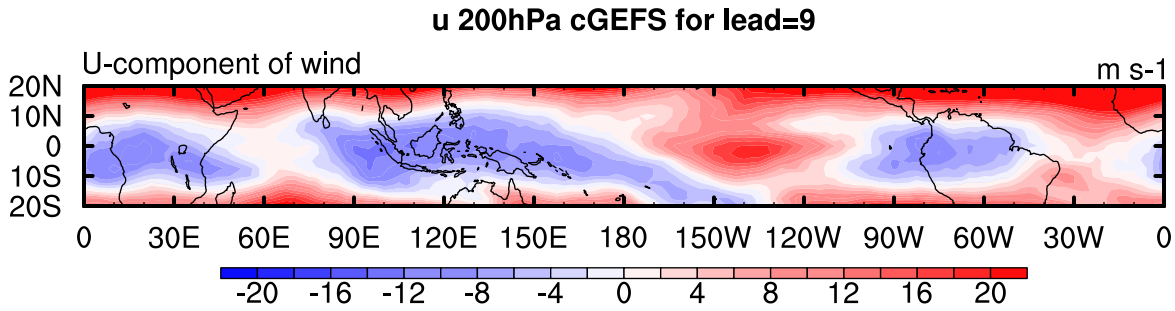
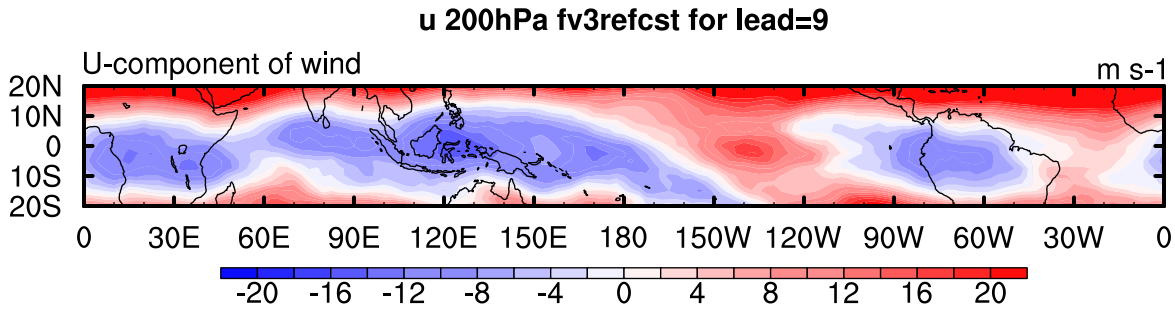
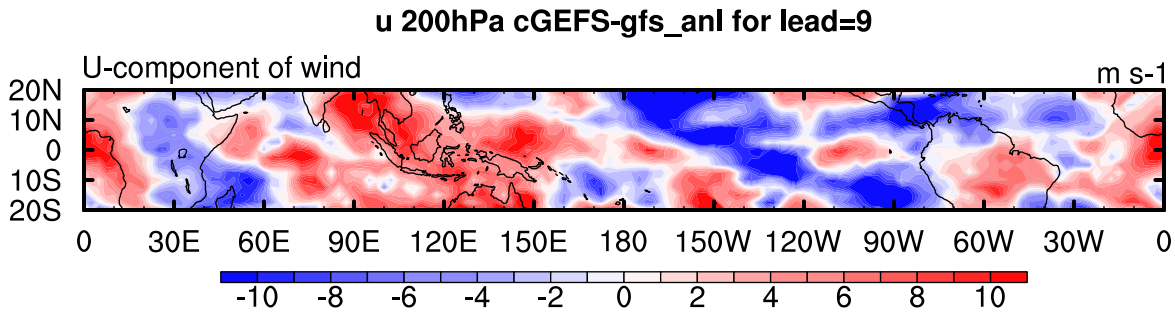
16
20


u 200hPa cGEFS for lead=9
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=9
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=9
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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-10
-8
-6
-4
-2
0
2
4
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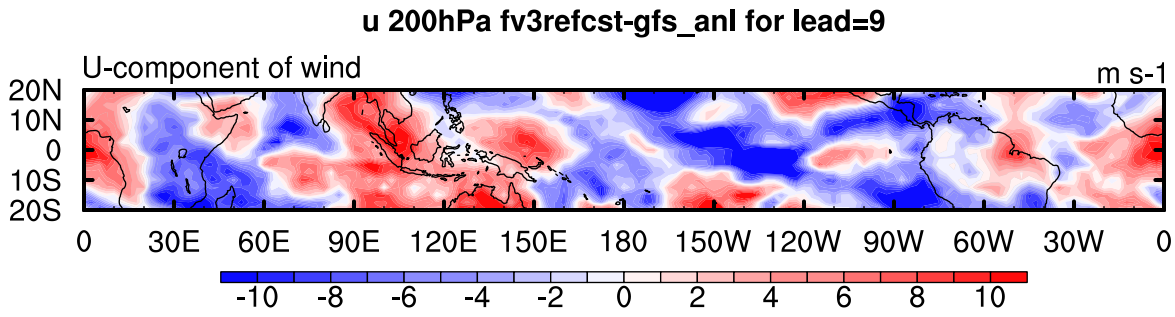
8
10


u 200hPa fv3refcst-gfs_anl for lead=9
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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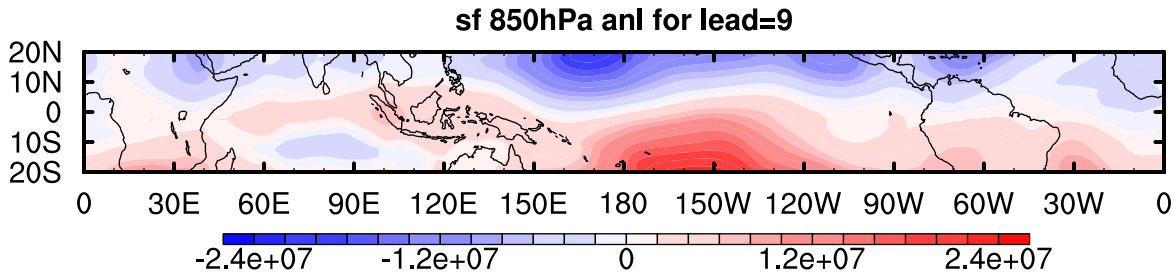
sf 850hPa anl for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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60W
30W
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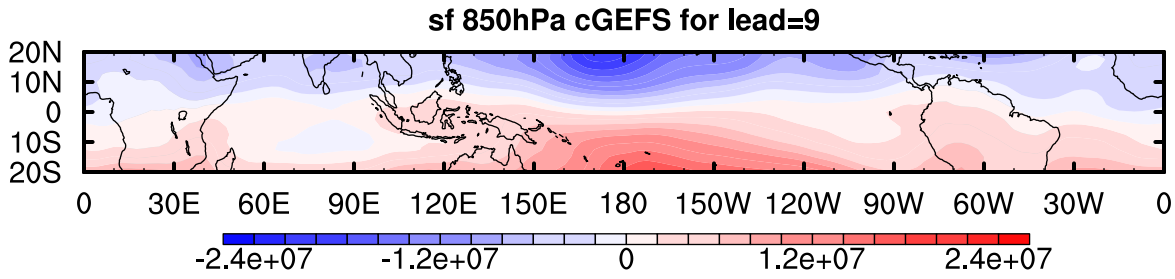
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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60W
30W
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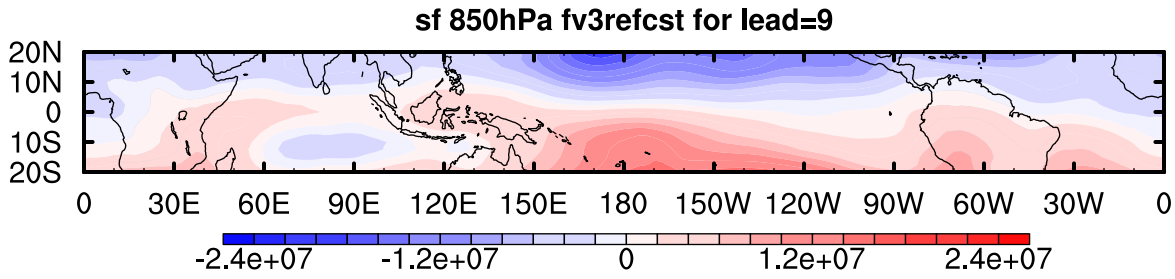
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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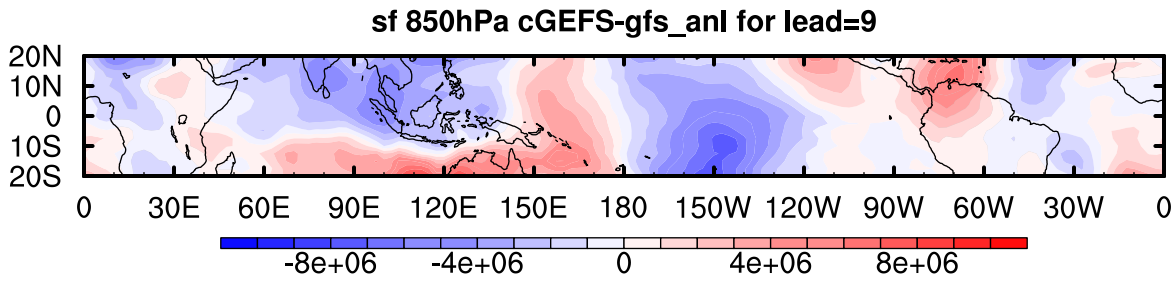
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
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180
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120W
90W
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30W
0
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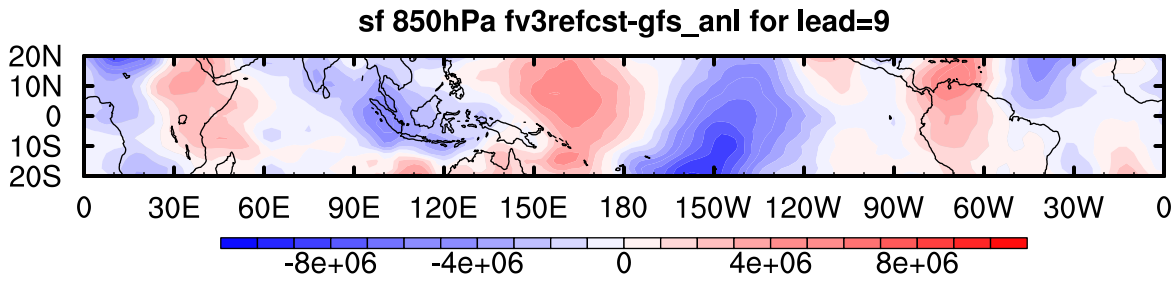
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
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90W
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30W
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-4e+06
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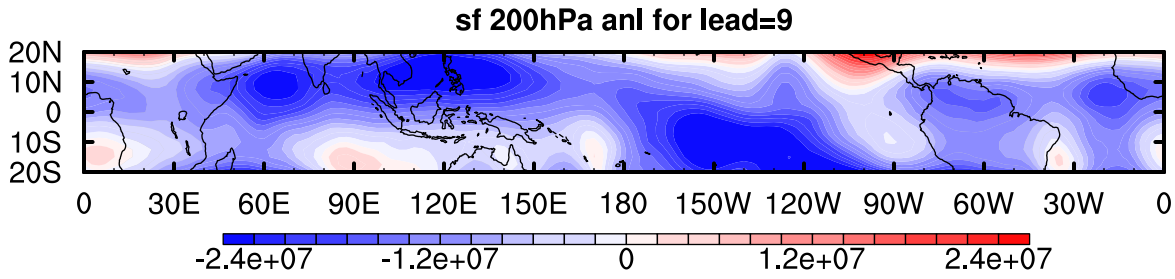
8e+06


sf 200hPa anl for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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60W
30W
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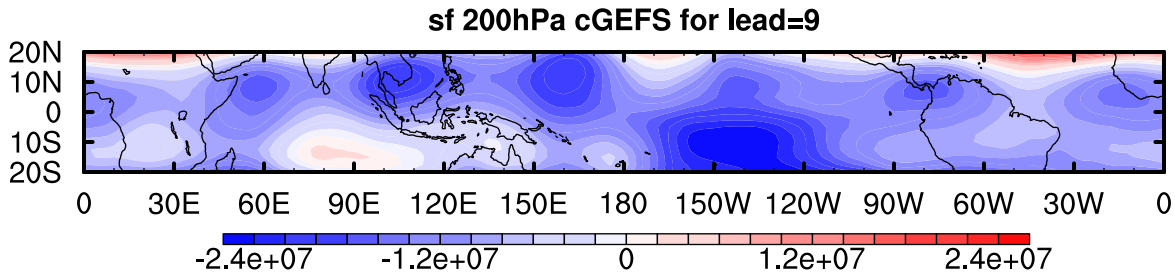
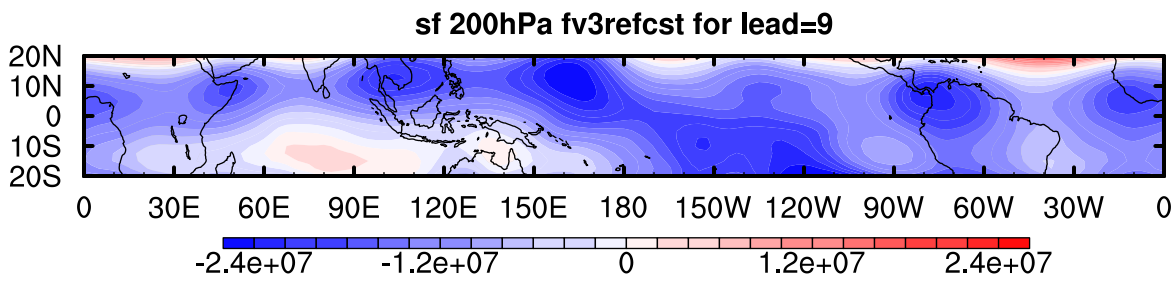
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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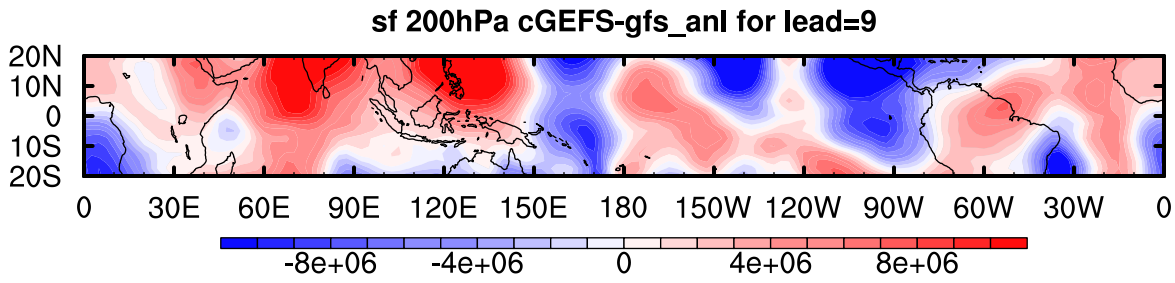
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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-4e+06
0
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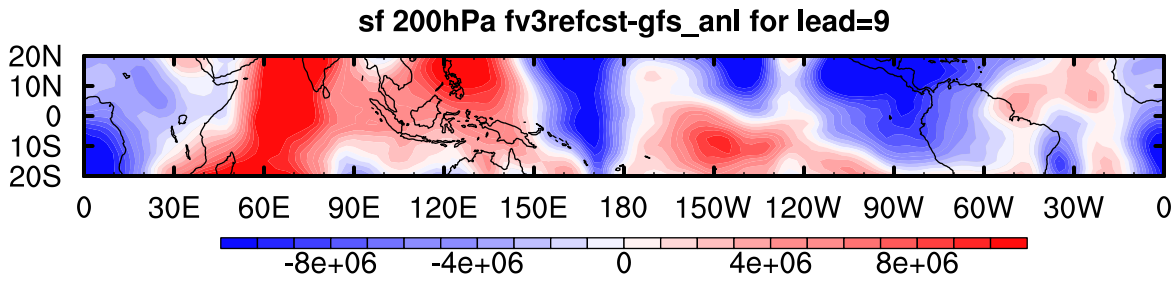
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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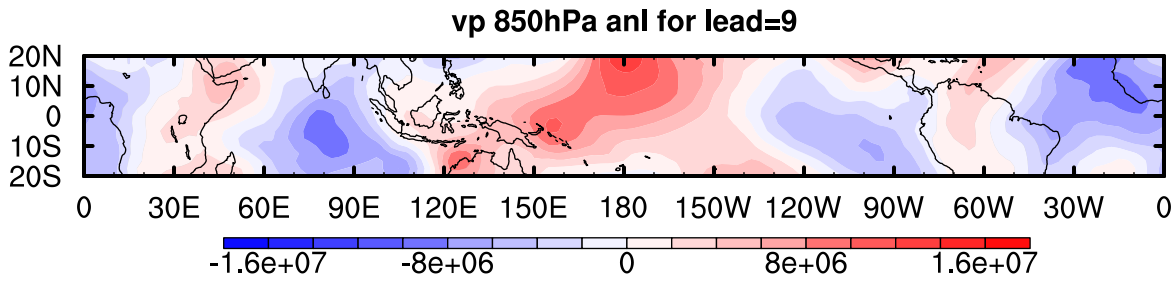
-4e+06
0
4e+06
8e+06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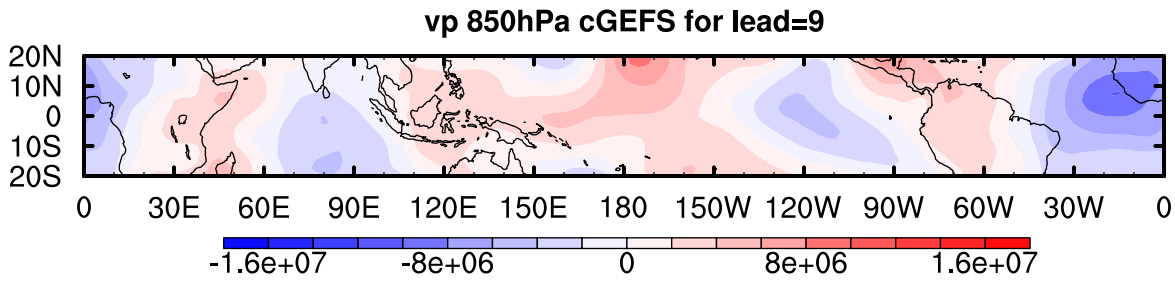
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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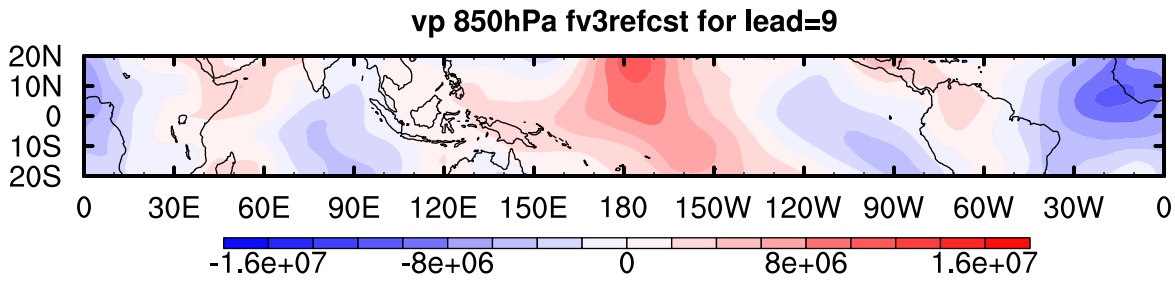
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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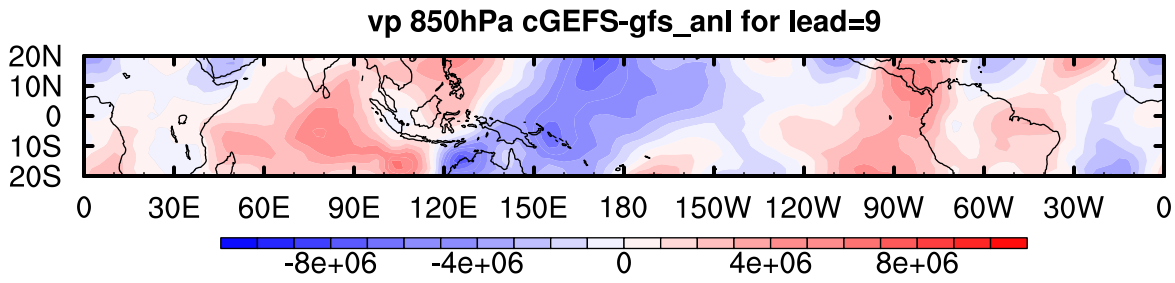
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
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180
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90W
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30W
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-4e+06
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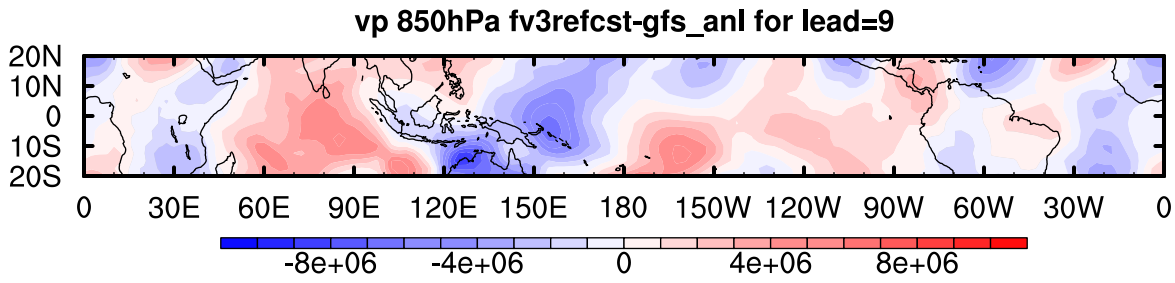
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
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150E
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120W
90W
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30W
0
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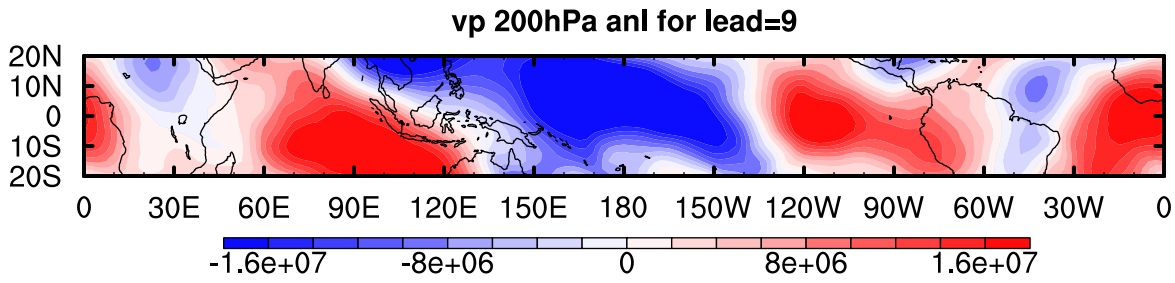
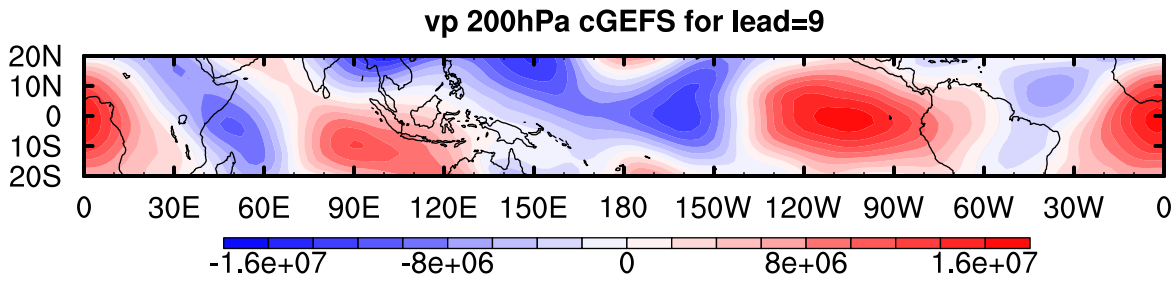
-4e+06
0
4e+06
8e+06


vp 200hPa anl for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa cGEFS for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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150W
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90W
60W
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-1.6e+07
-8e+06
0
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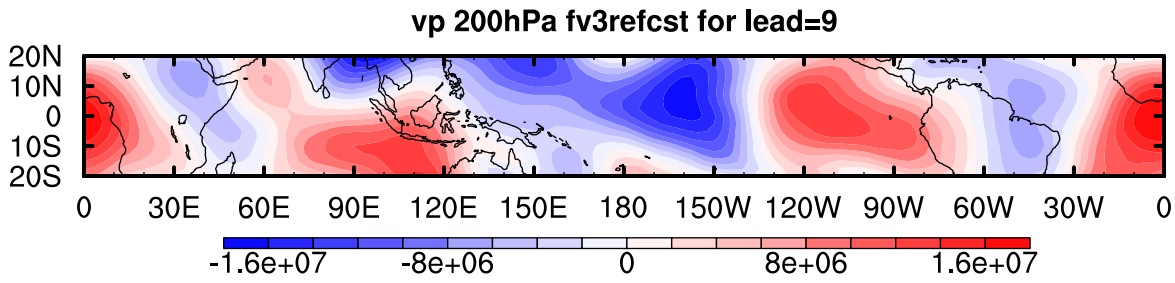
1.6e+07


vp 200hPa fv3refcst for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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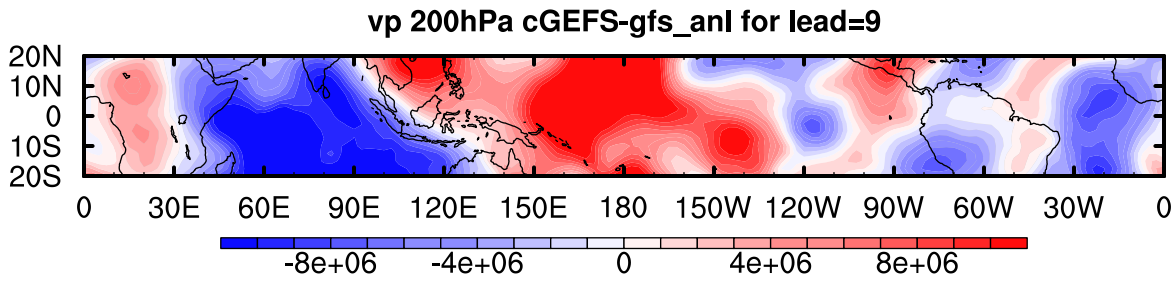
1.6e+07


vp 200hPa cGEFS-gfs_anl for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
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180
150W
120W
90W
60W
30W
0
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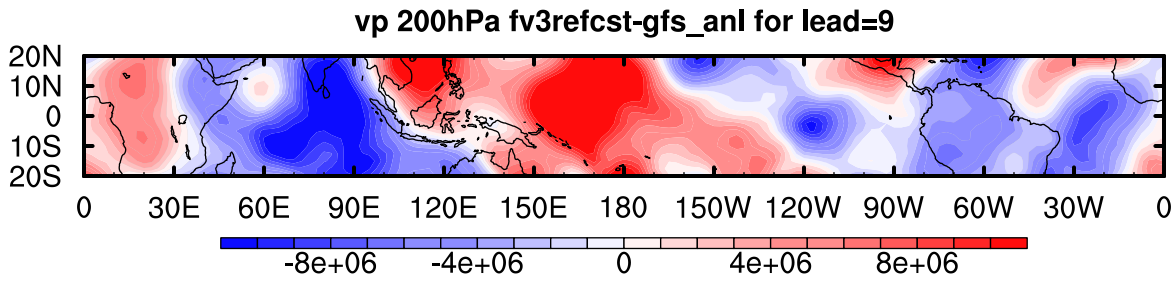
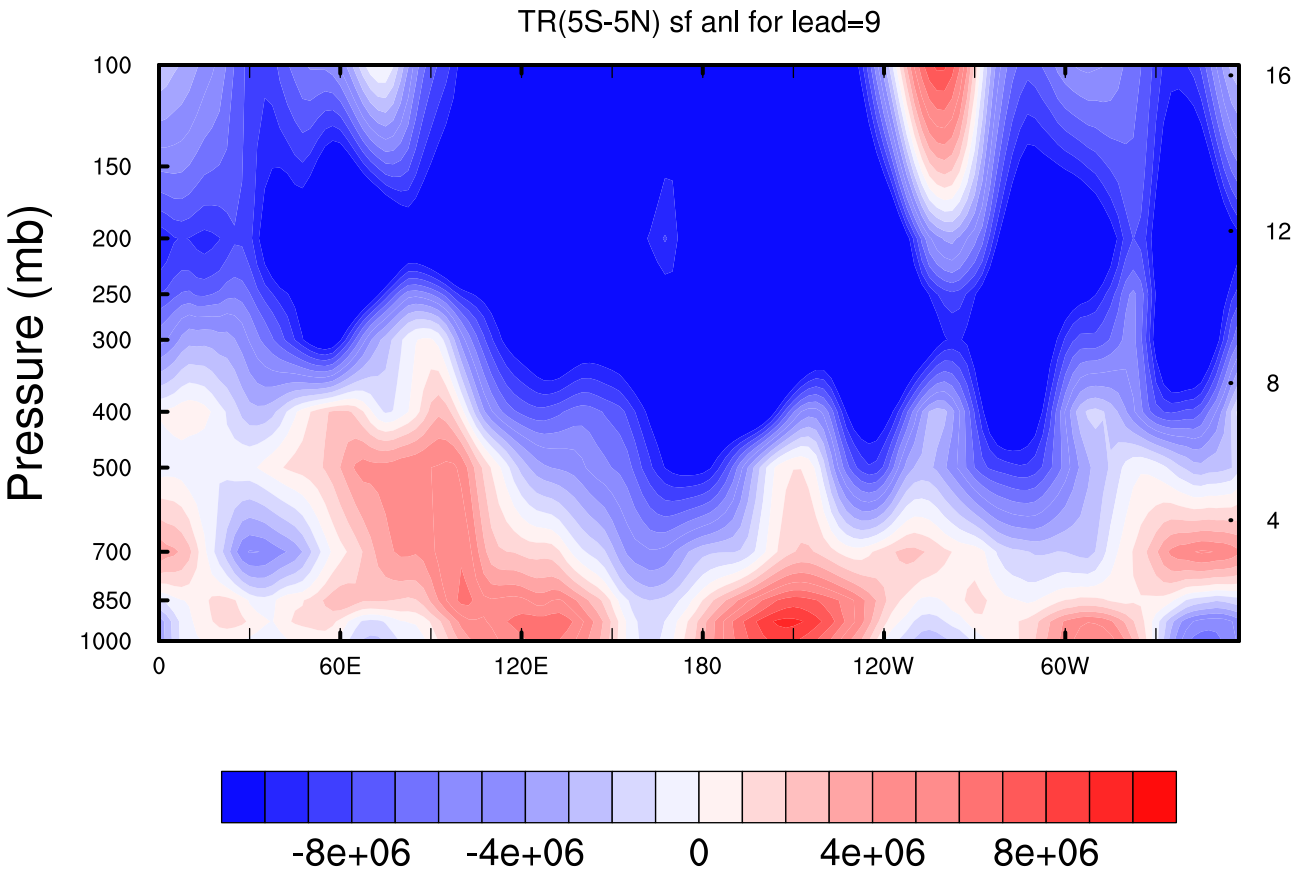
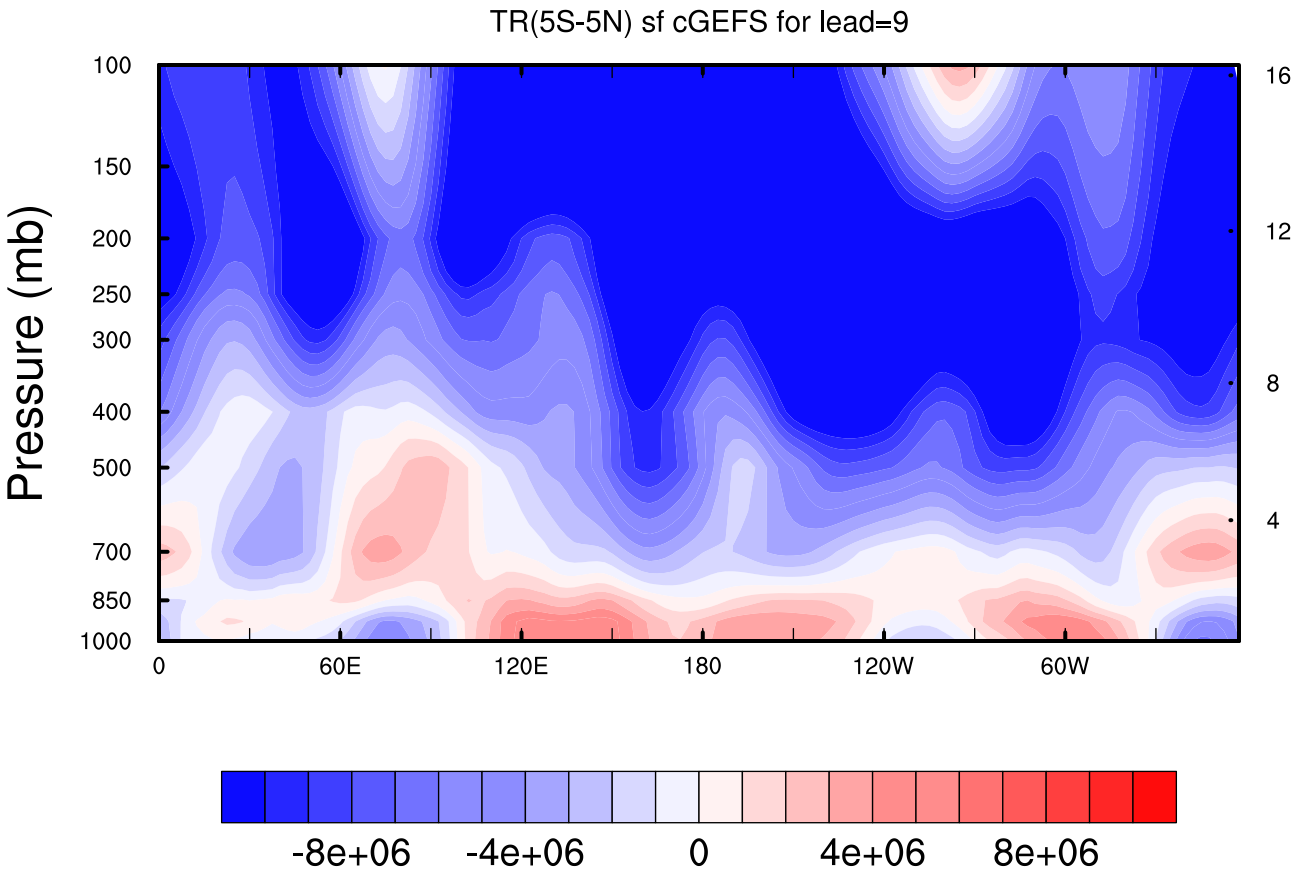
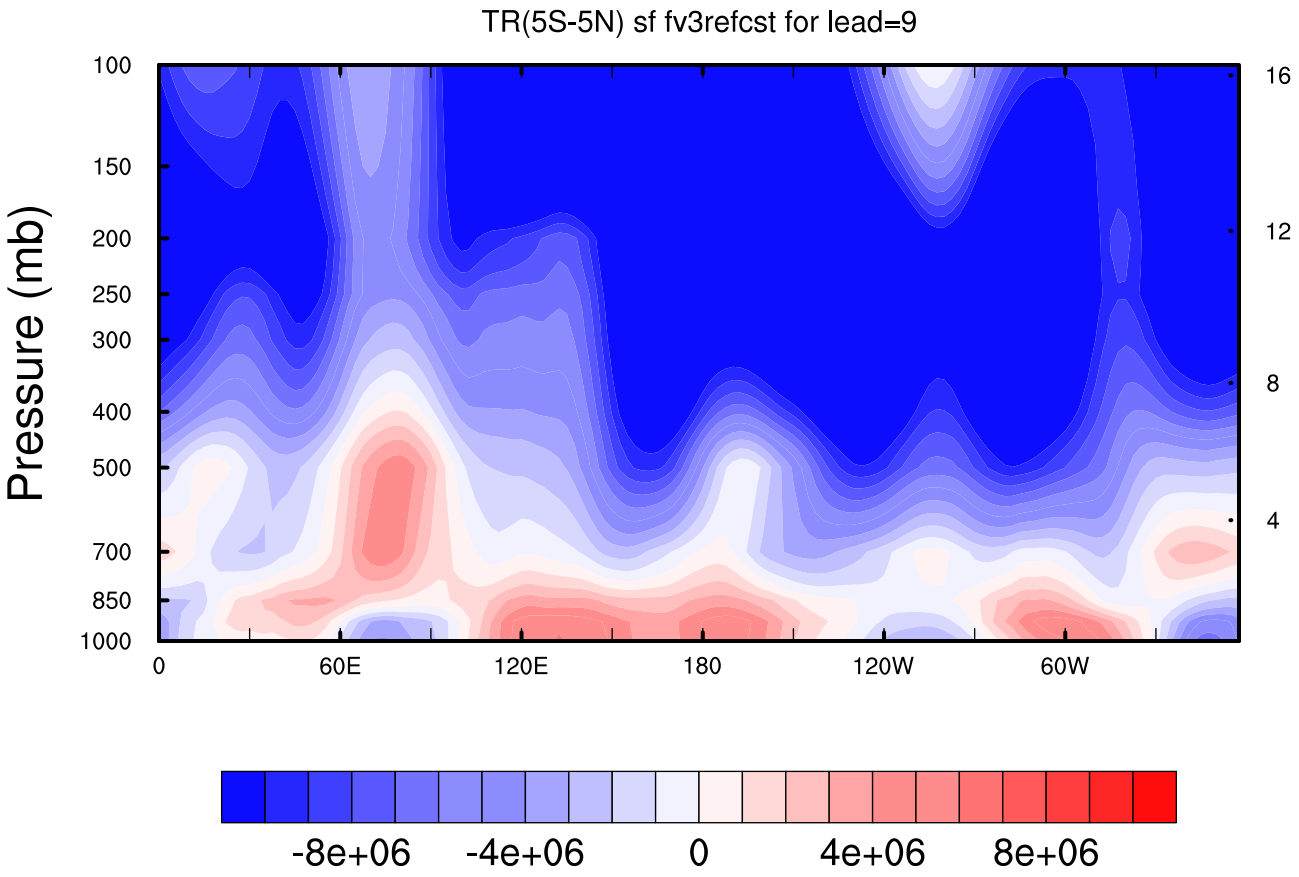
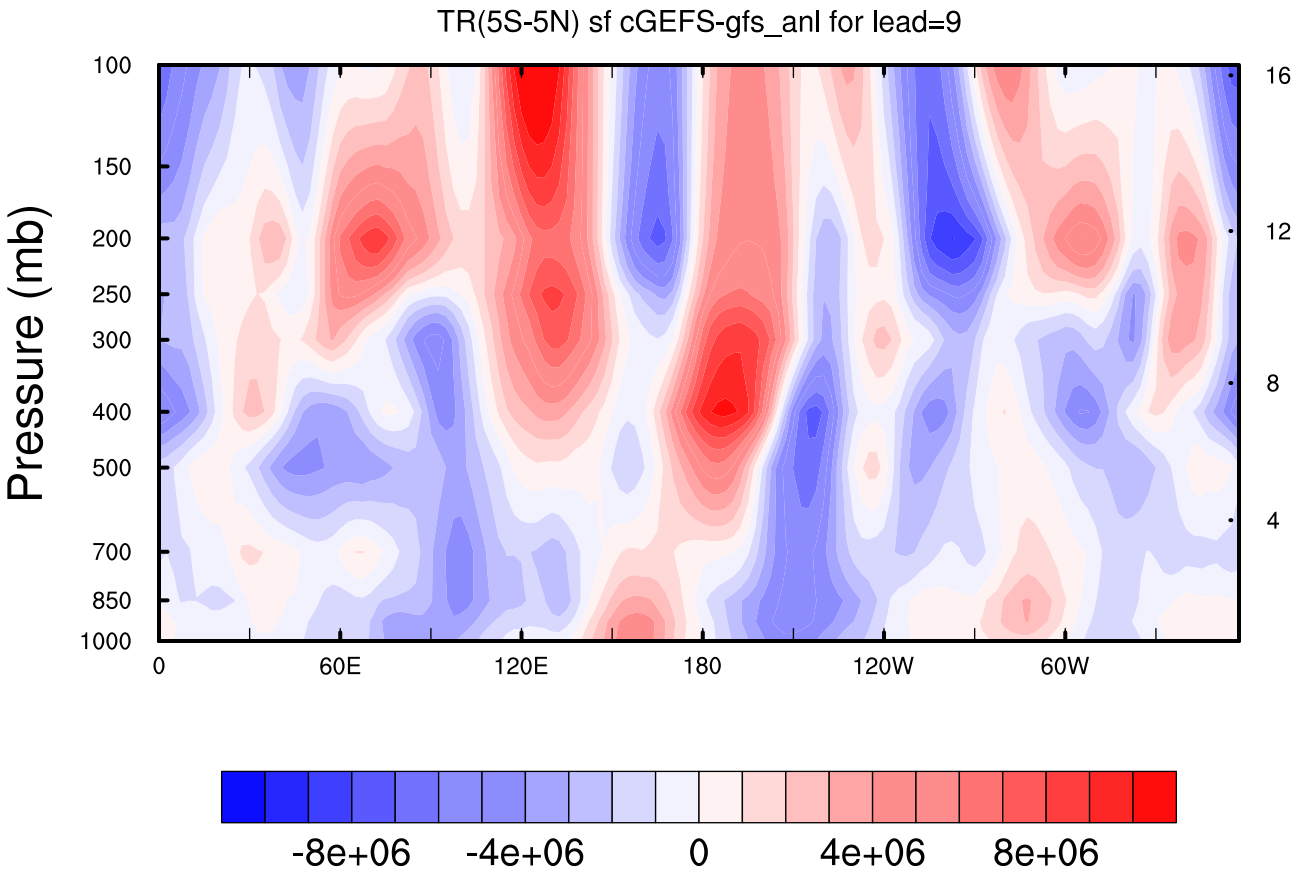
-4e+06
0
4e+06
8e+06

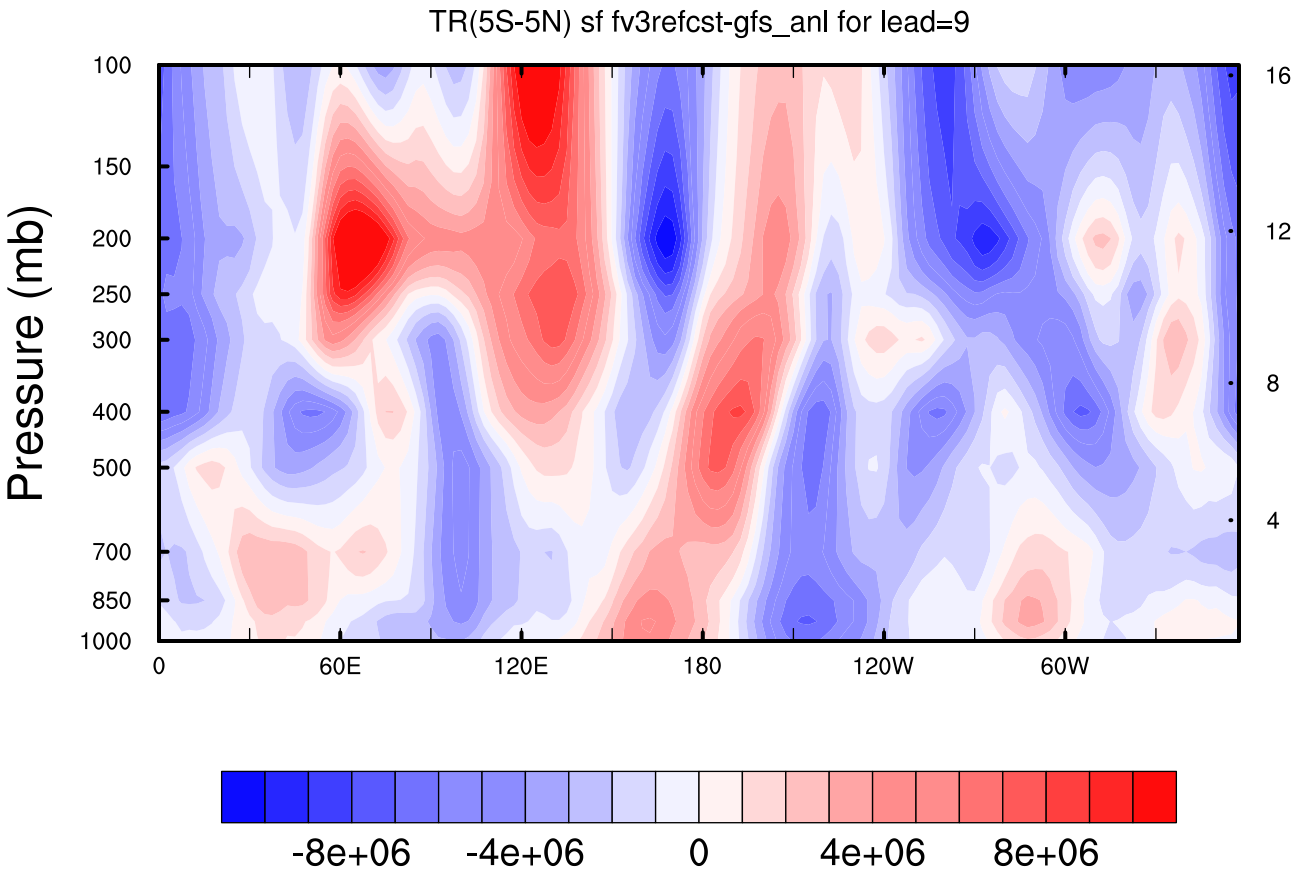

vp 200hPa fv3refcst-gfs_anl for lead=9
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

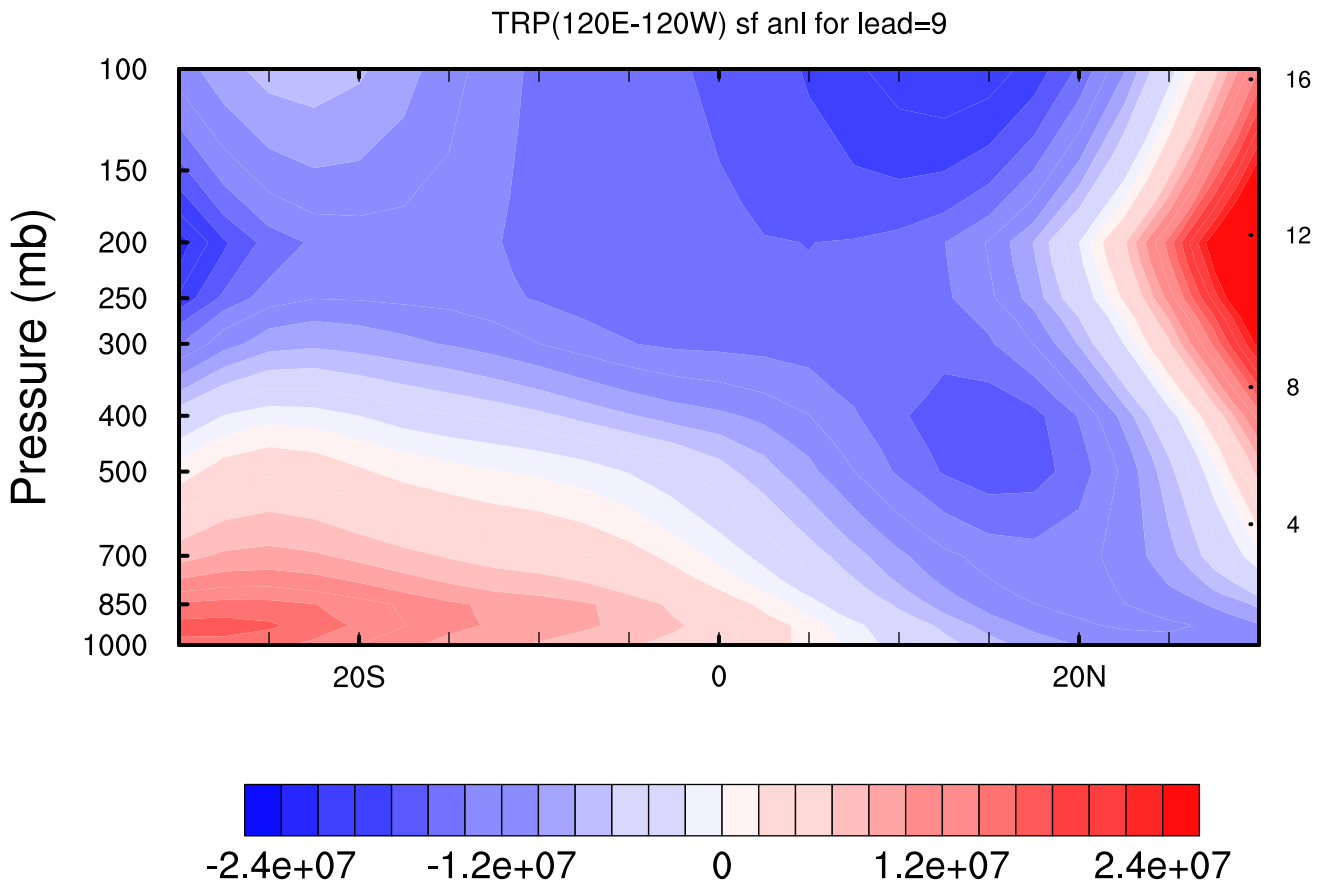

TR(5S-5N) sf anl for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

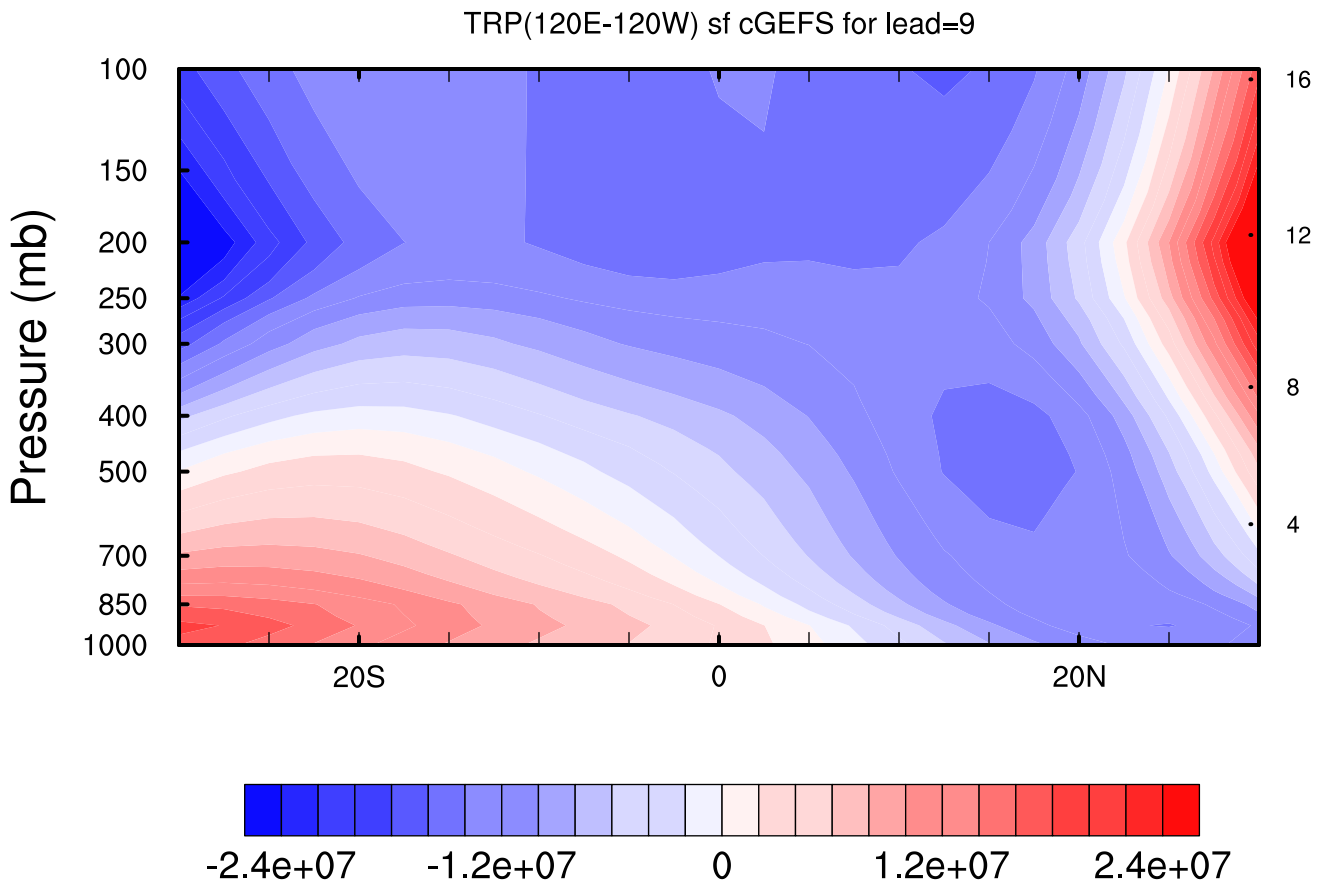

TR(5S-5N) sf cGEFS for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

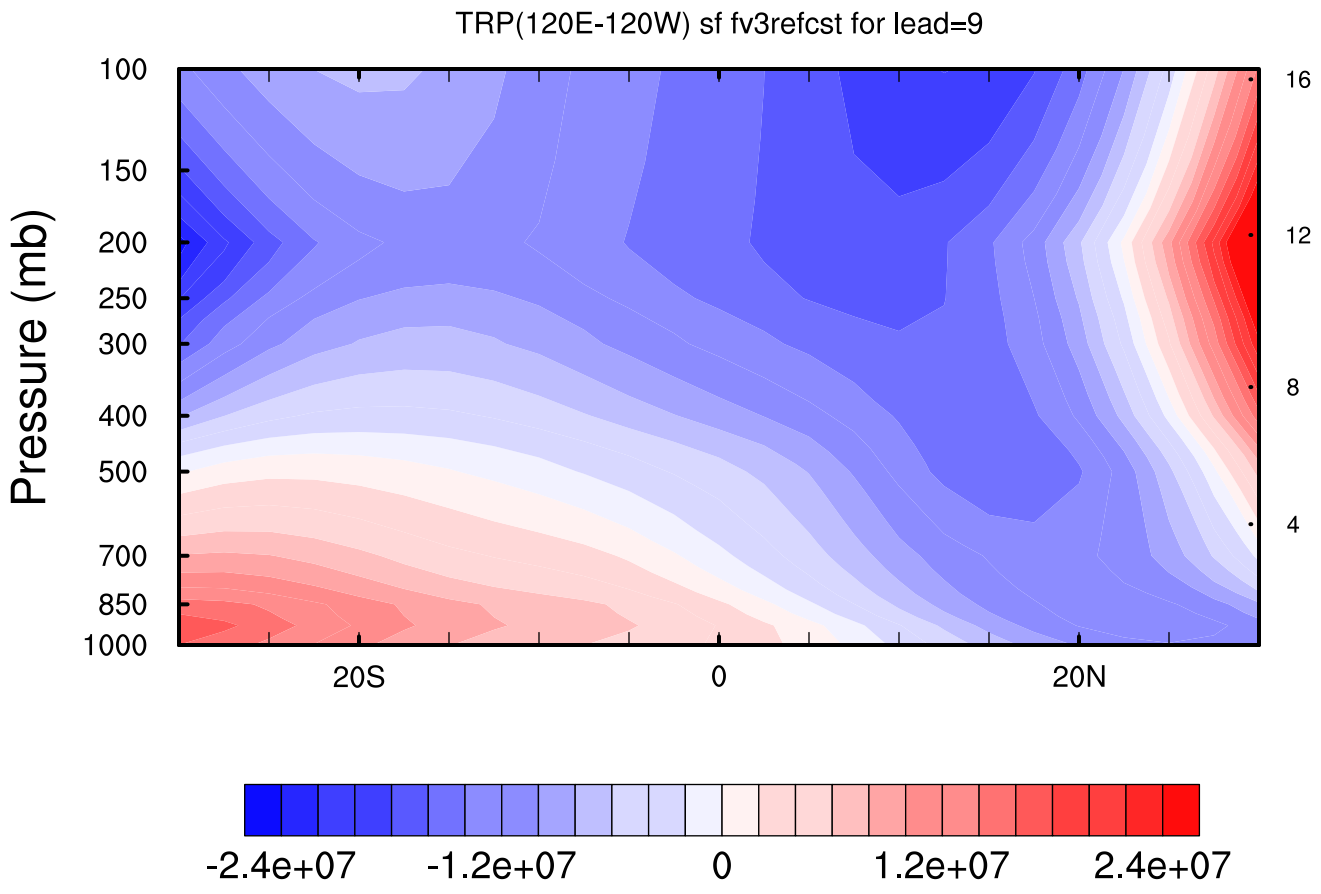

TR(5S-5N) sf fv3refcst for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

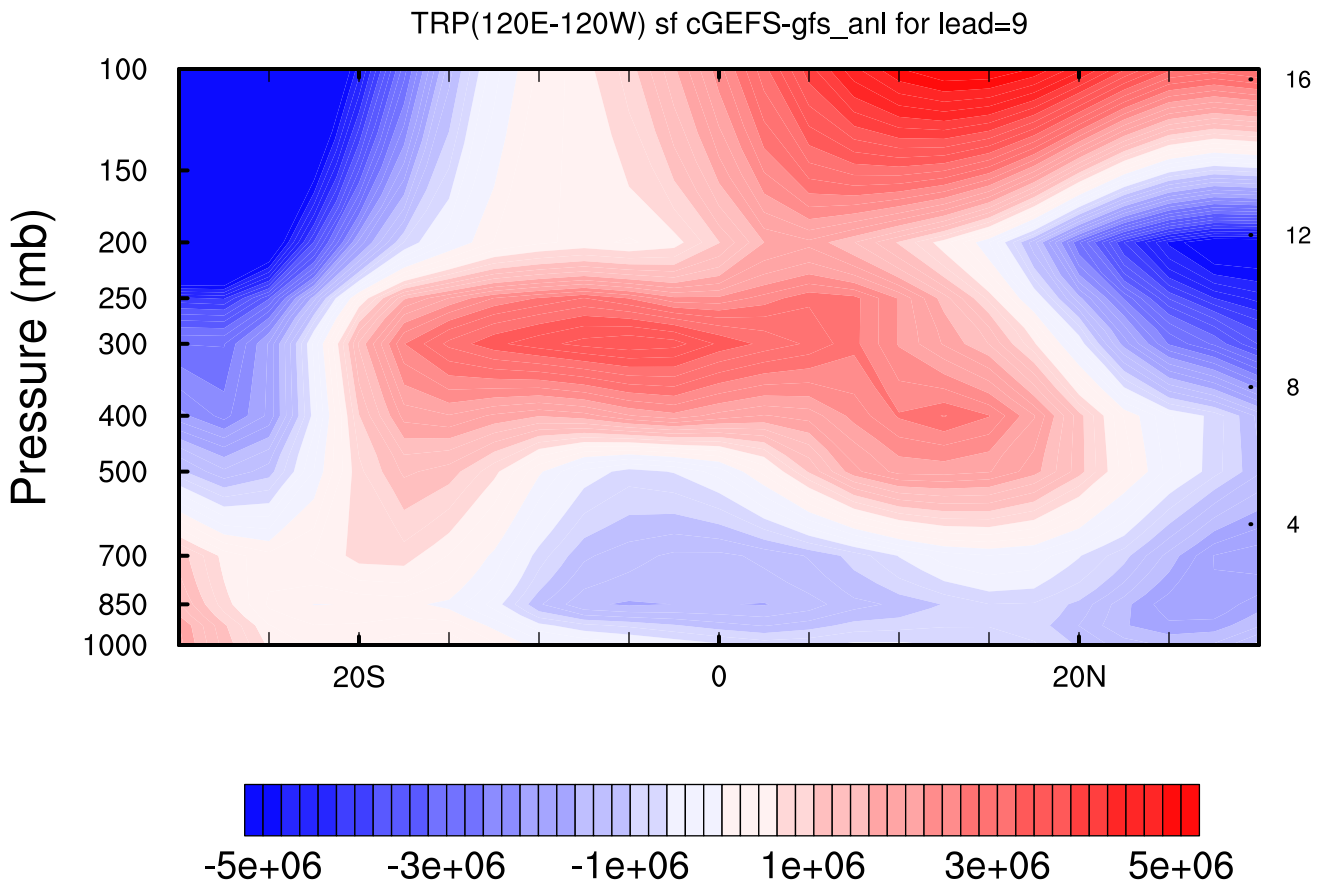

TR(5S-5N) sf cGEFS-gfs_anl for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

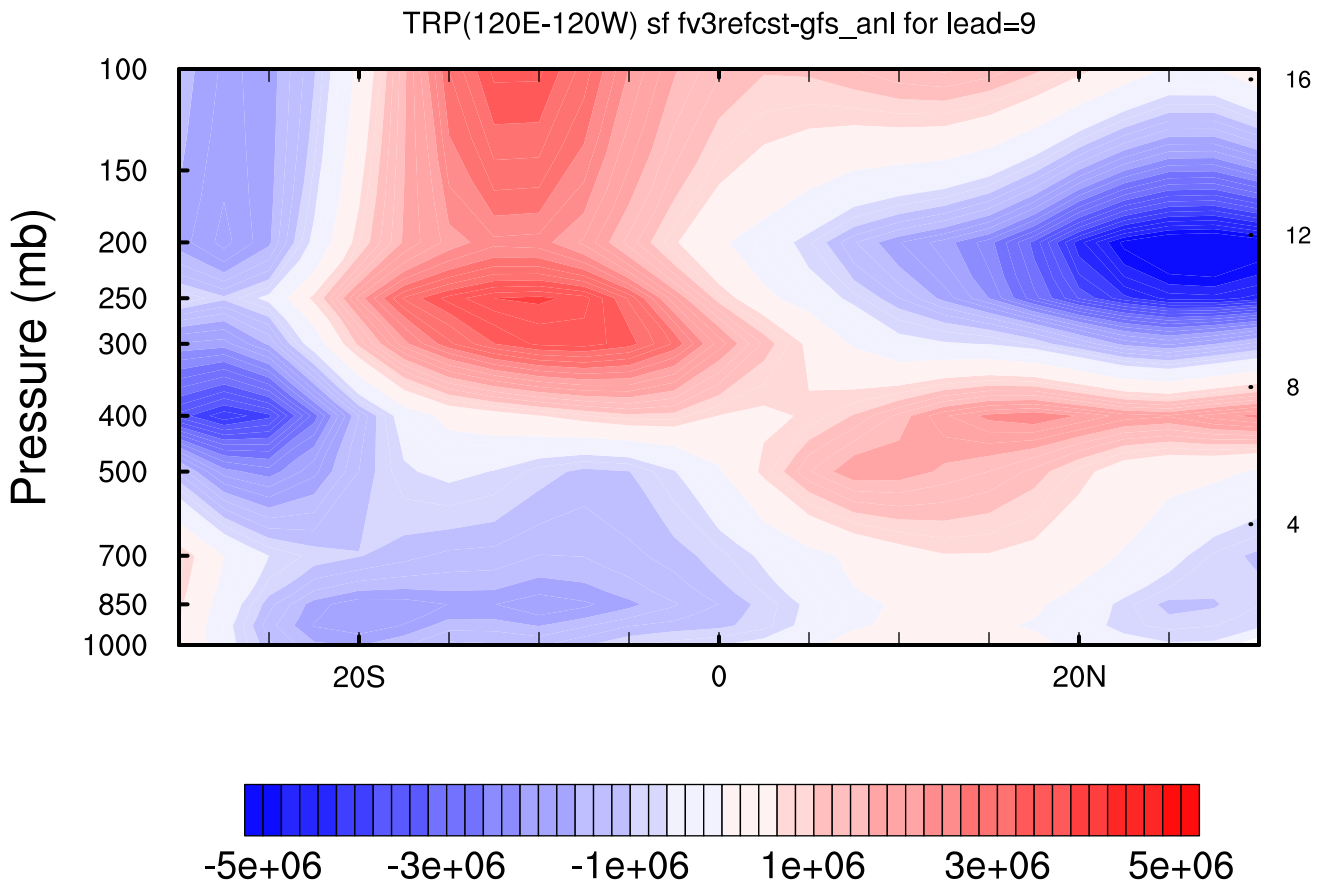

TR(5S-5N) sf fv3refcst-gfs_anl for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

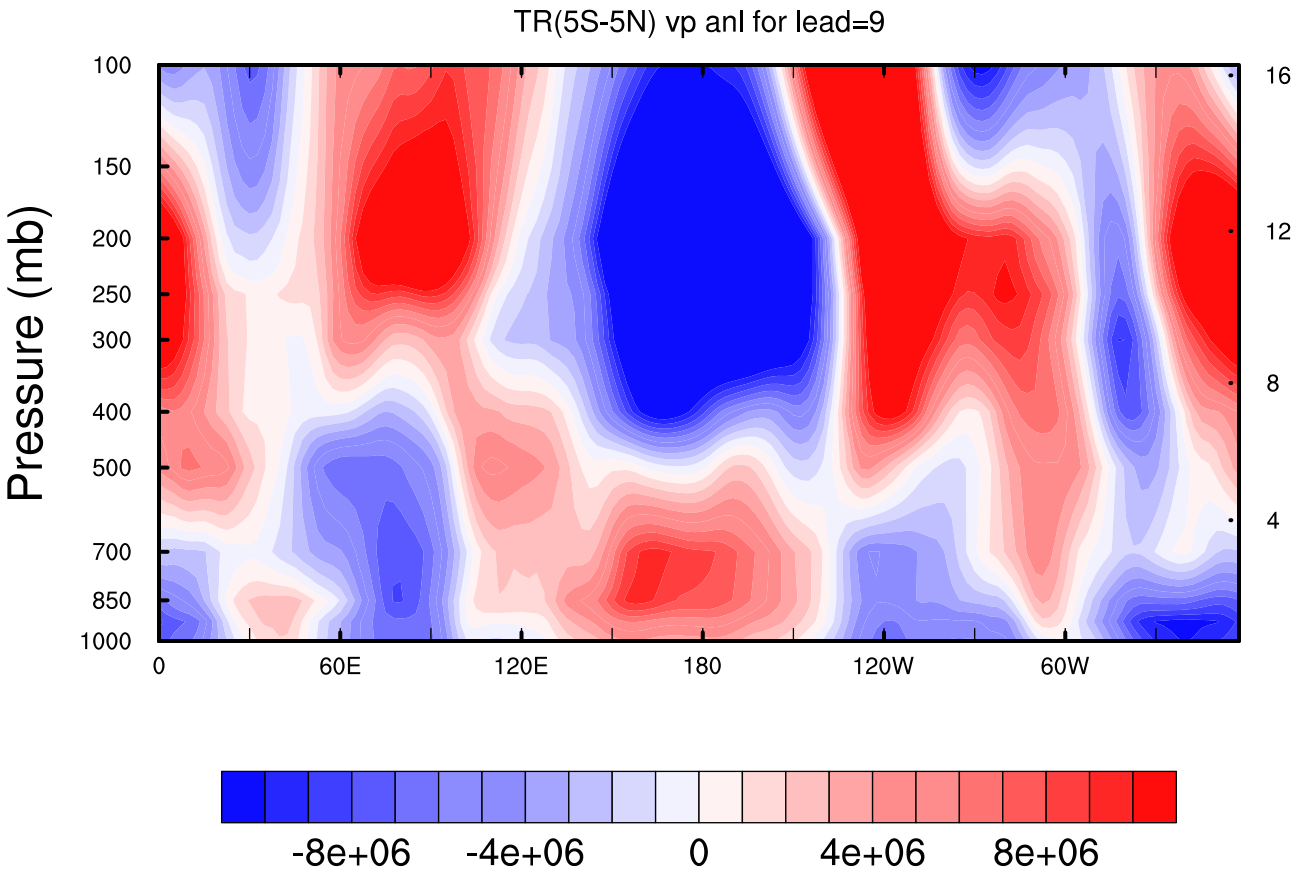

TRP(120E-120W) sf anl for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

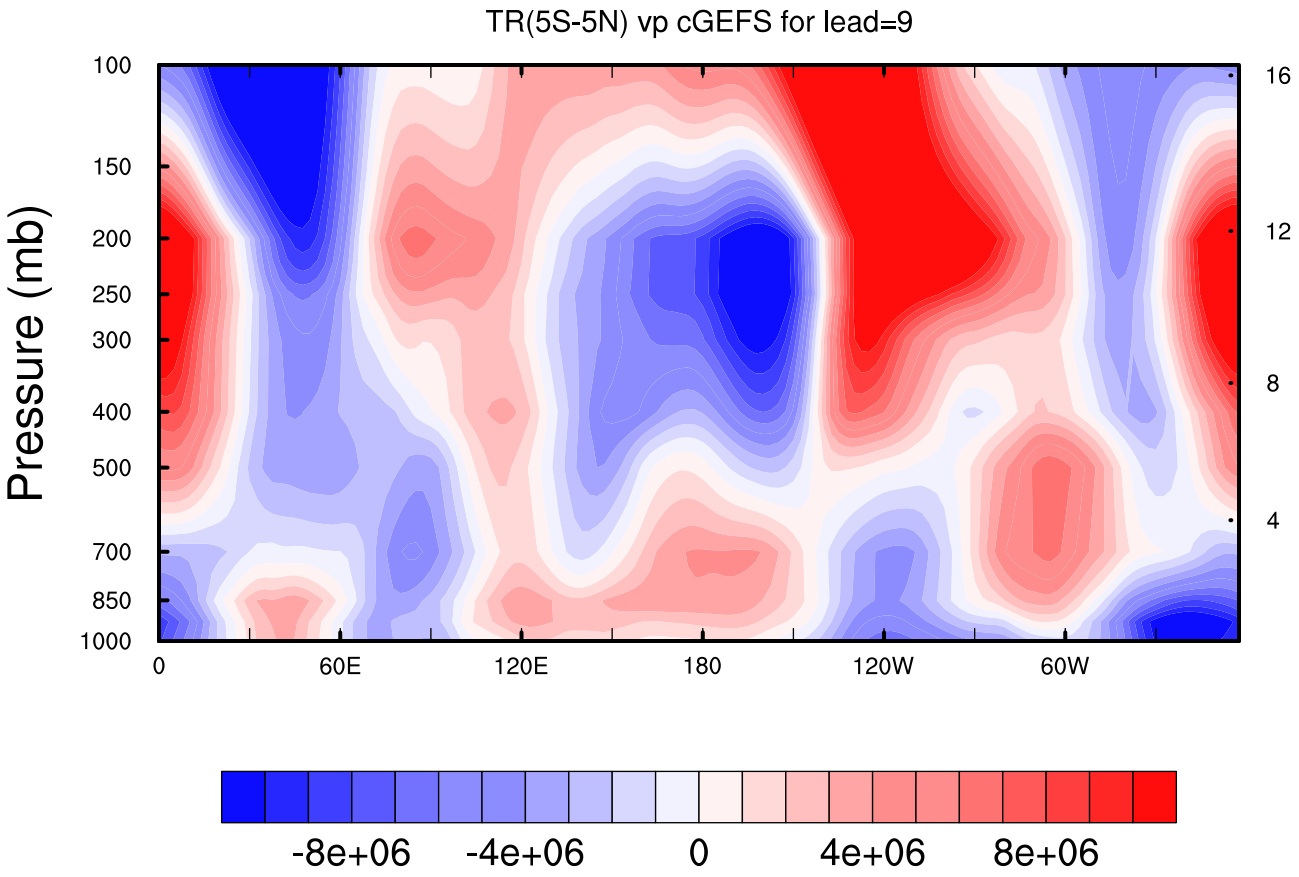

TRP(120E-120W) sf cGEFS for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

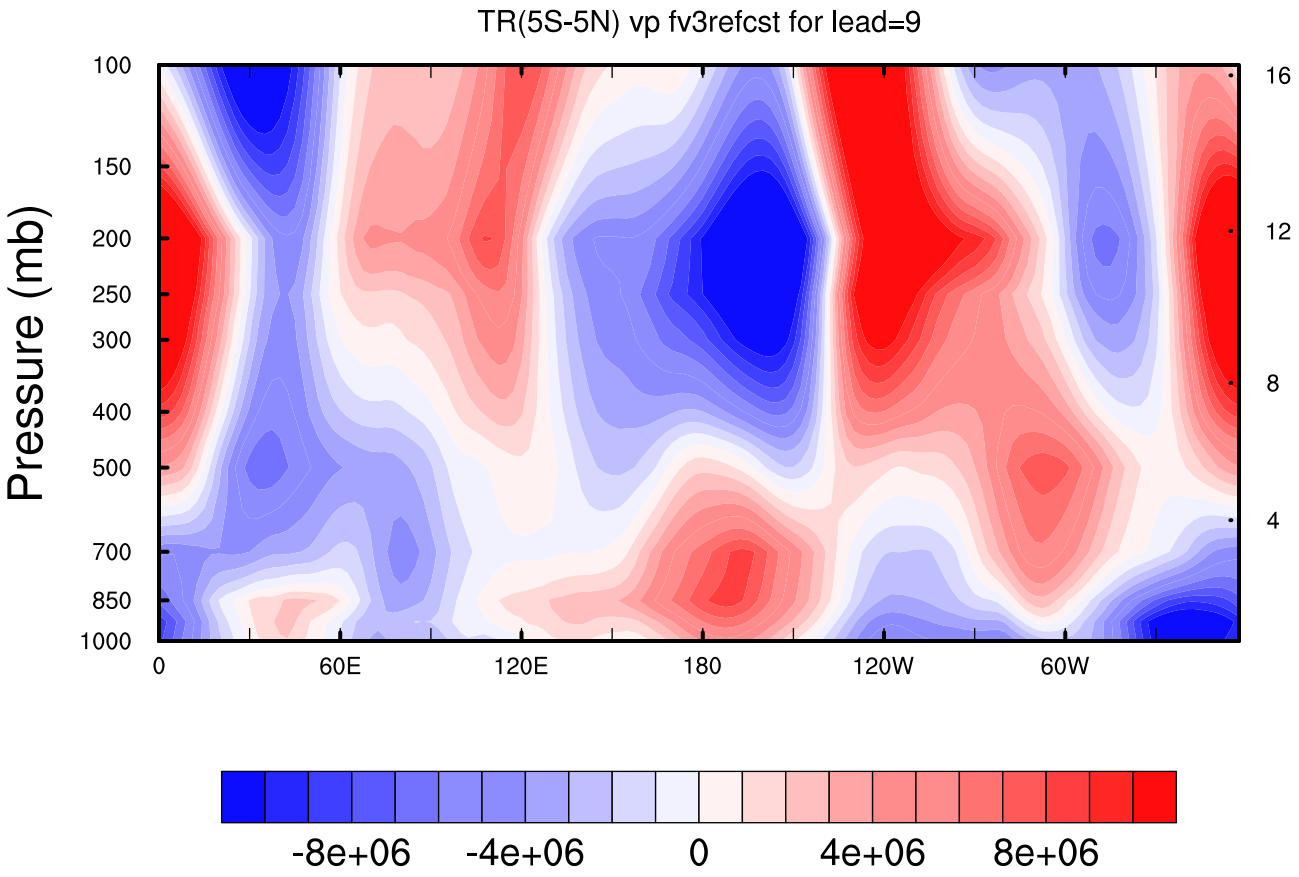

TRP(120E-120W) sf fv3refcst for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

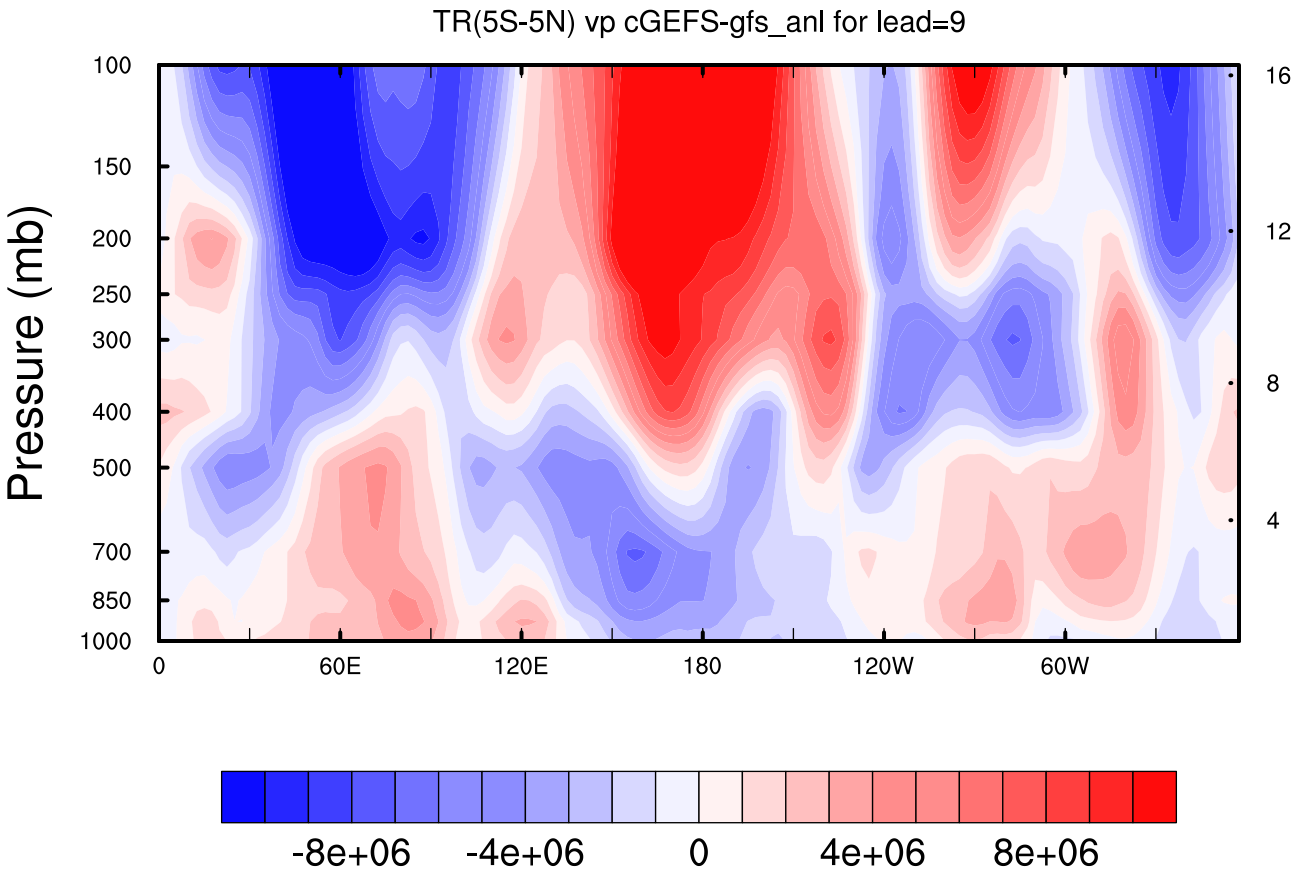

TRP(120E-120W) sf cGEFS-gfs_anl for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

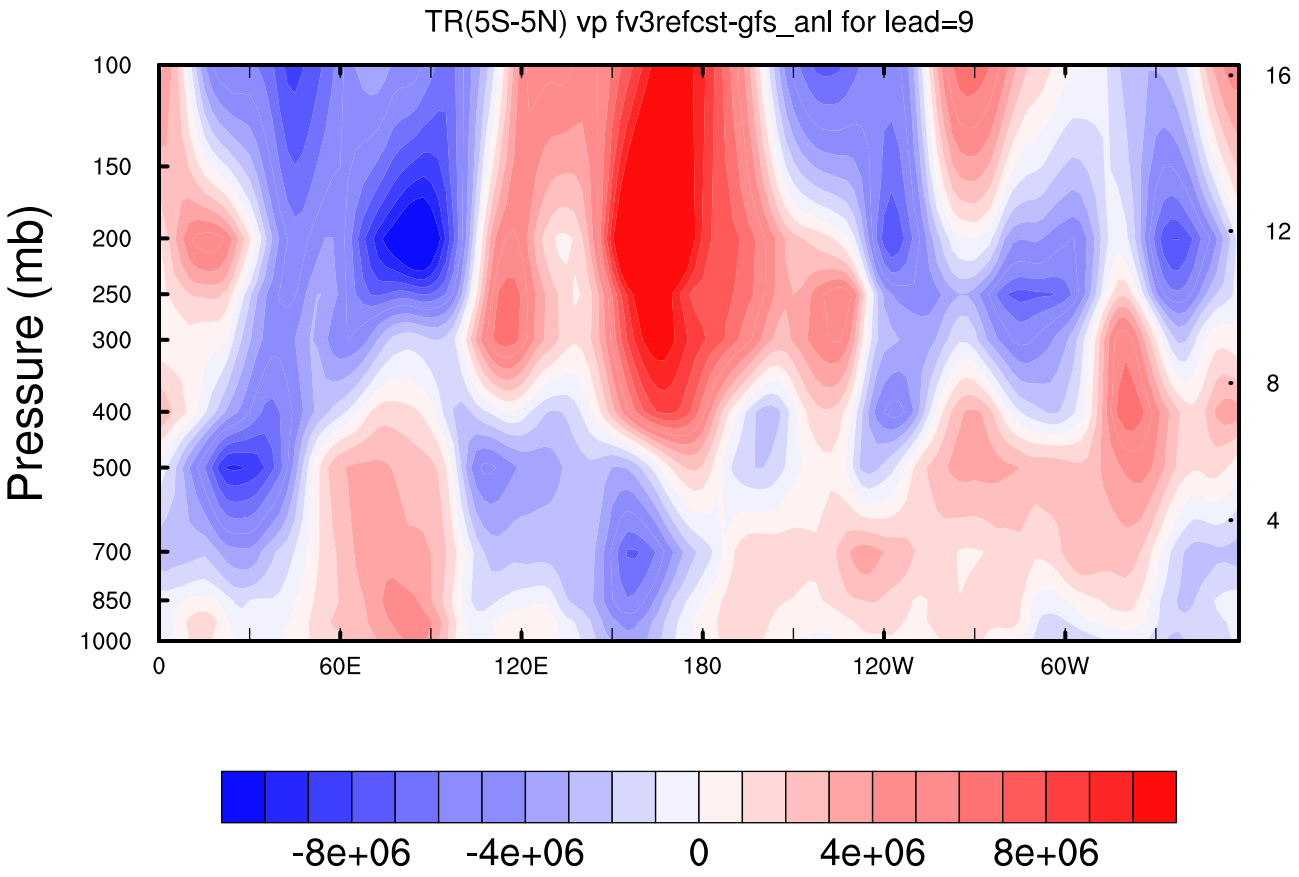

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

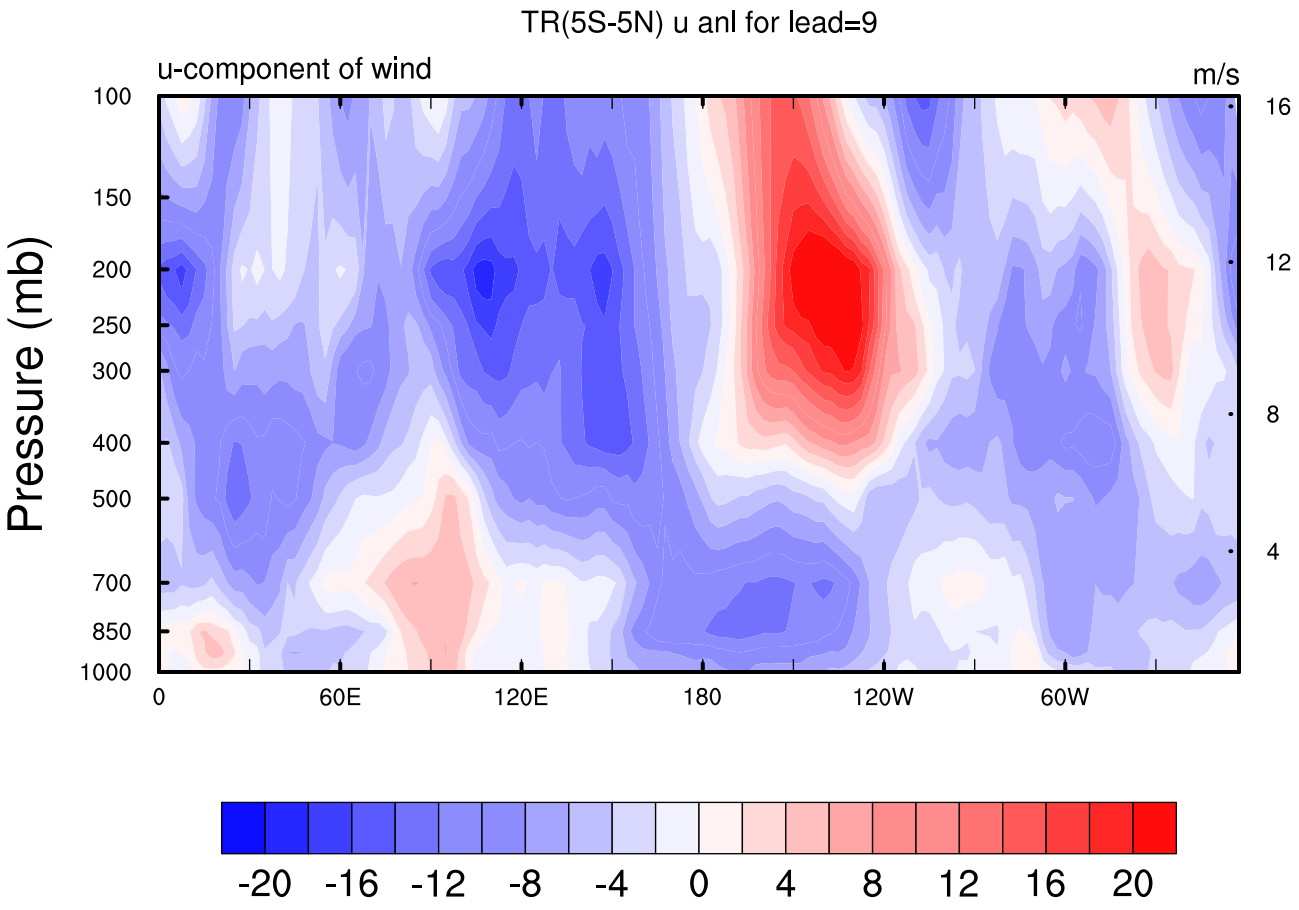

TR(5S-5N) vp anl for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

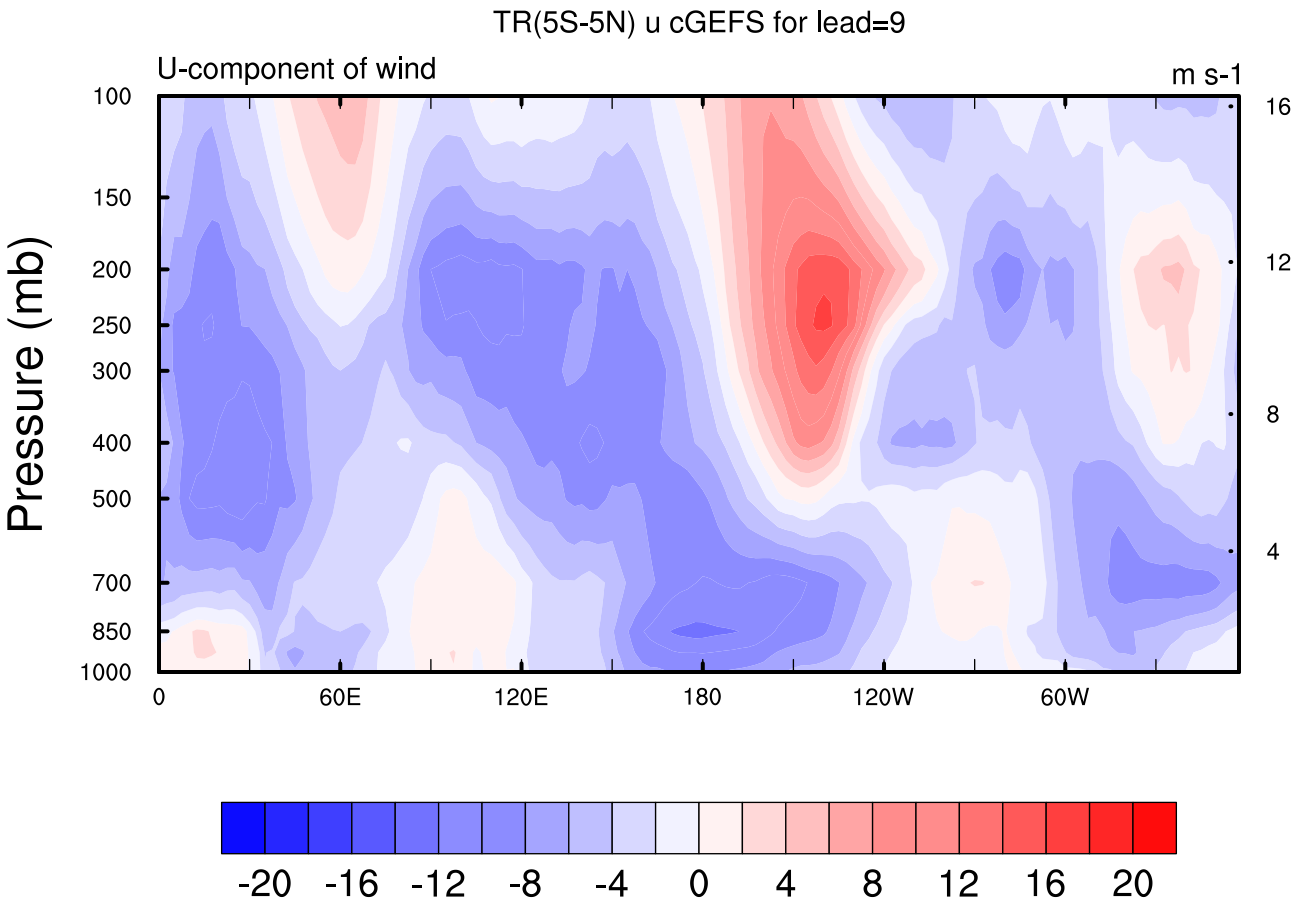

TR(5S-5N) vp cGEFS for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

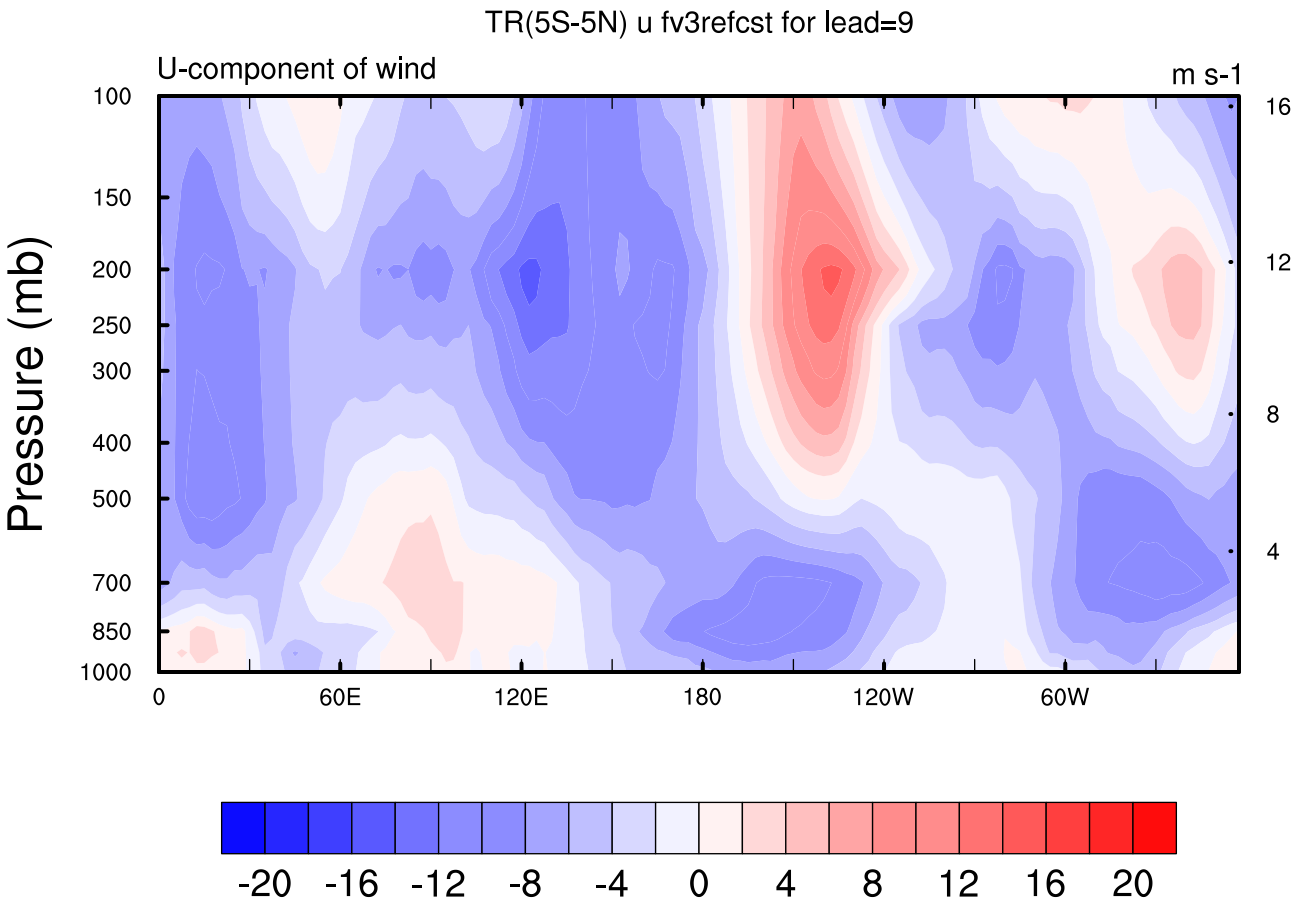

TR(5S-5N) vp fv3refcst for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

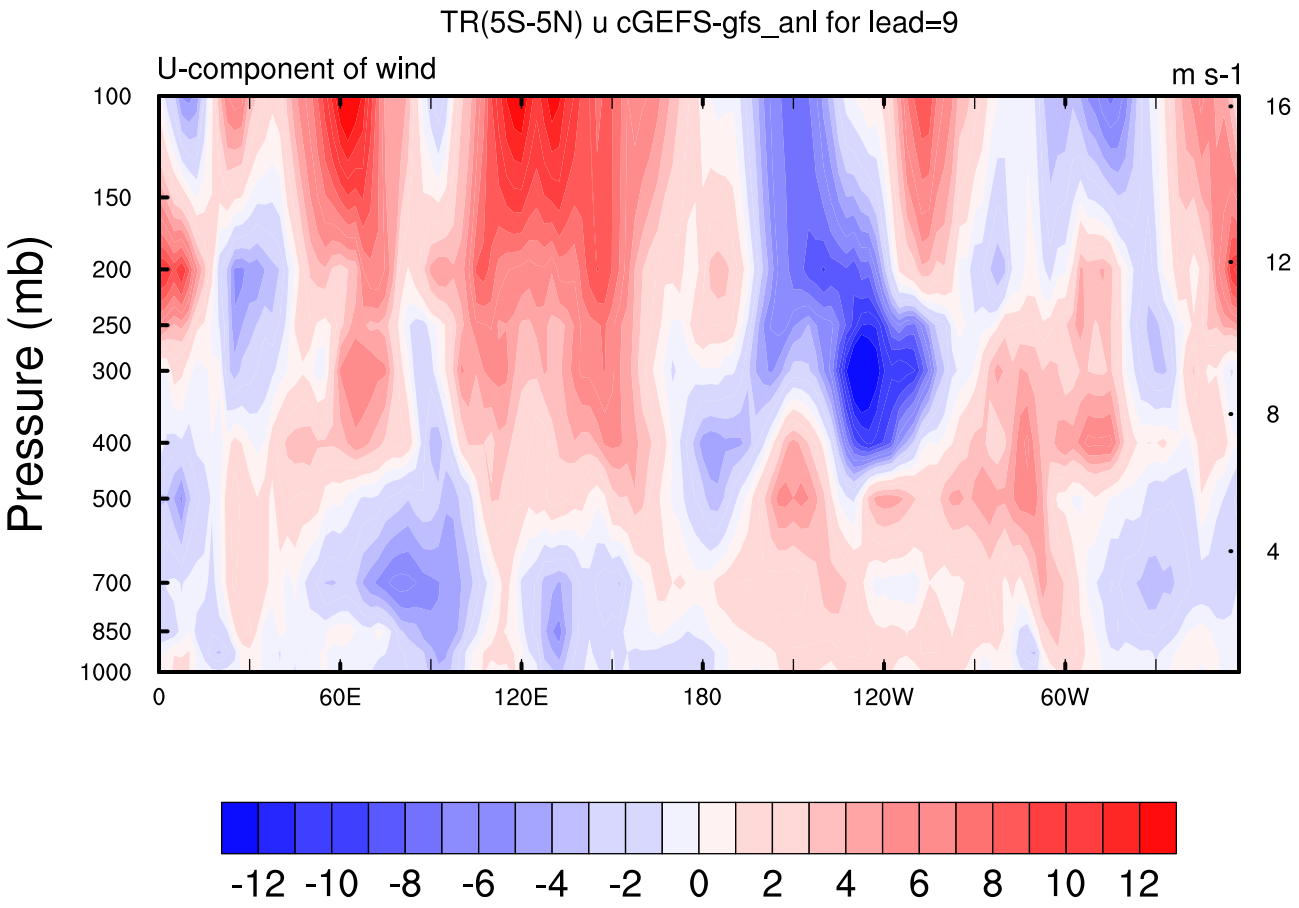

TR(5S-5N) vp cGEFS-gfs_anl for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

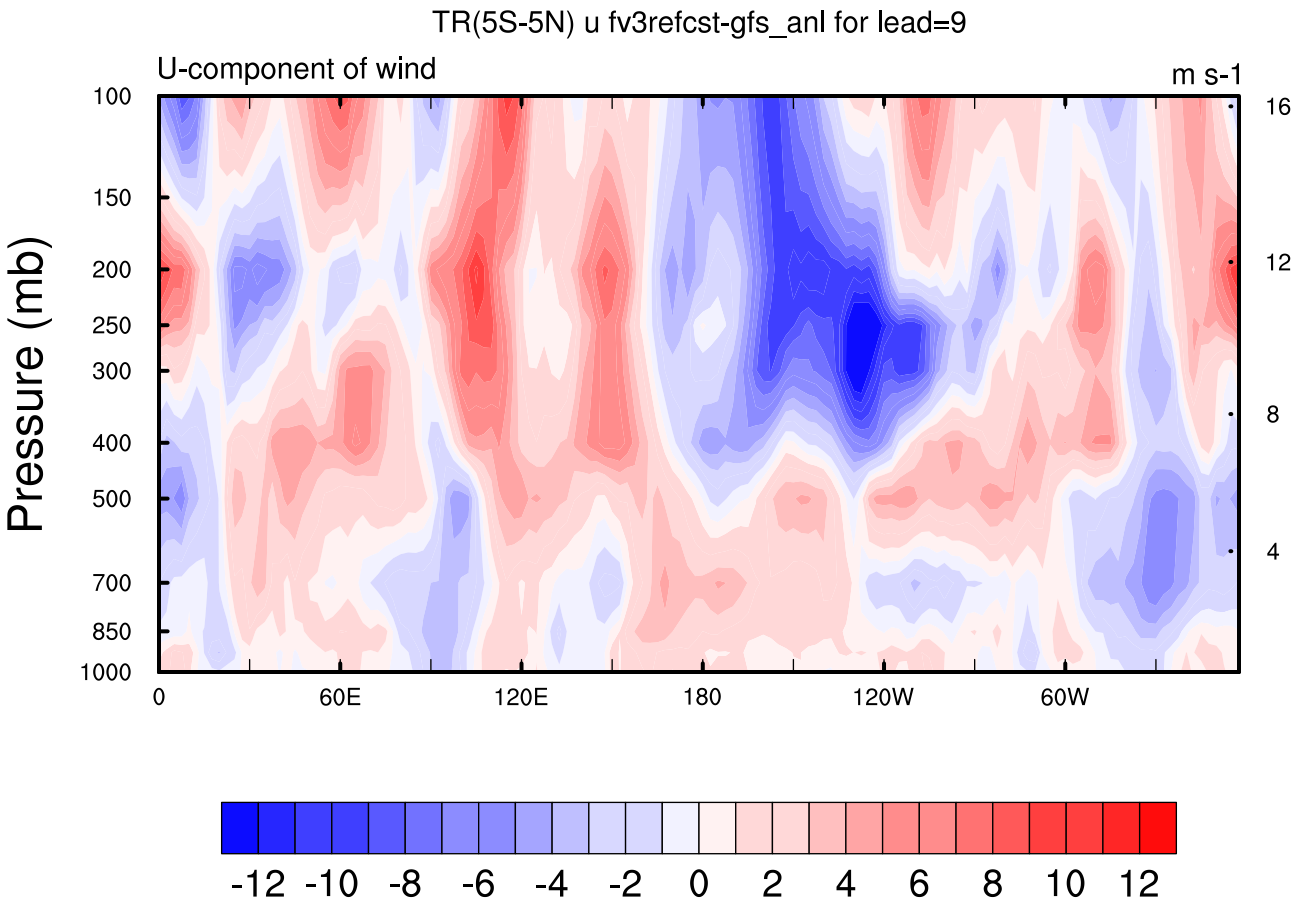

TR(5S-5N) vp fv3refcst-gfs_anl for lead=9
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

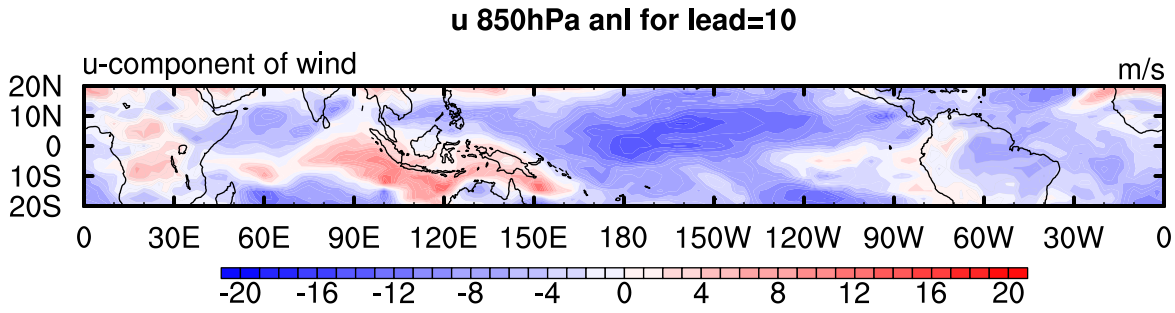

TR(5S-5N) u anl for lead=9
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

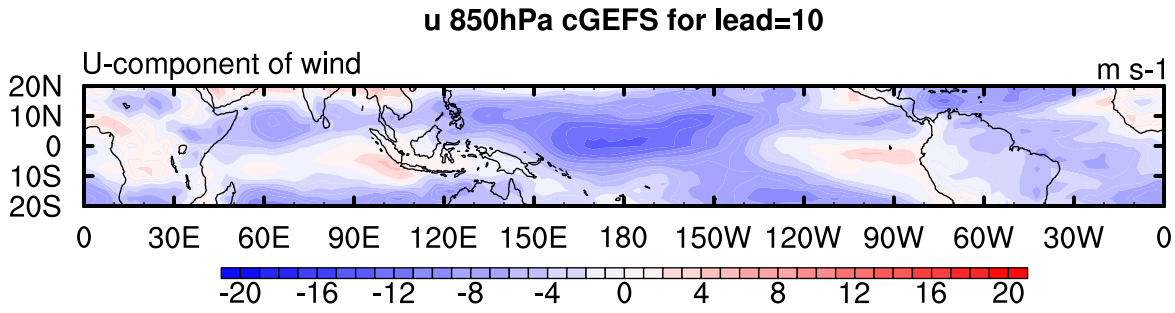

TR(5S-5N) u cGEFS for lead=9
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

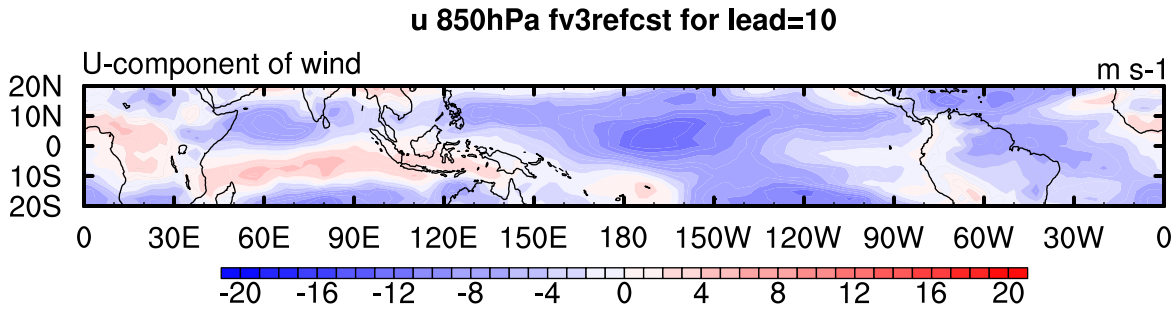

TR(5S-5N) u fv3refcst for lead=9
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

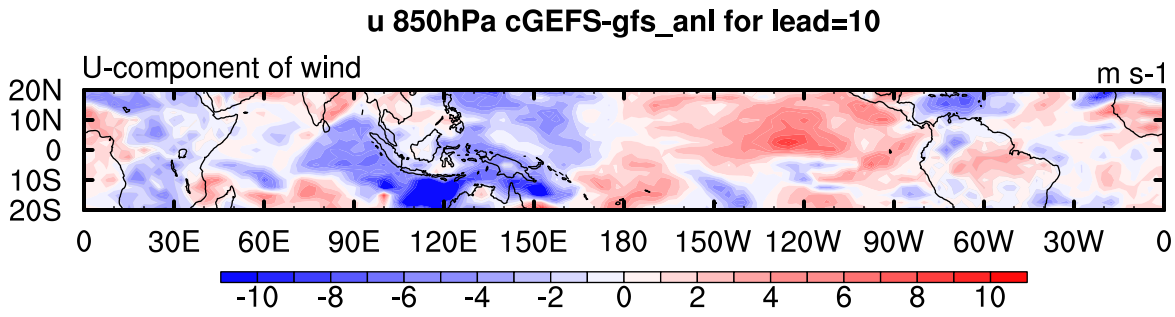

TR(5S-5N) u cGEFS-gfs_anl for lead=9
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

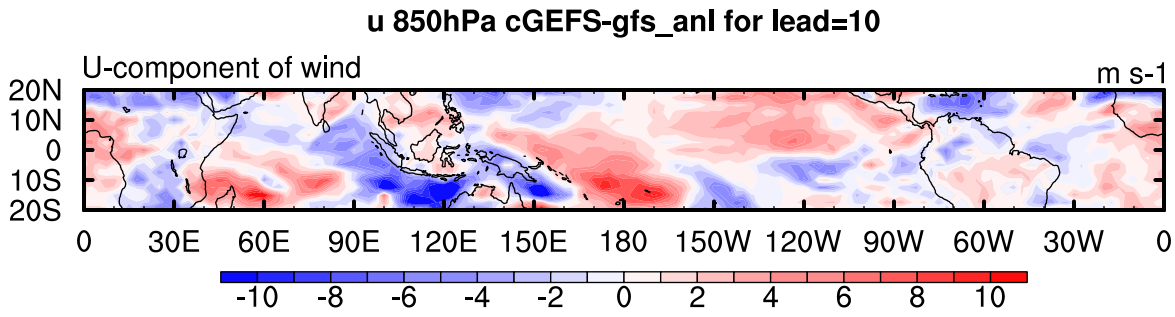

TR(5S-5N) u fv3refcst-gfs_anl for lead=9
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

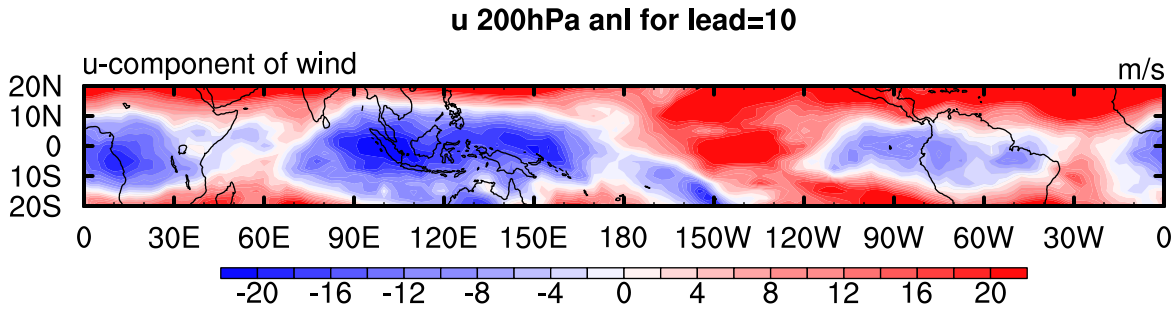

u 850hPa anl for lead=10
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

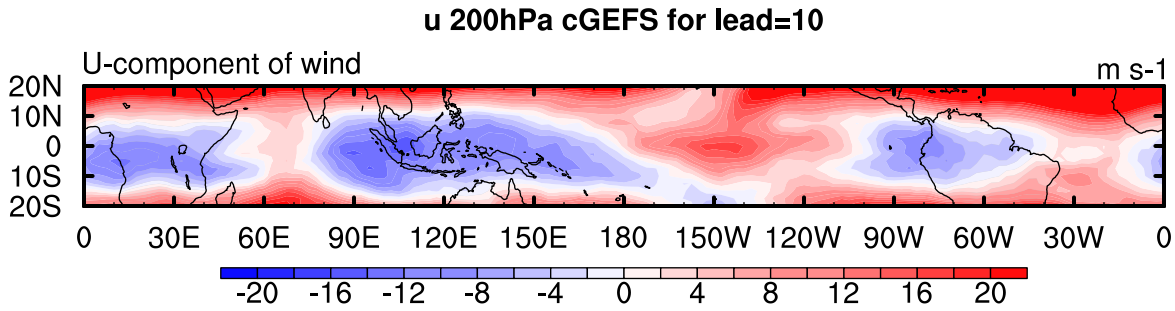

u 850hPa cGEFS for lead=10
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

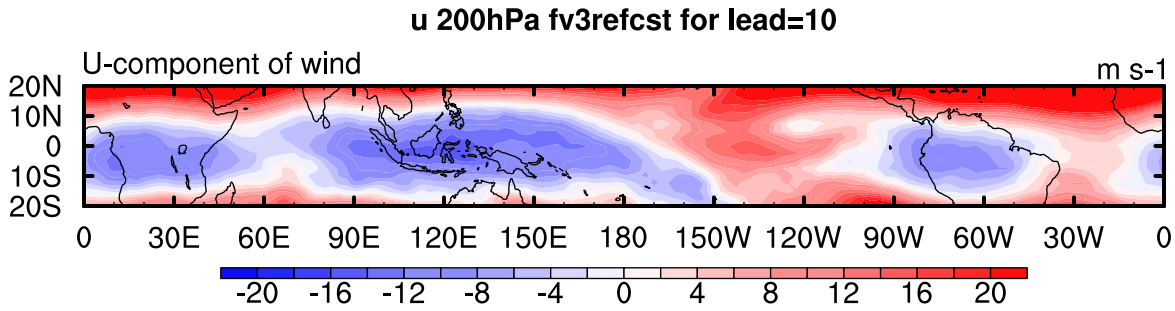

u 850hPa fv3refcst for lead=10
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

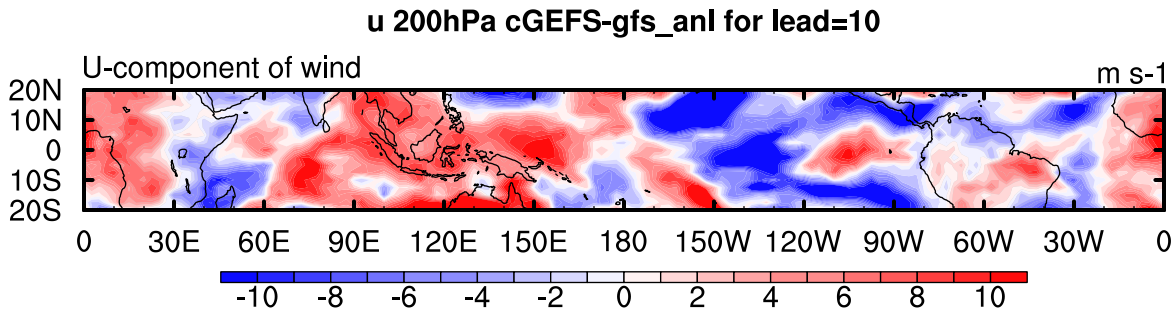

u 850hPa cGEFS-gfs_anl for lead=10
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

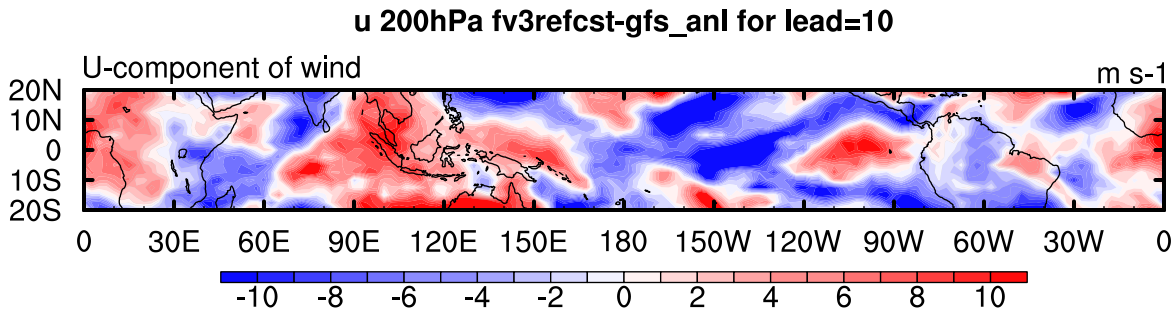

u 850hPa cGEFS-gfs_anl for lead=10
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

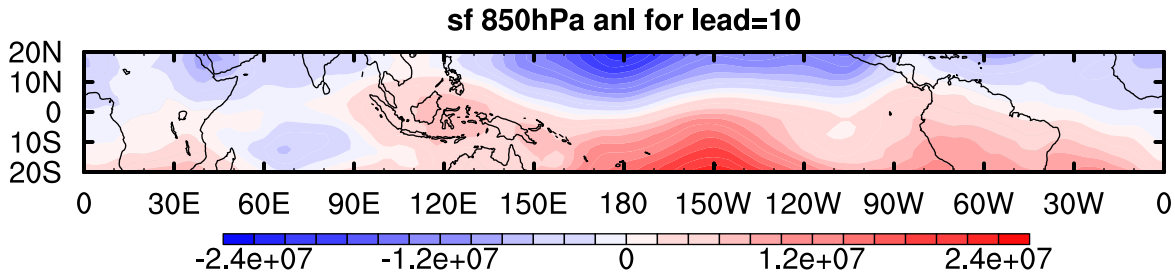

u 200hPa anl for lead=10
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

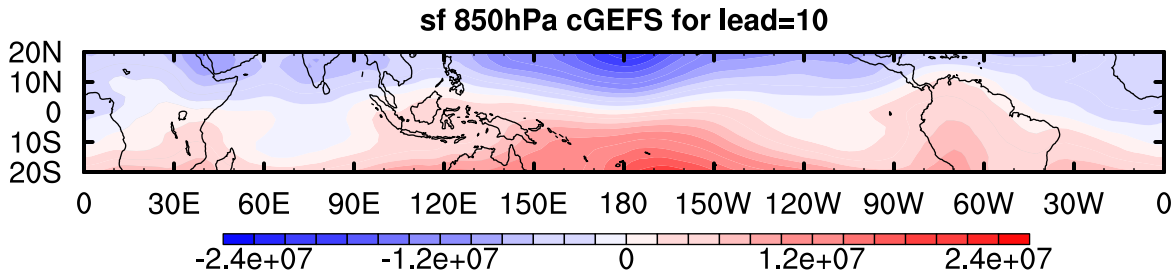

u 200hPa cGEFS for lead=10
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

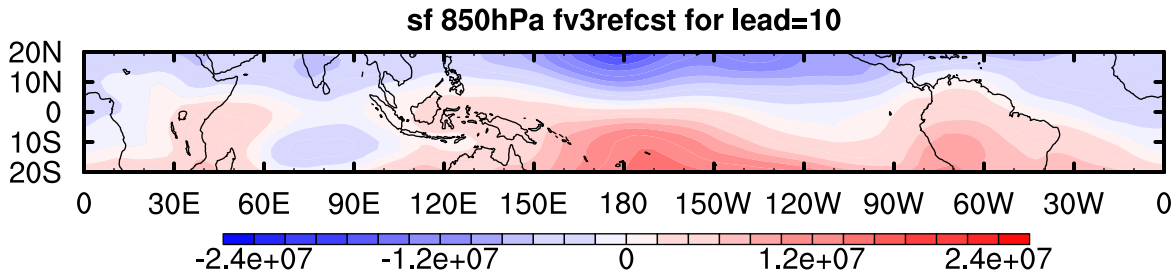

u 200hPa fv3refcst for lead=10
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=10
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=10
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


sf 850hPa anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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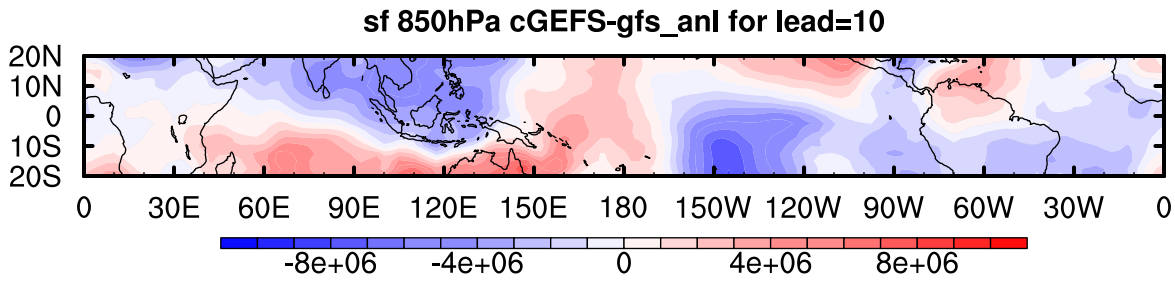
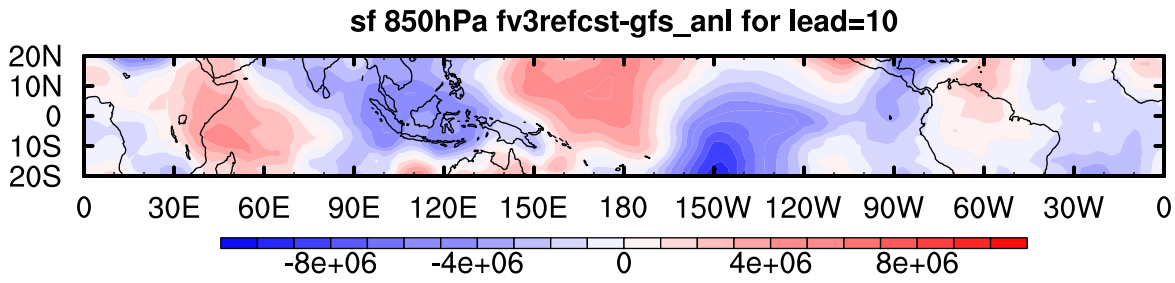
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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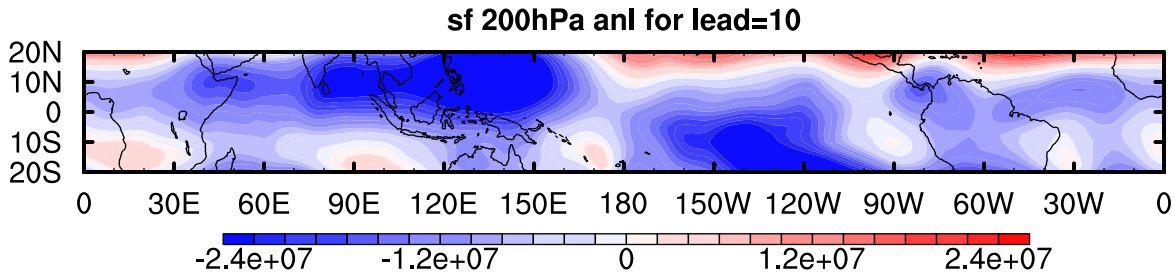
-4e+06
0
4e+06
8e+06


sf 200hPa anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-2.4e+07
-1.2e+07
0
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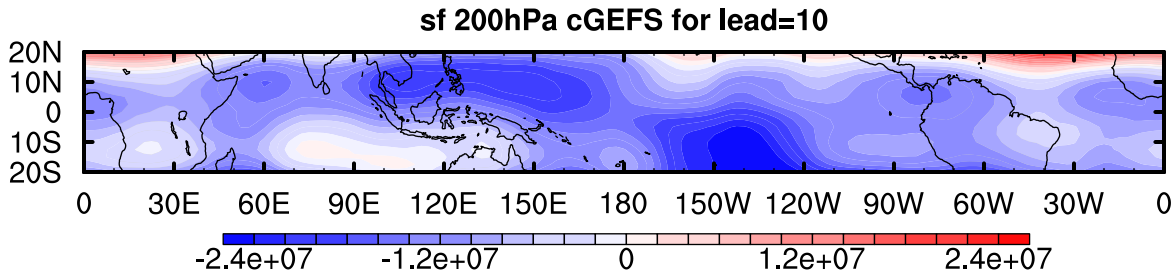
2.4e+07


sf 200hPa cGEFS for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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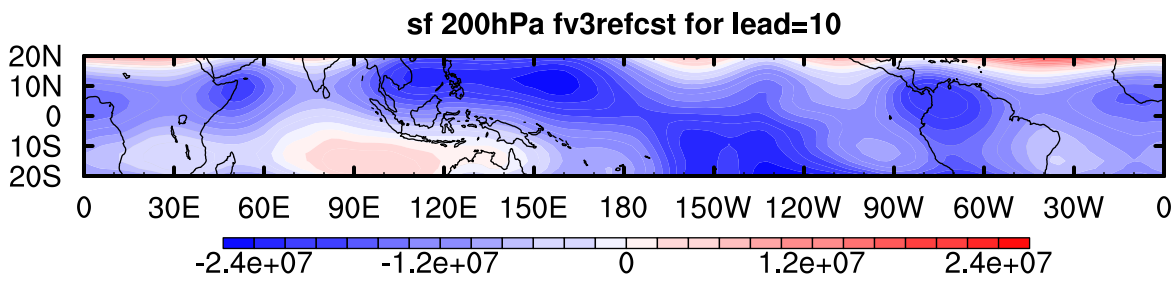
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
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30W
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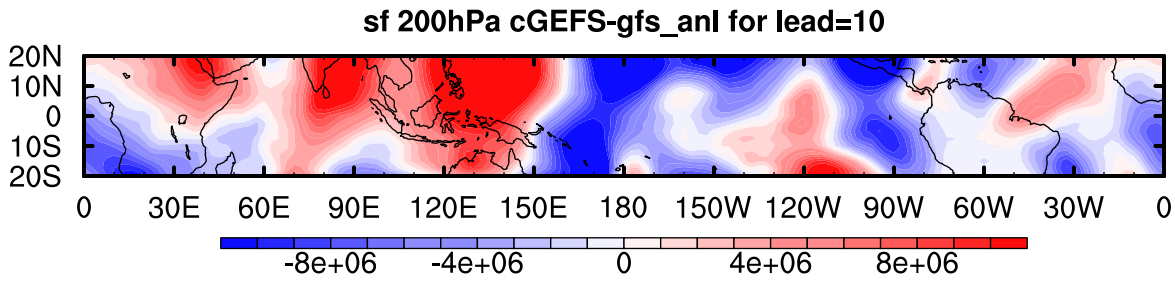
0
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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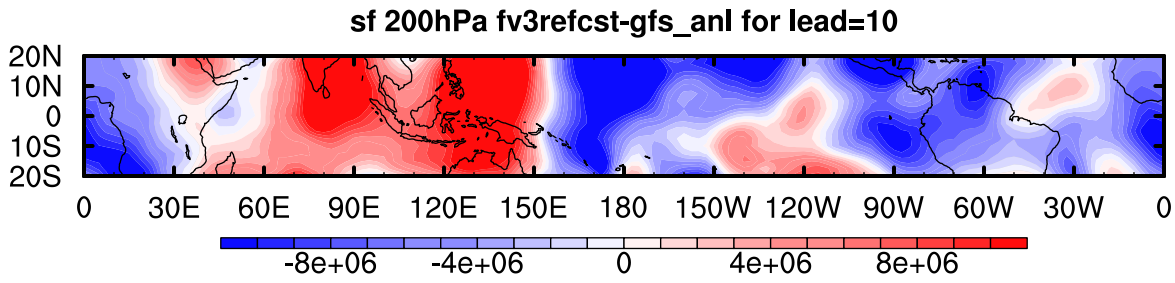
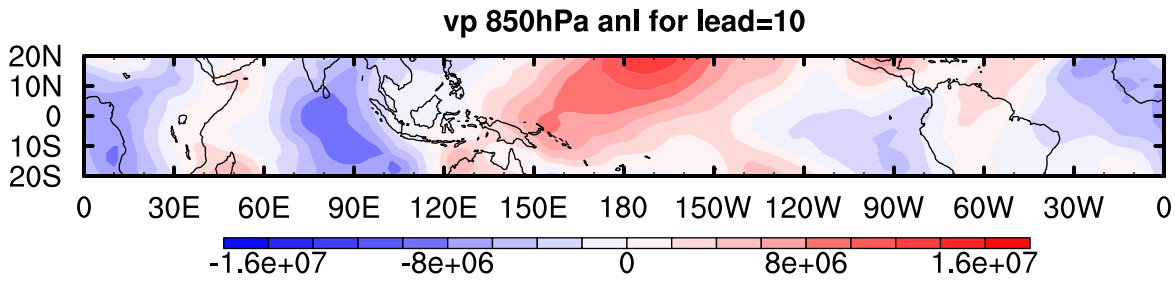
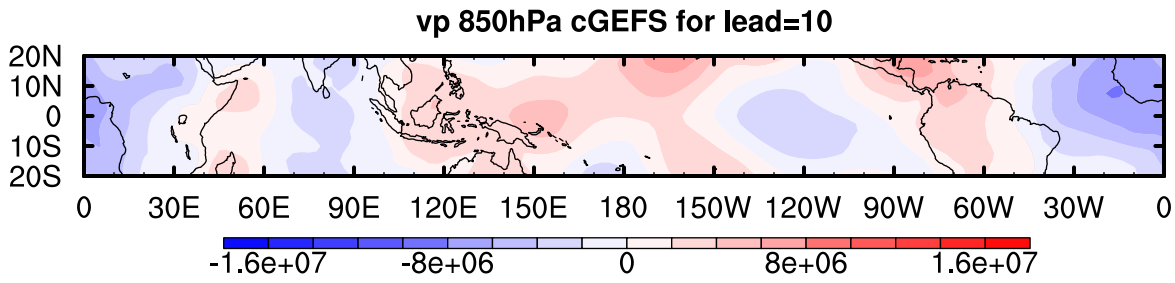
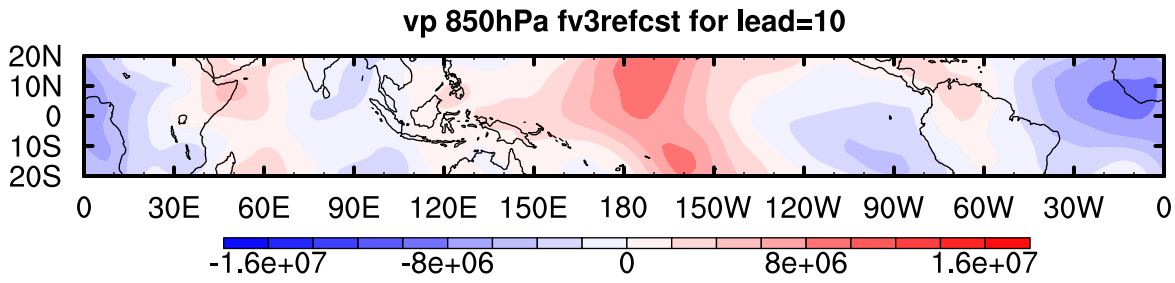
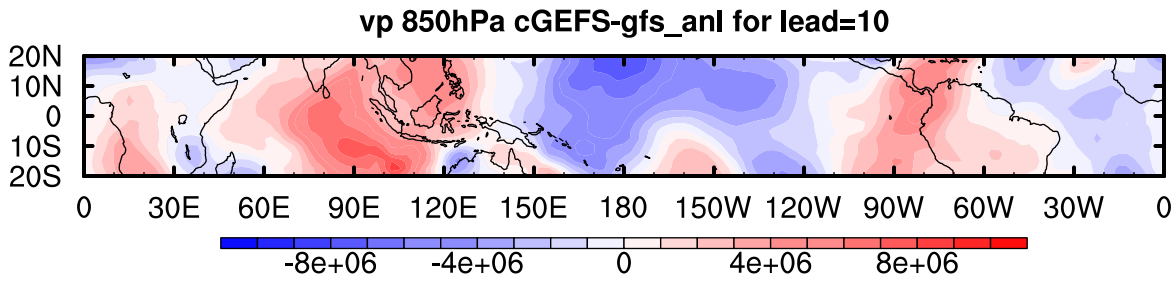
-4e+06
0
4e+06
8e+06

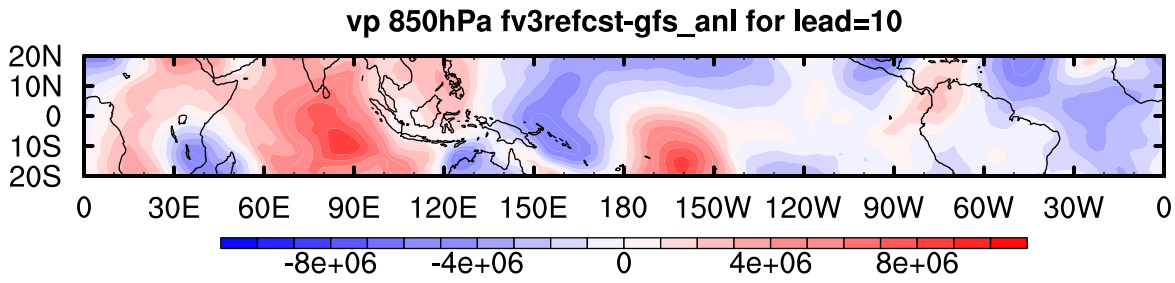

sf 200hPa fv3refcst-gfs_anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

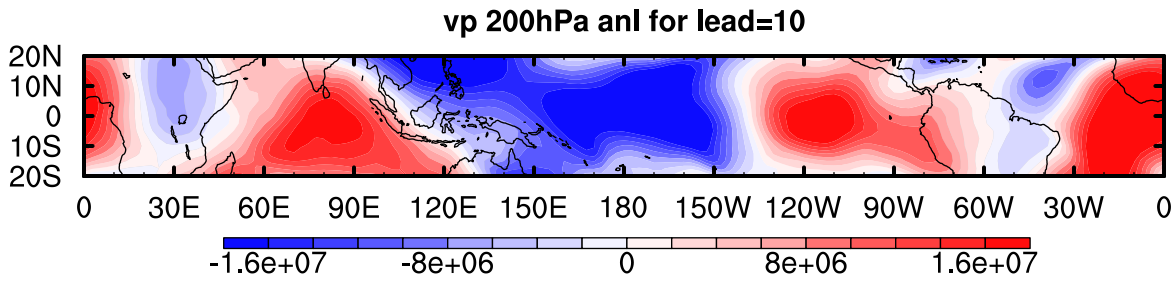

vp 850hPa anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

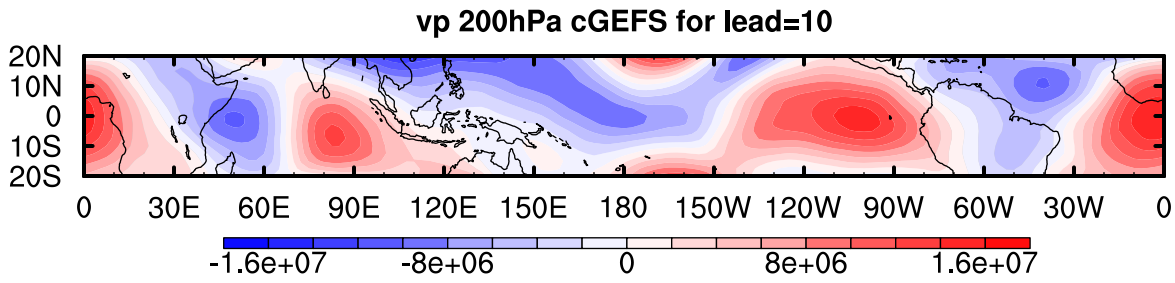

vp 850hPa cGEFS for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

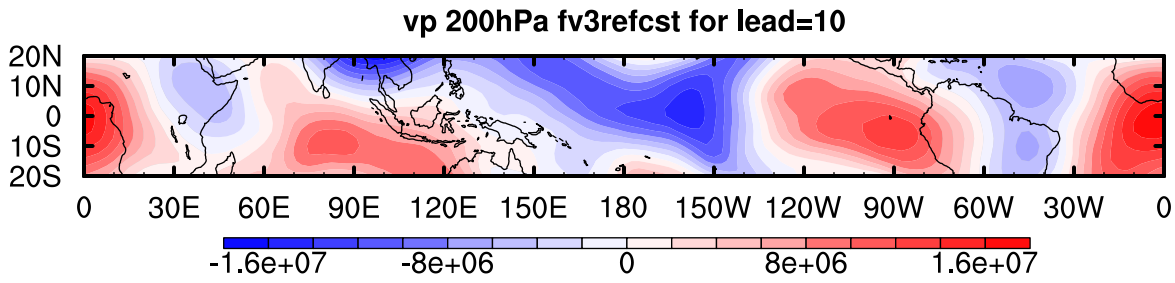

vp 850hPa fv3refcst for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

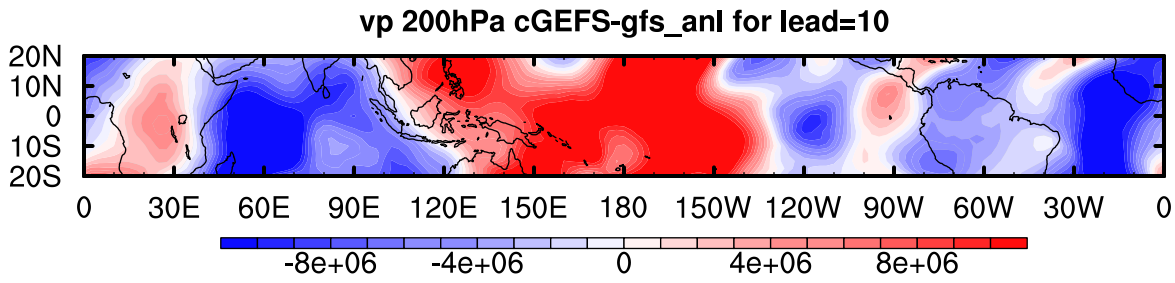

vp 850hPa cGEFS-gfs_anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

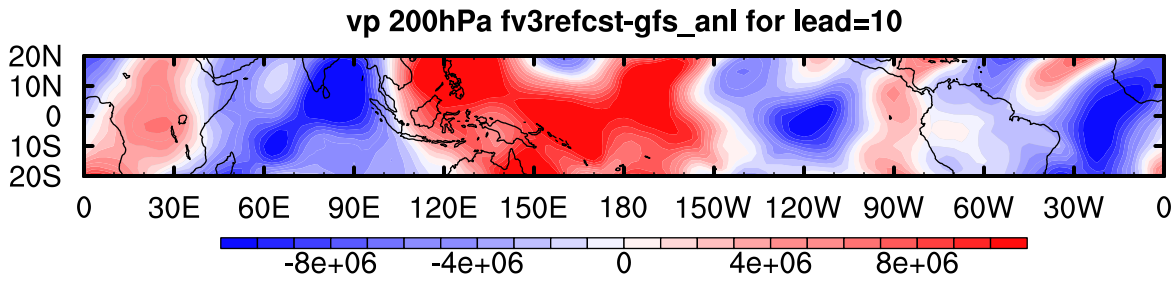

vp 850hPa fv3refcst-gfs_anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

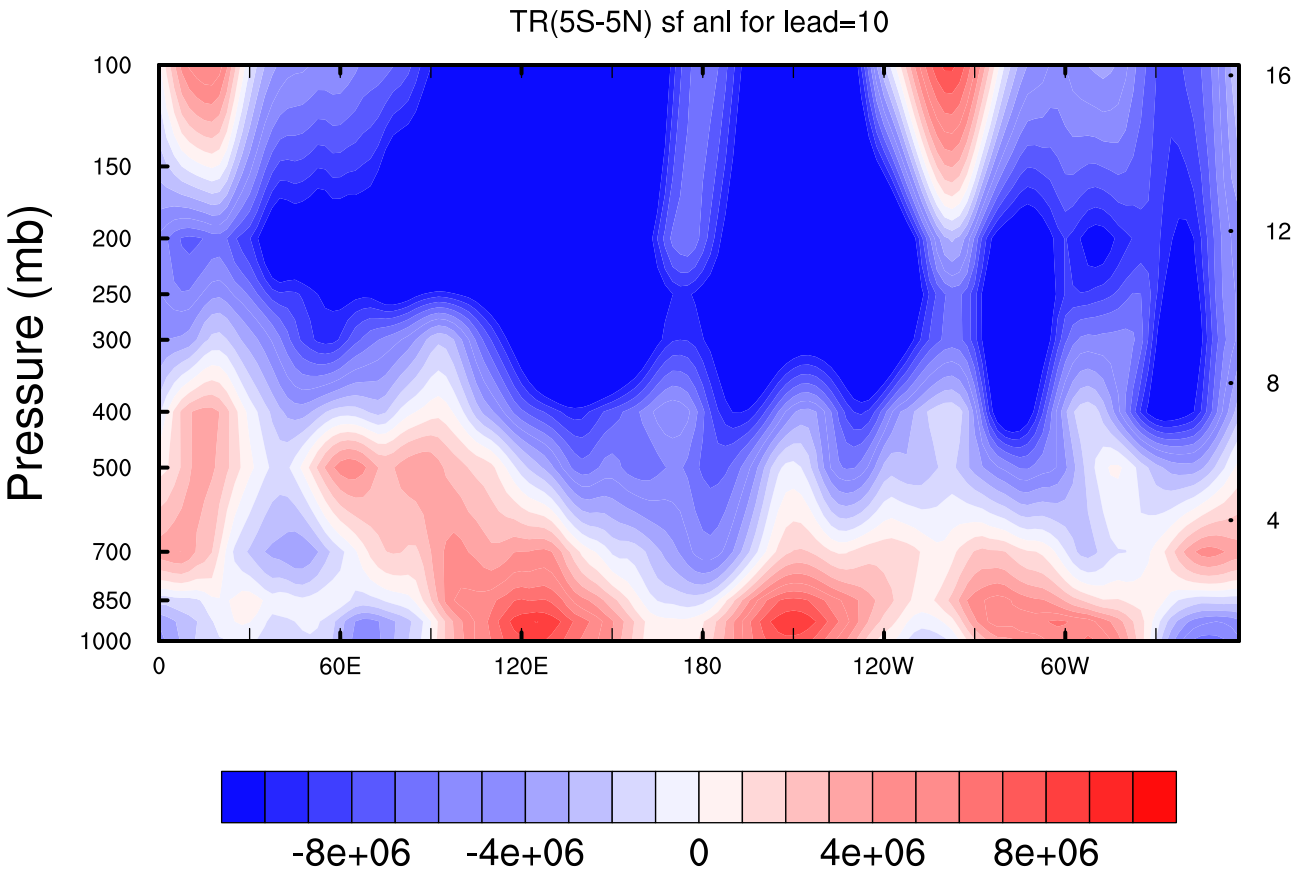

vp 200hPa anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

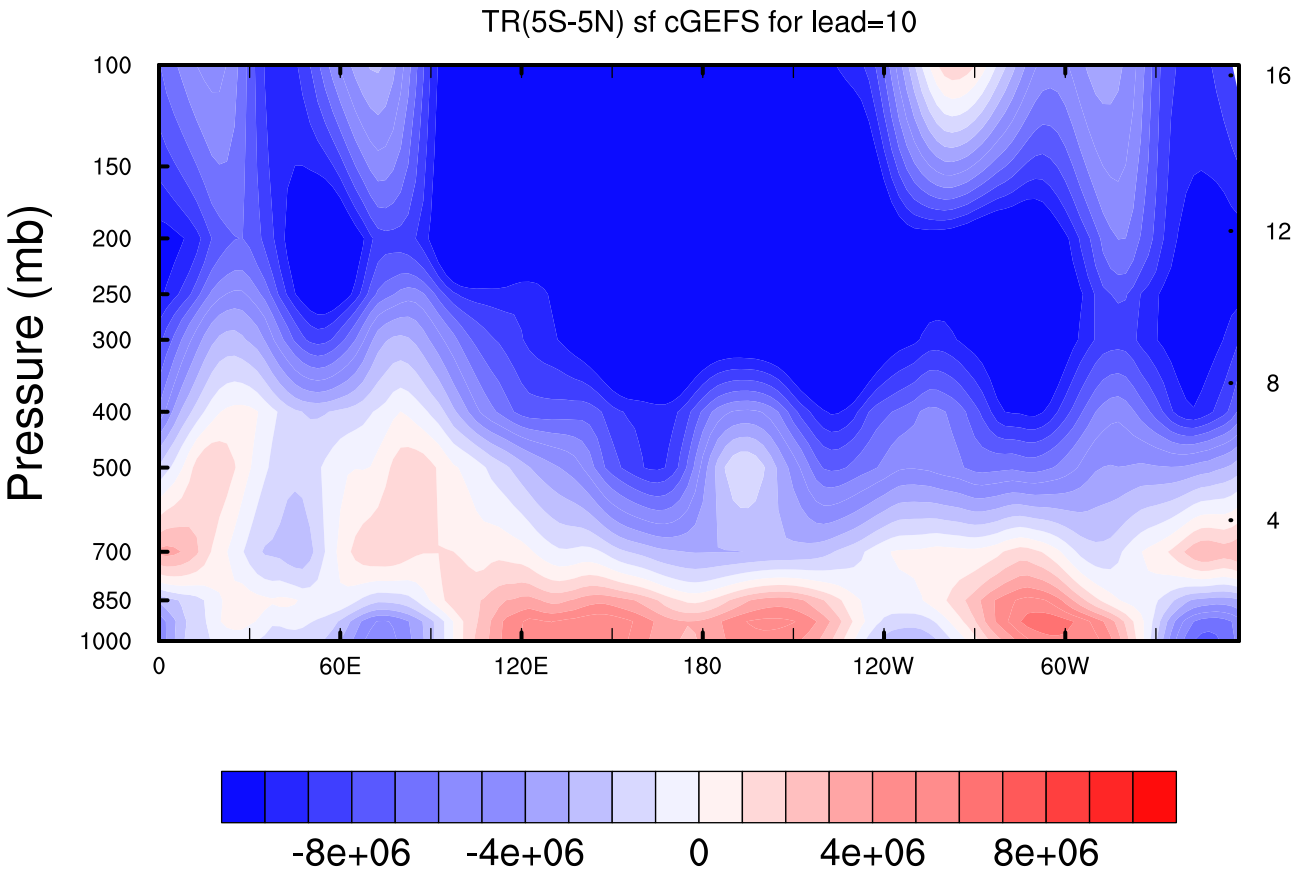

vp 200hPa cGEFS for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

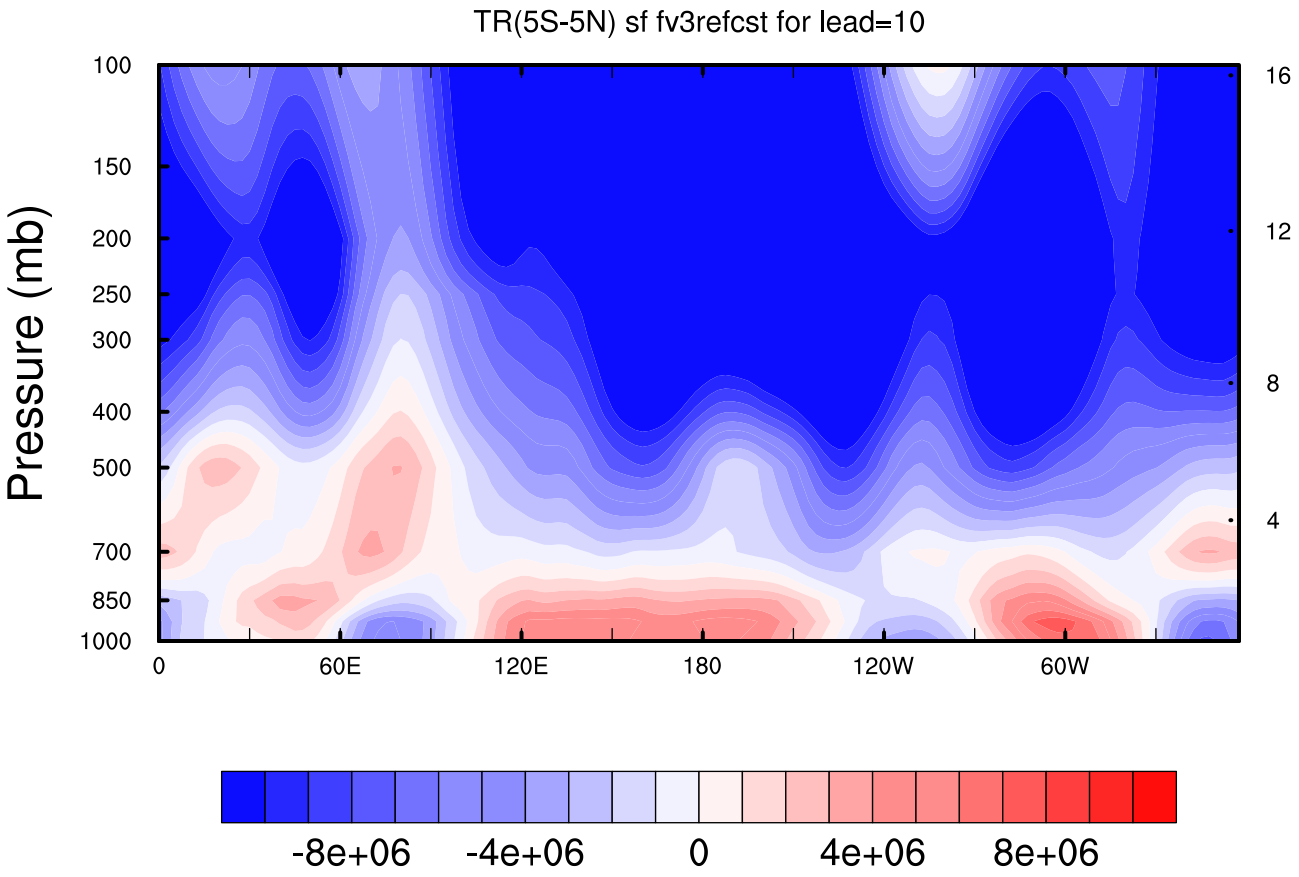

vp 200hPa fv3refcst for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

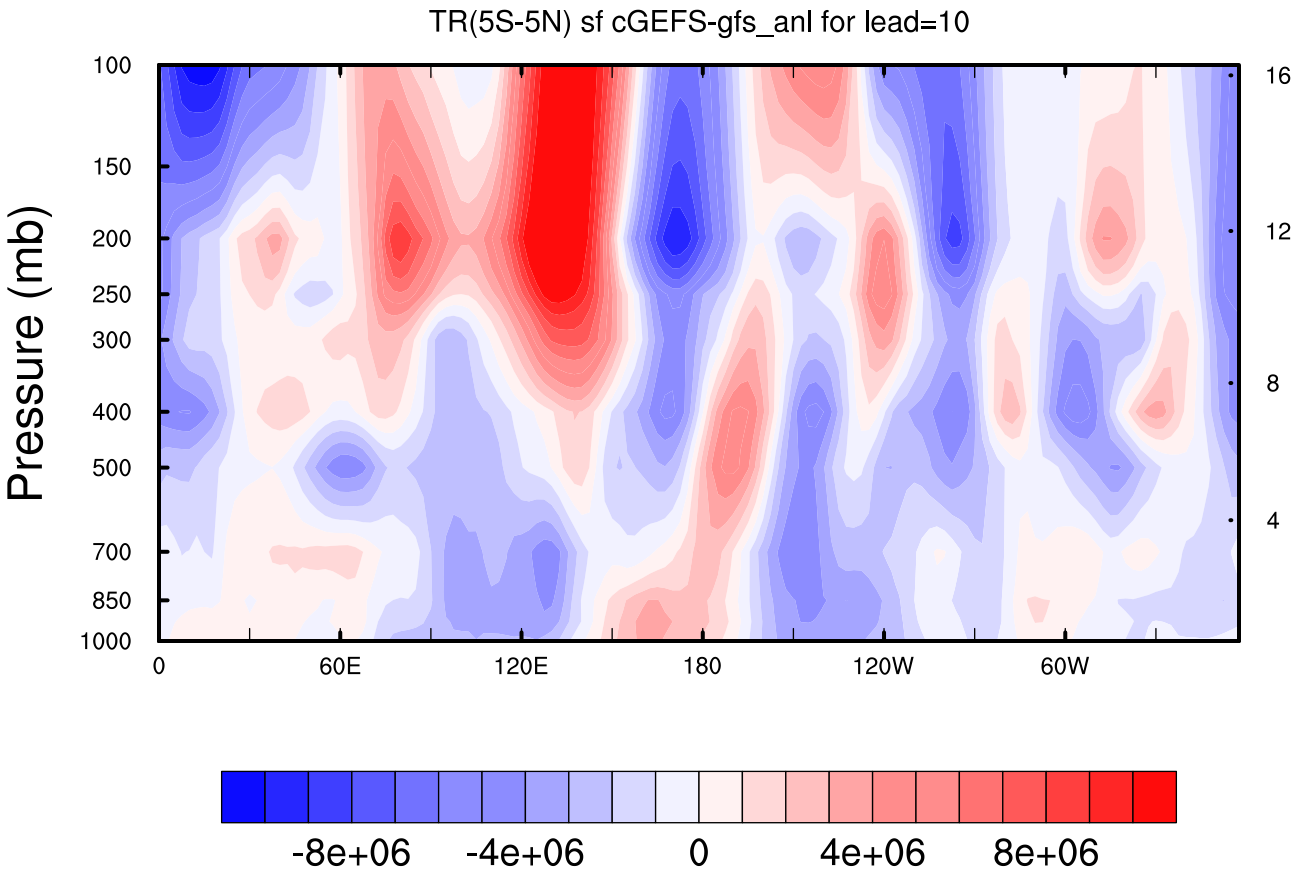

vp 200hPa cGEFS-gfs_anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

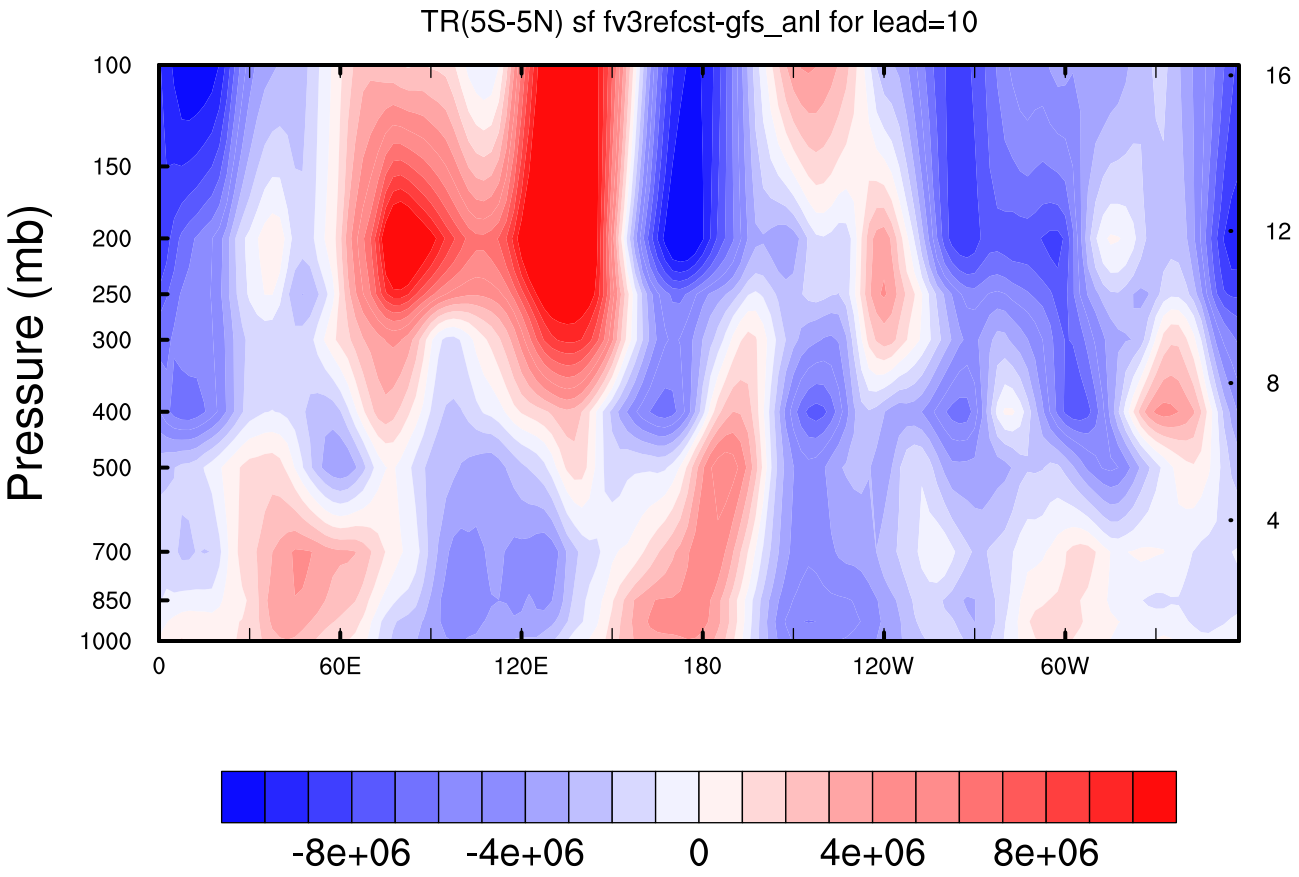

vp 200hPa fv3refcst-gfs_anl for lead=10
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

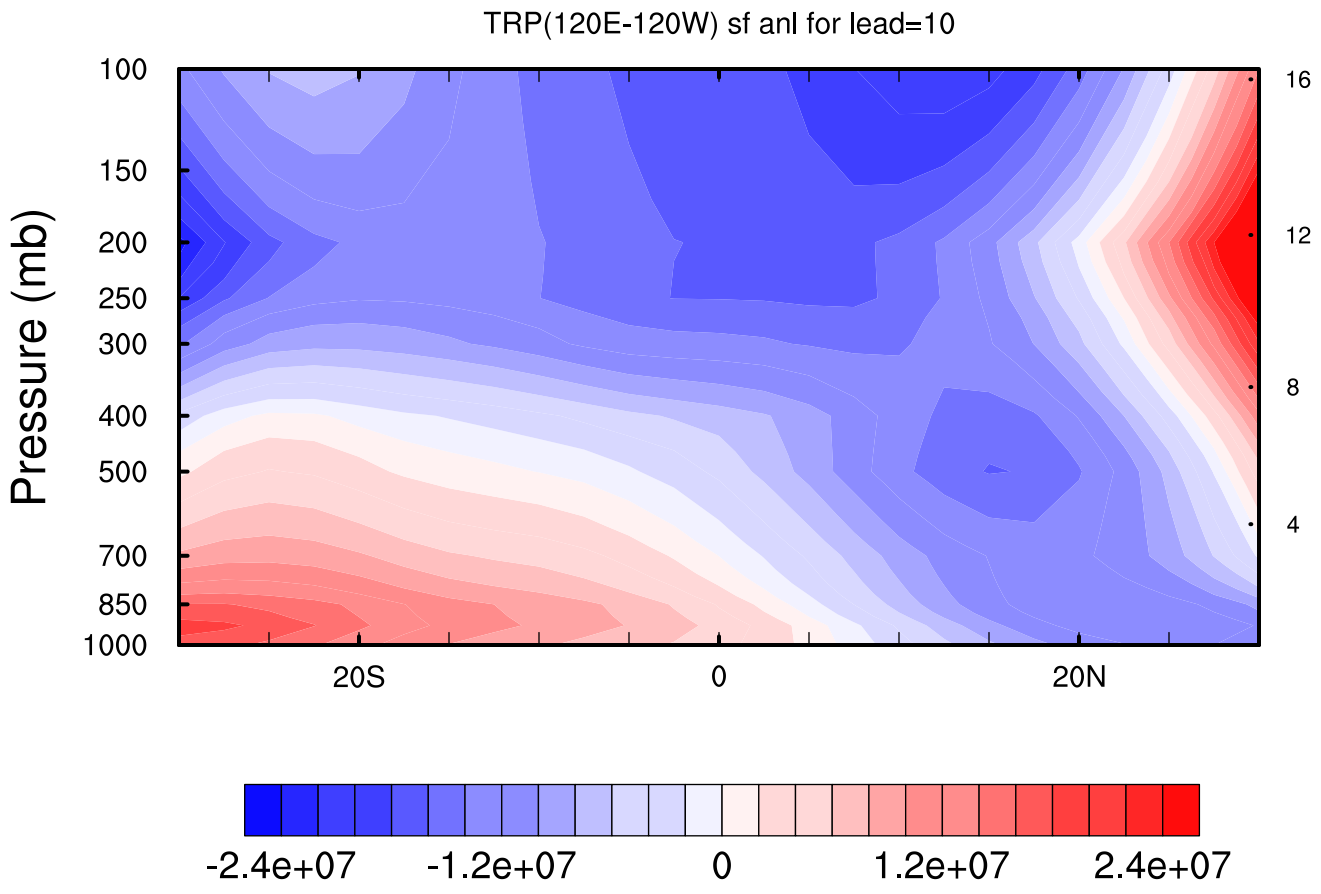

TR(5S-5N) sf anl for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

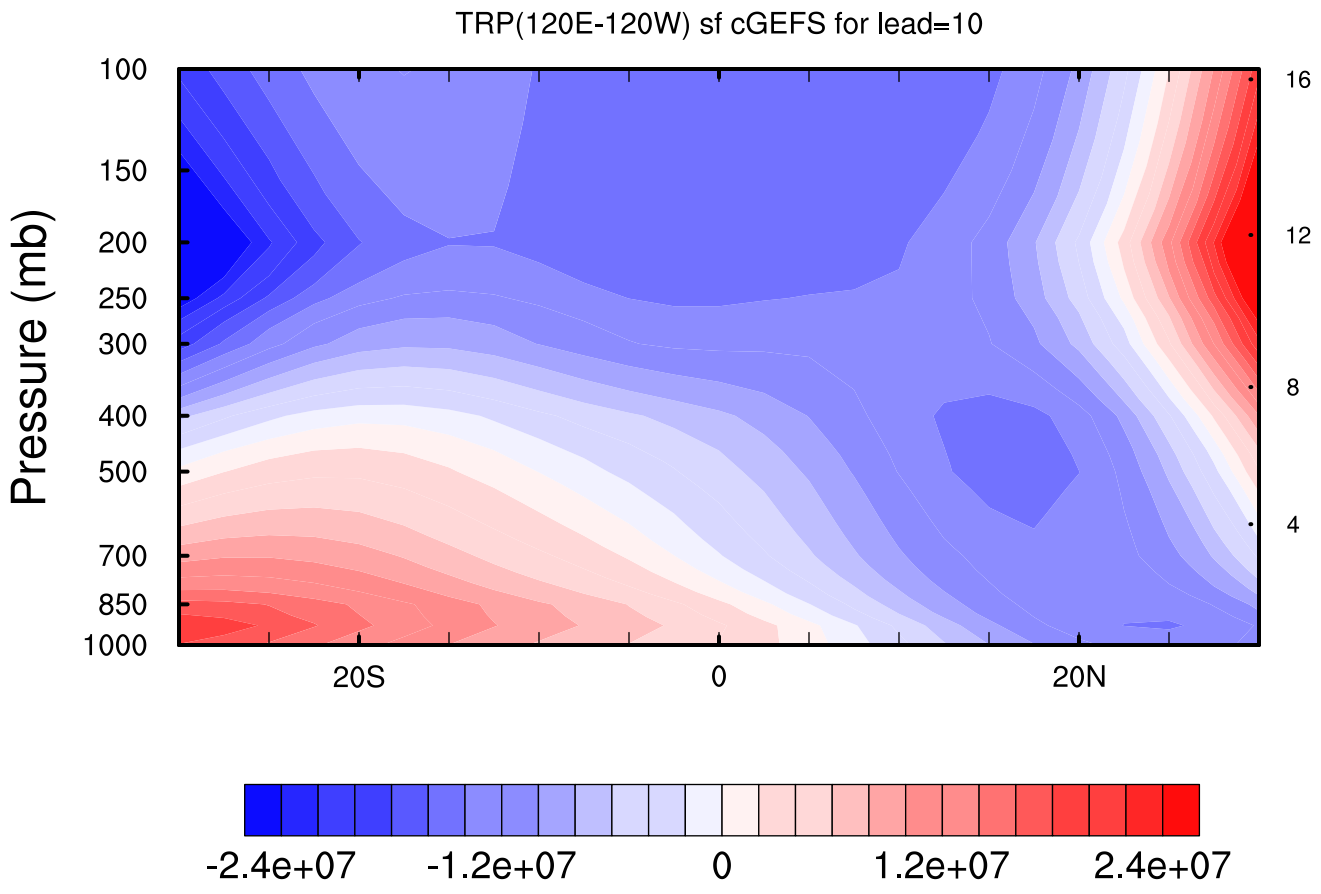

TR(5S-5N) sf cGEFS for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

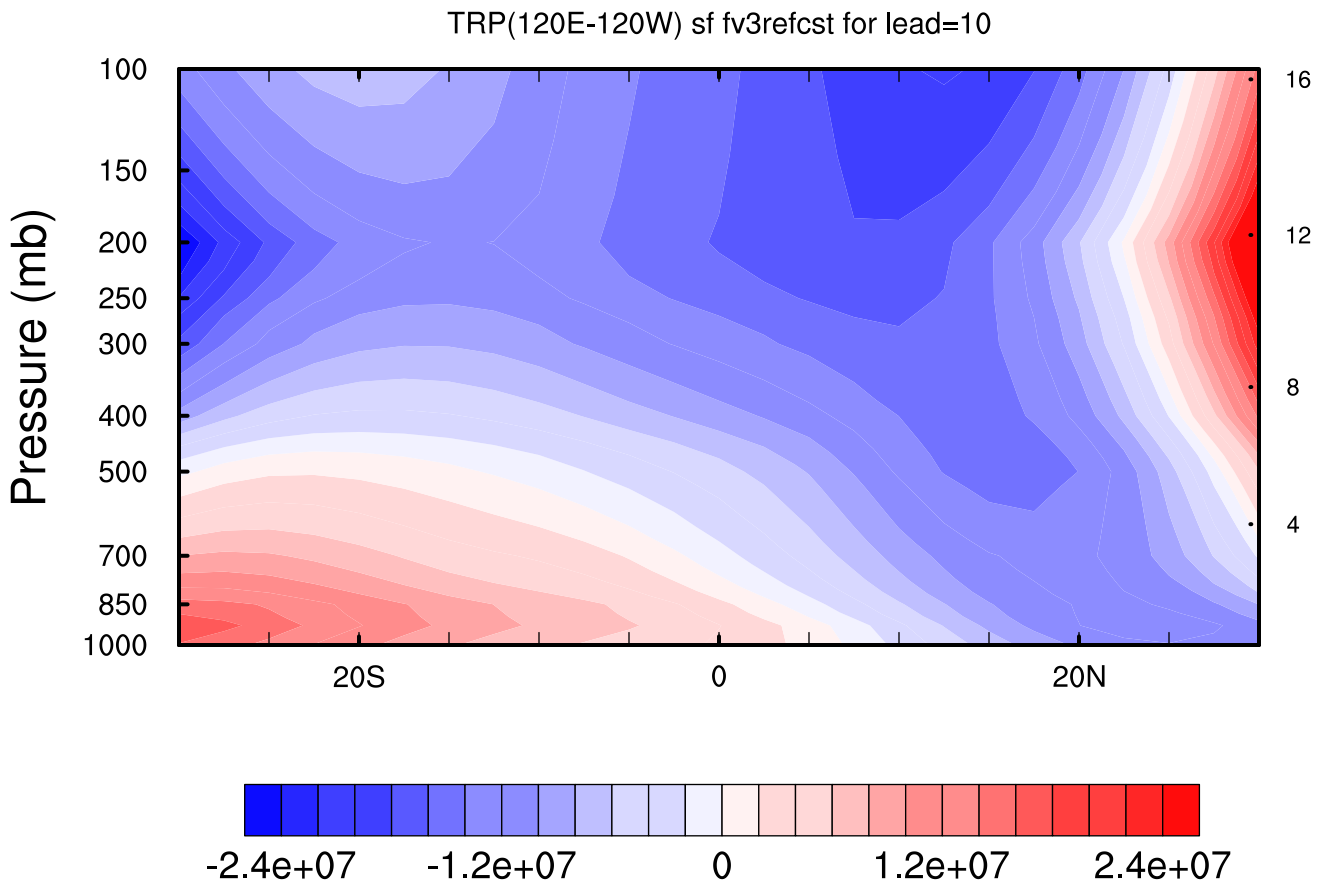

TR(5S-5N) sf fv3refcst for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

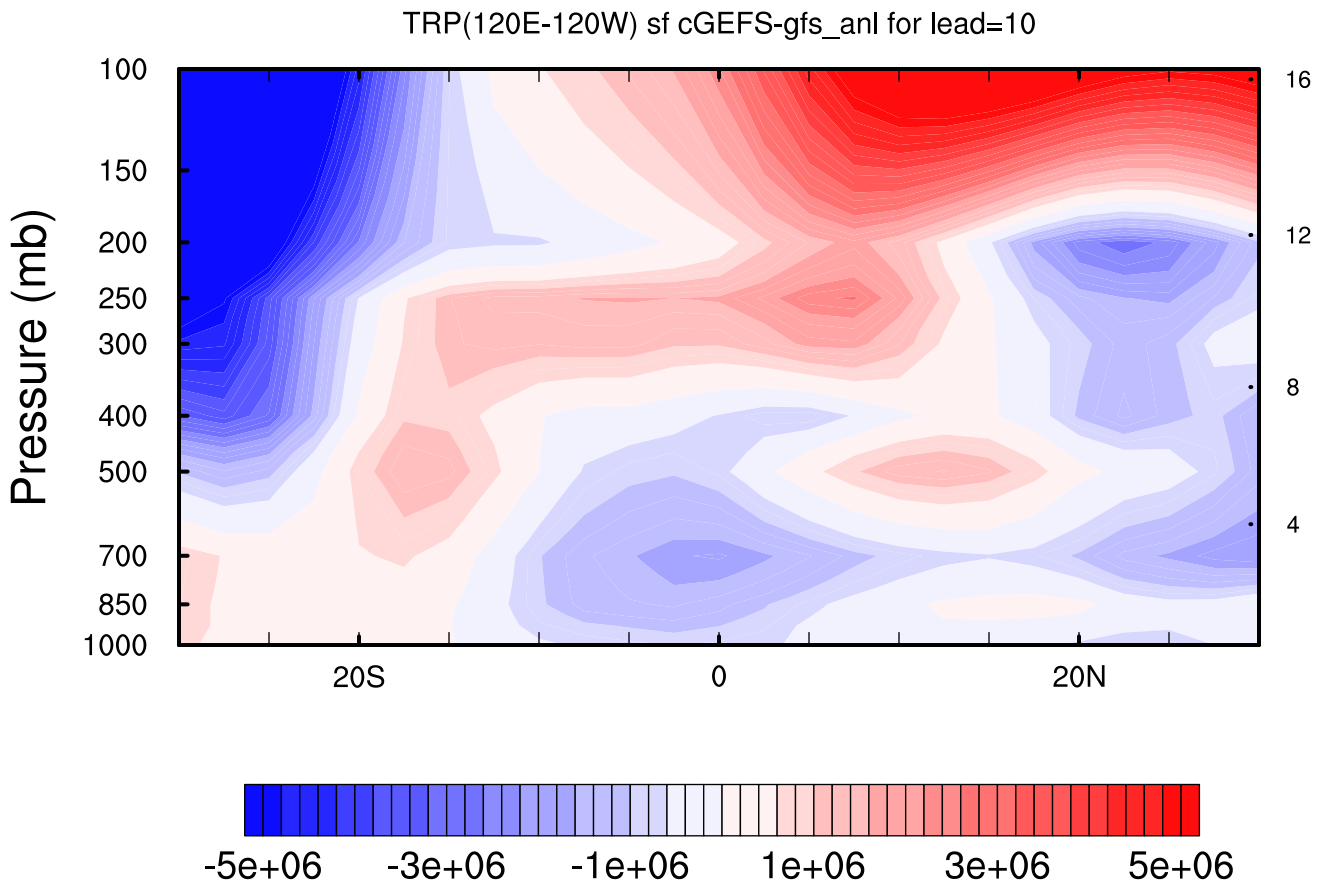

TR(5S-5N) sf cGEFS-gfs_anl for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

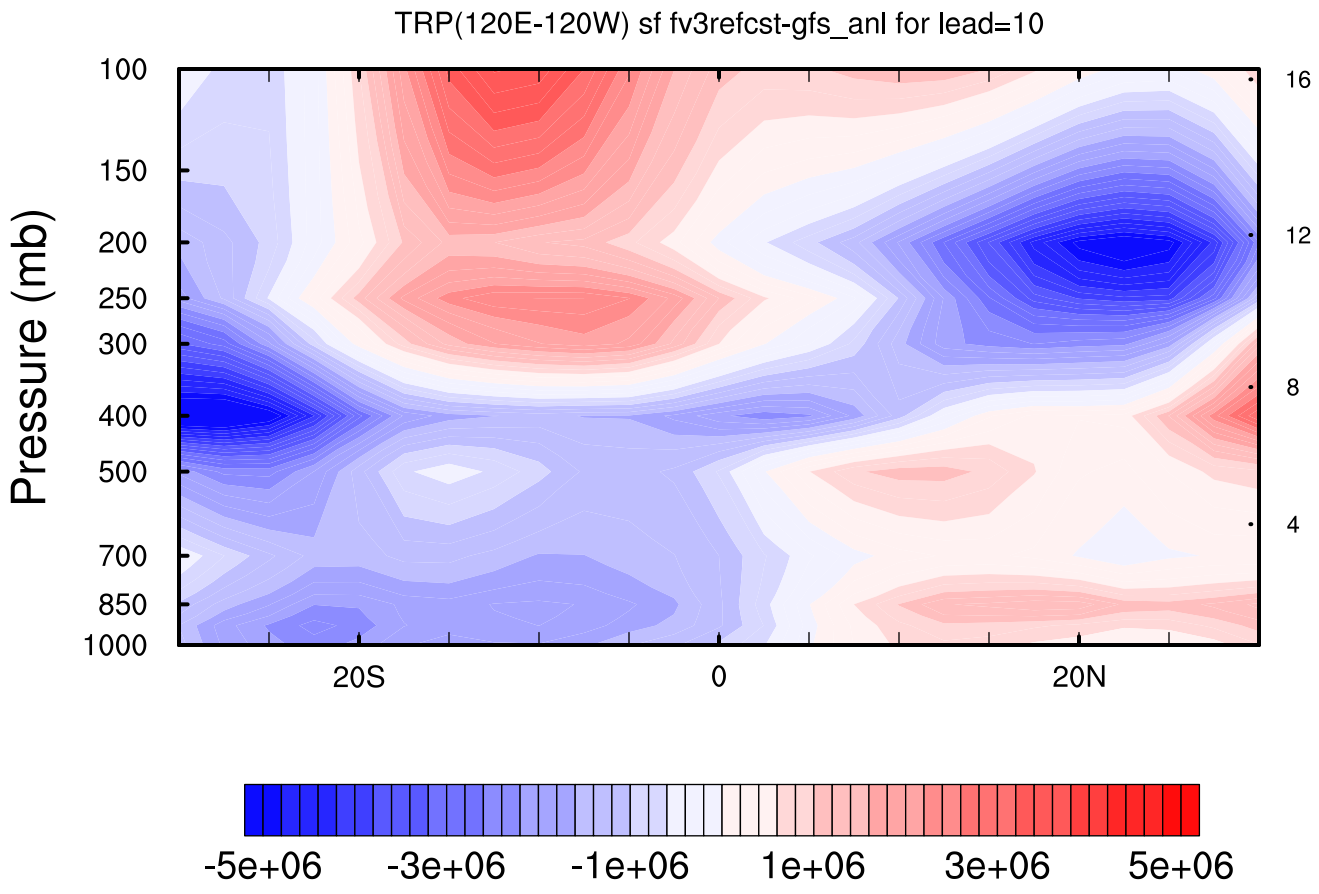

TR(5S-5N) sf fv3refcst-gfs_anl for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

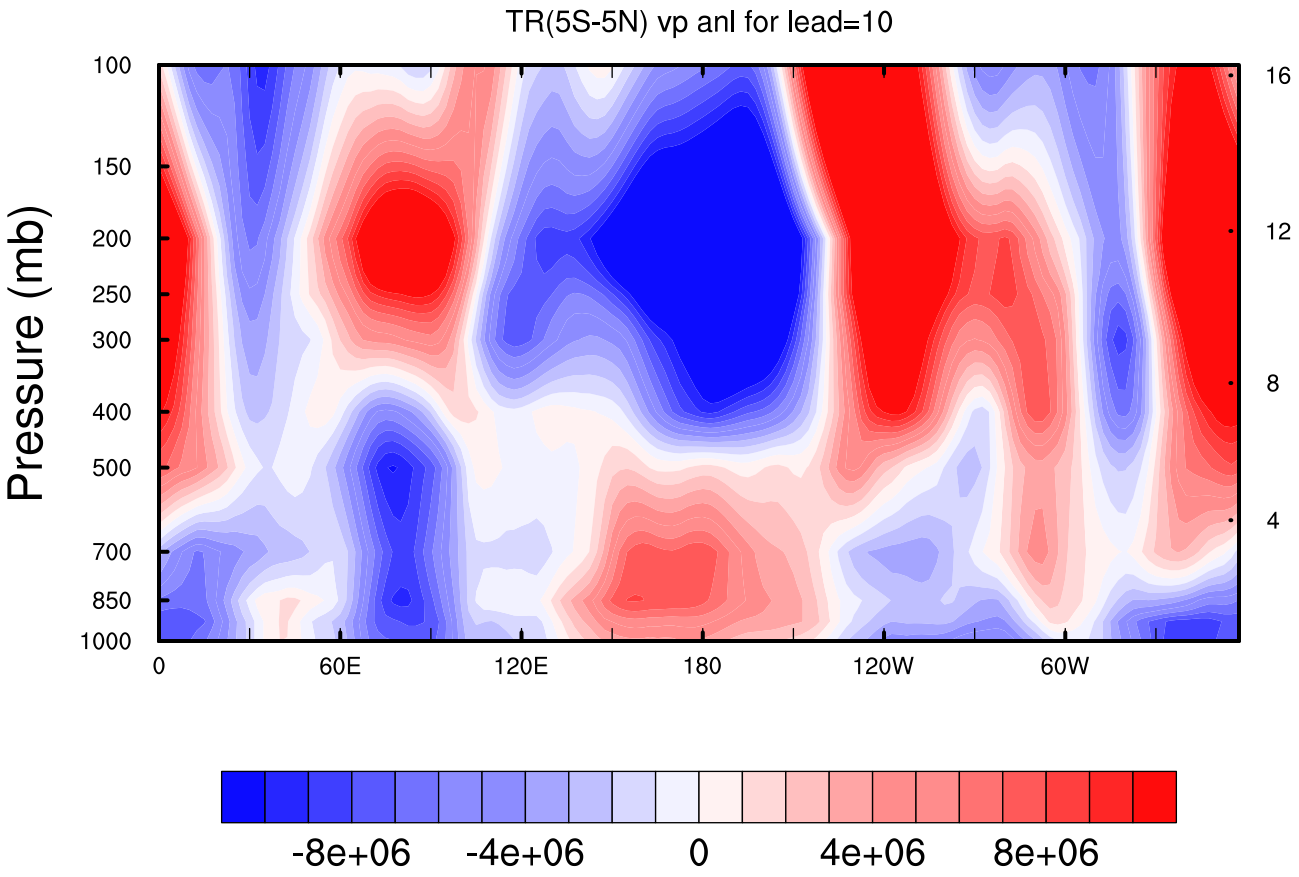

TRP(120E-120W) sf anl for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

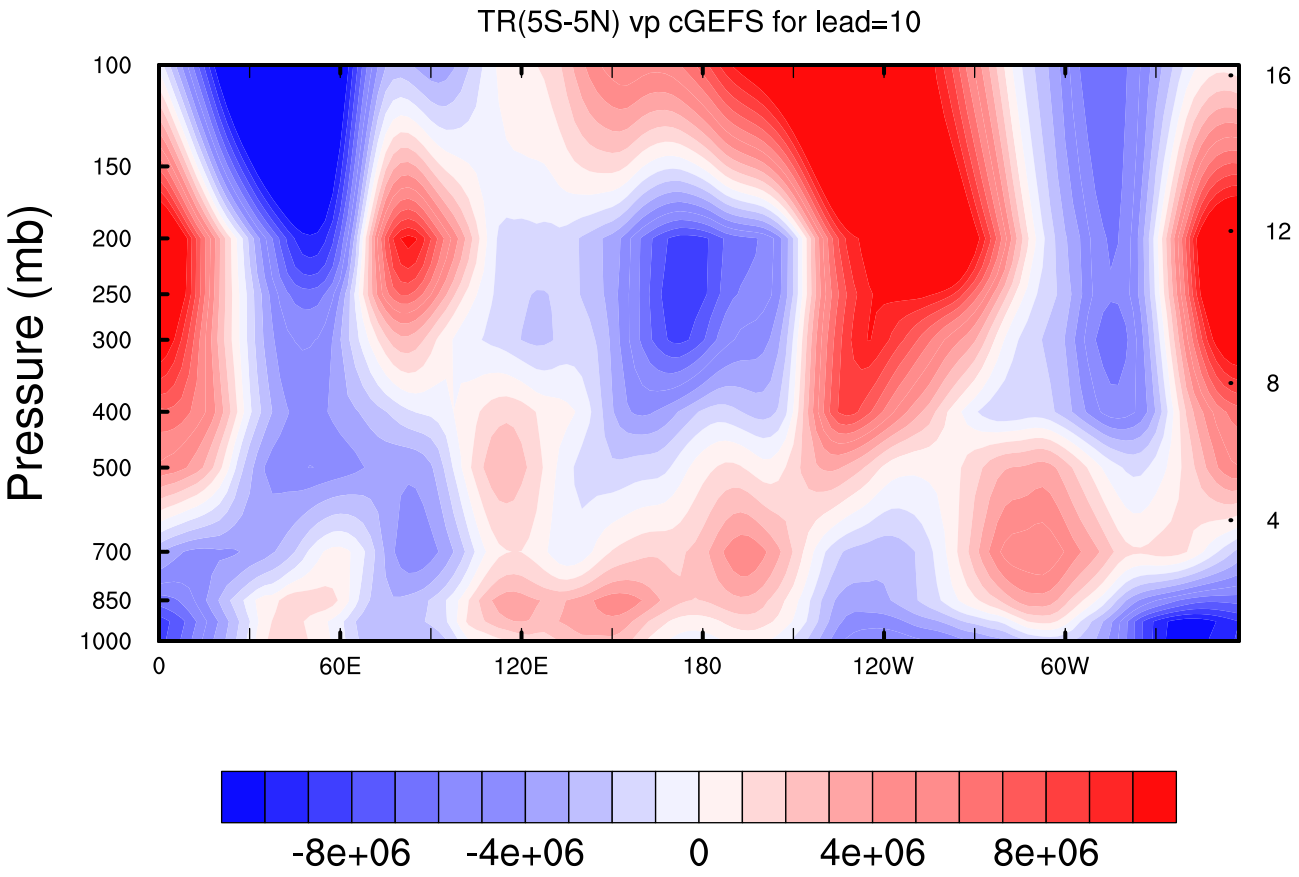

TRP(120E-120W) sf cGEFS for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

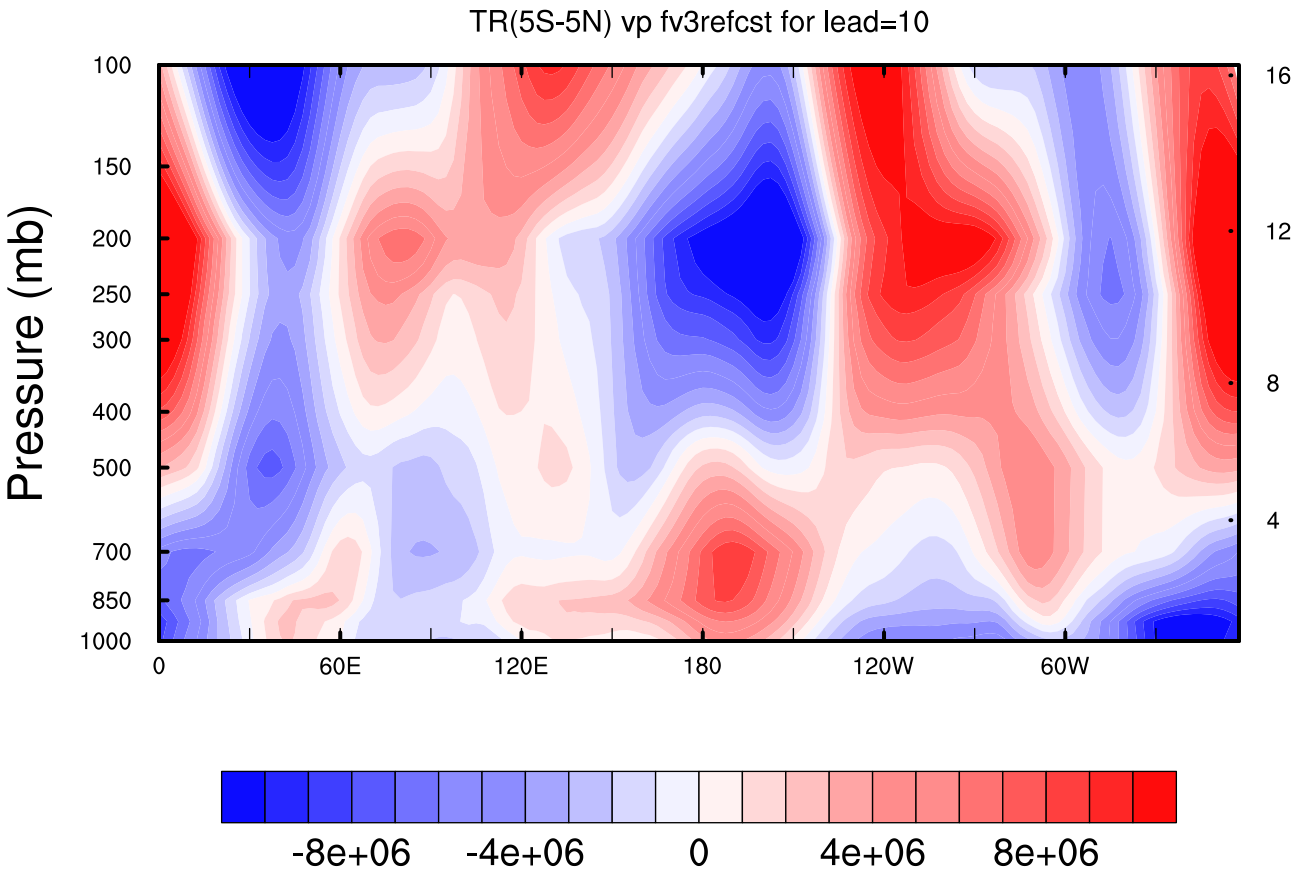

TRP(120E-120W) sf fv3refcst for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

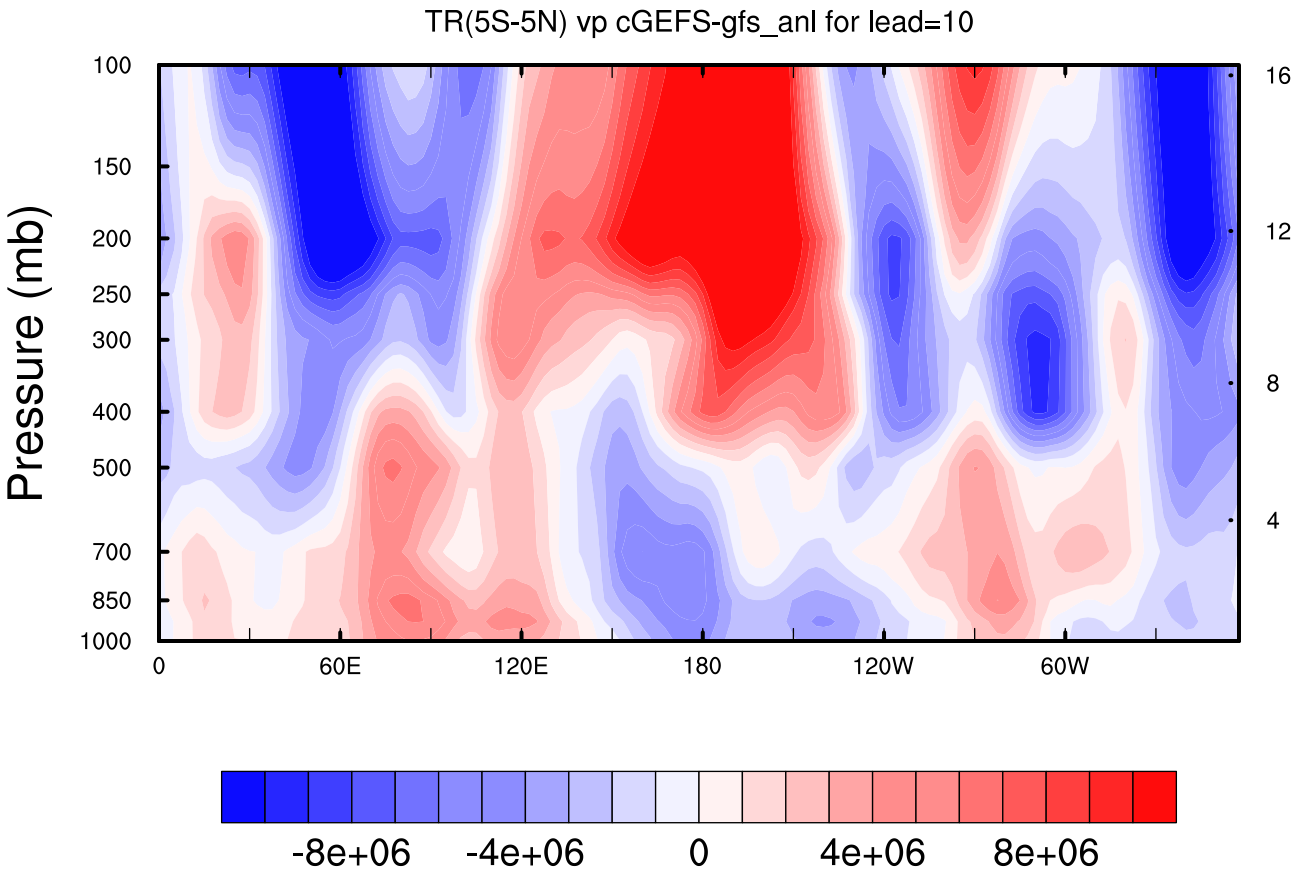

TRP(120E-120W) sf cGEFS-gfs_anl for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

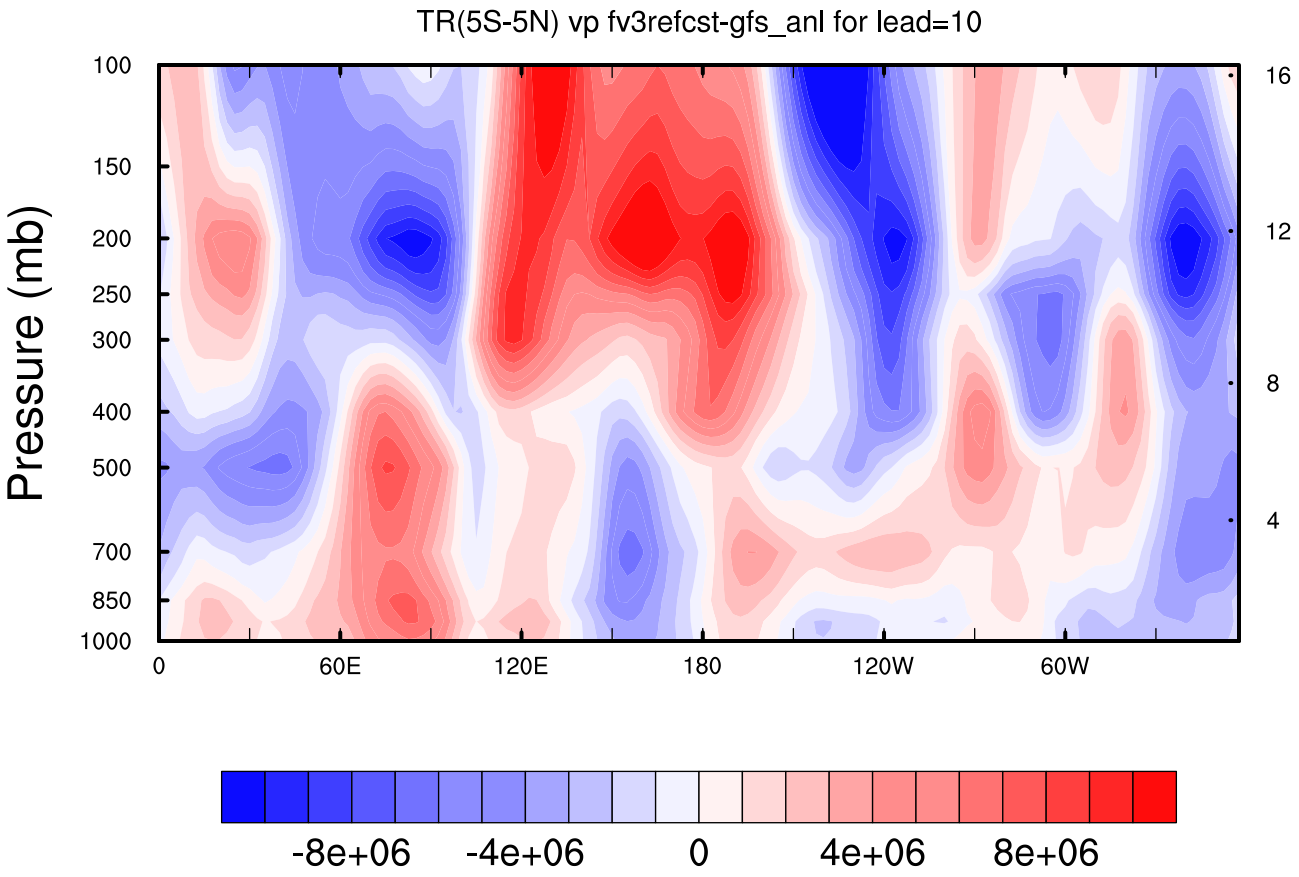

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

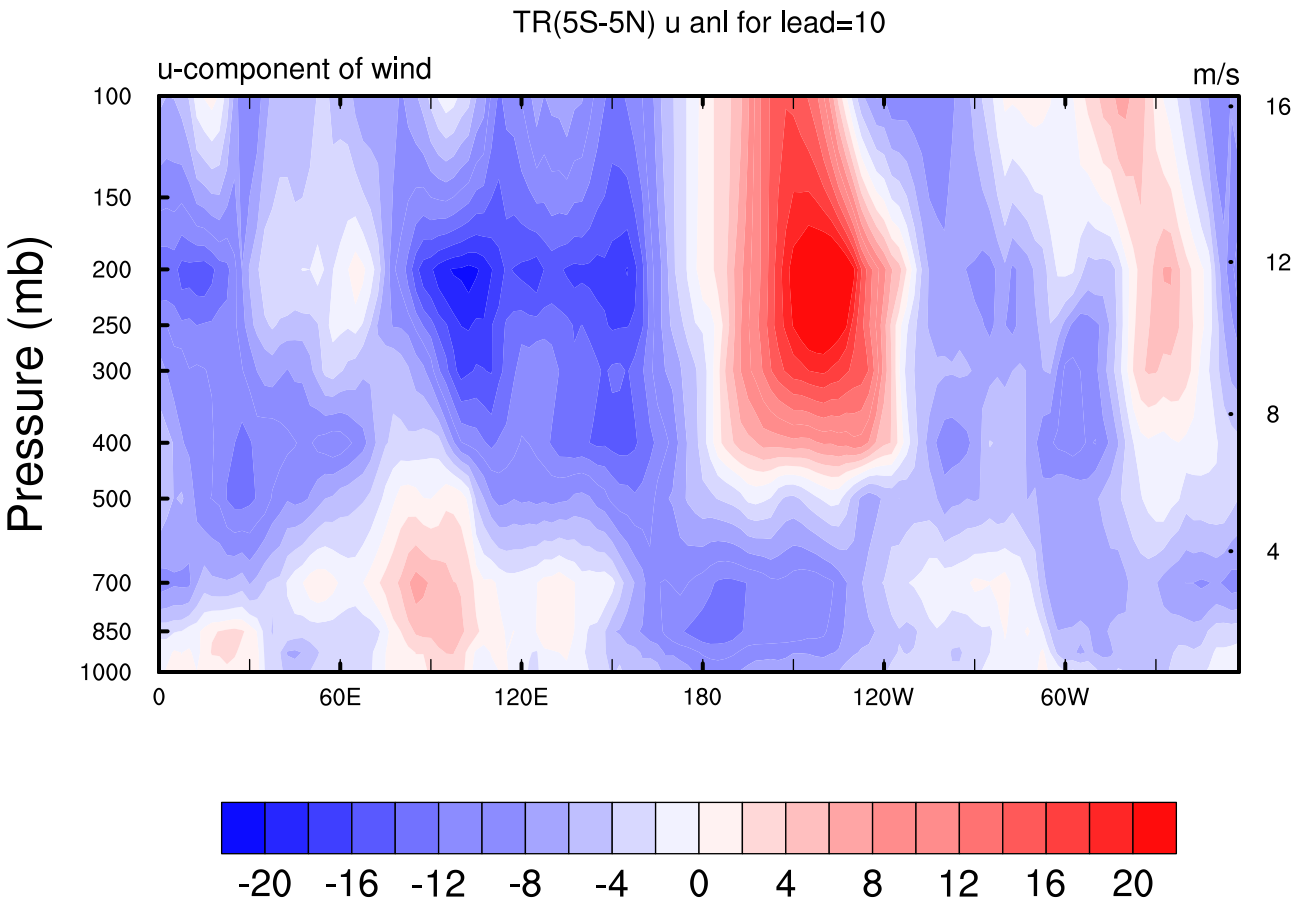

TR(5S-5N) vp anl for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

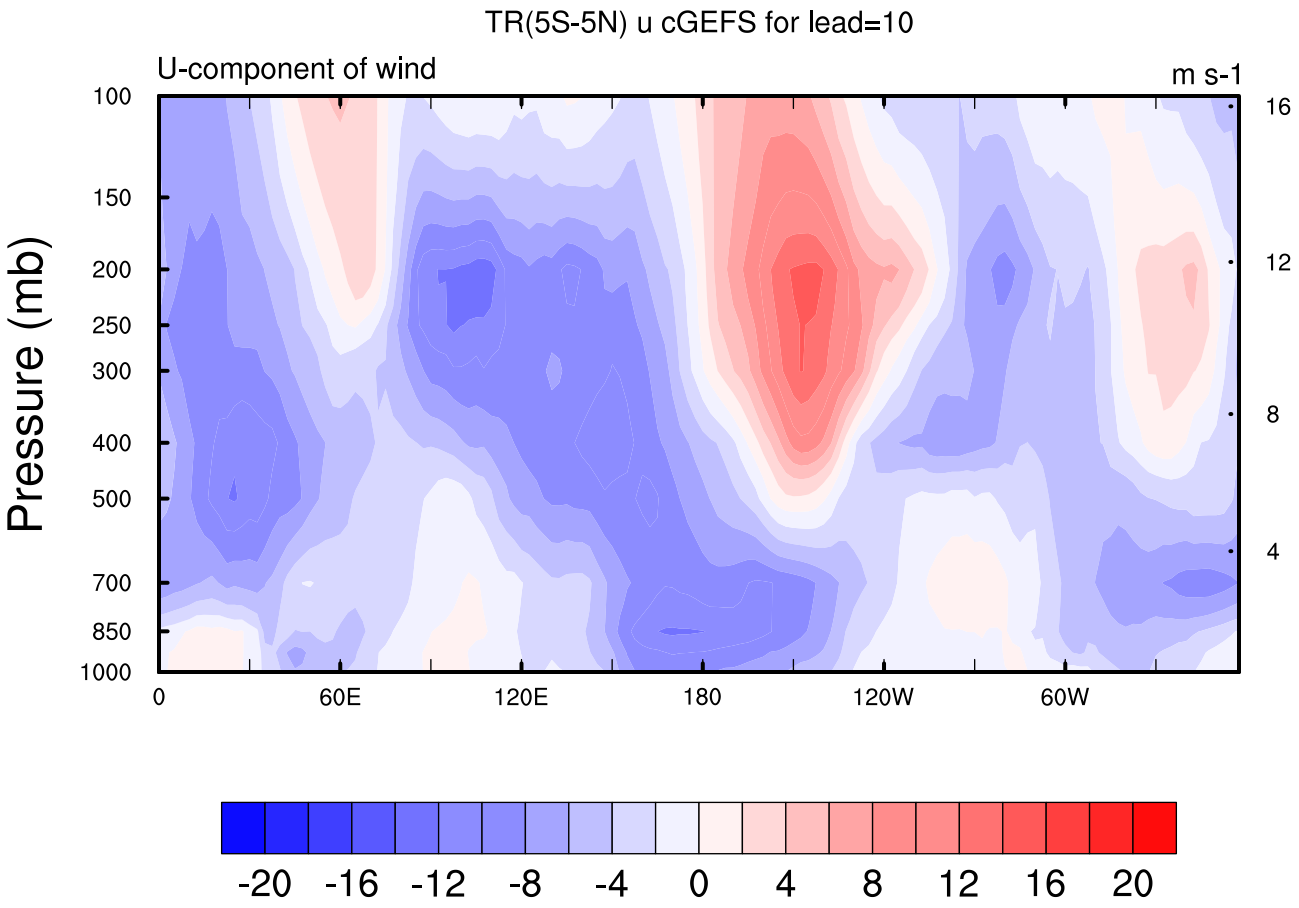

TR(5S-5N) vp cGEFS for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

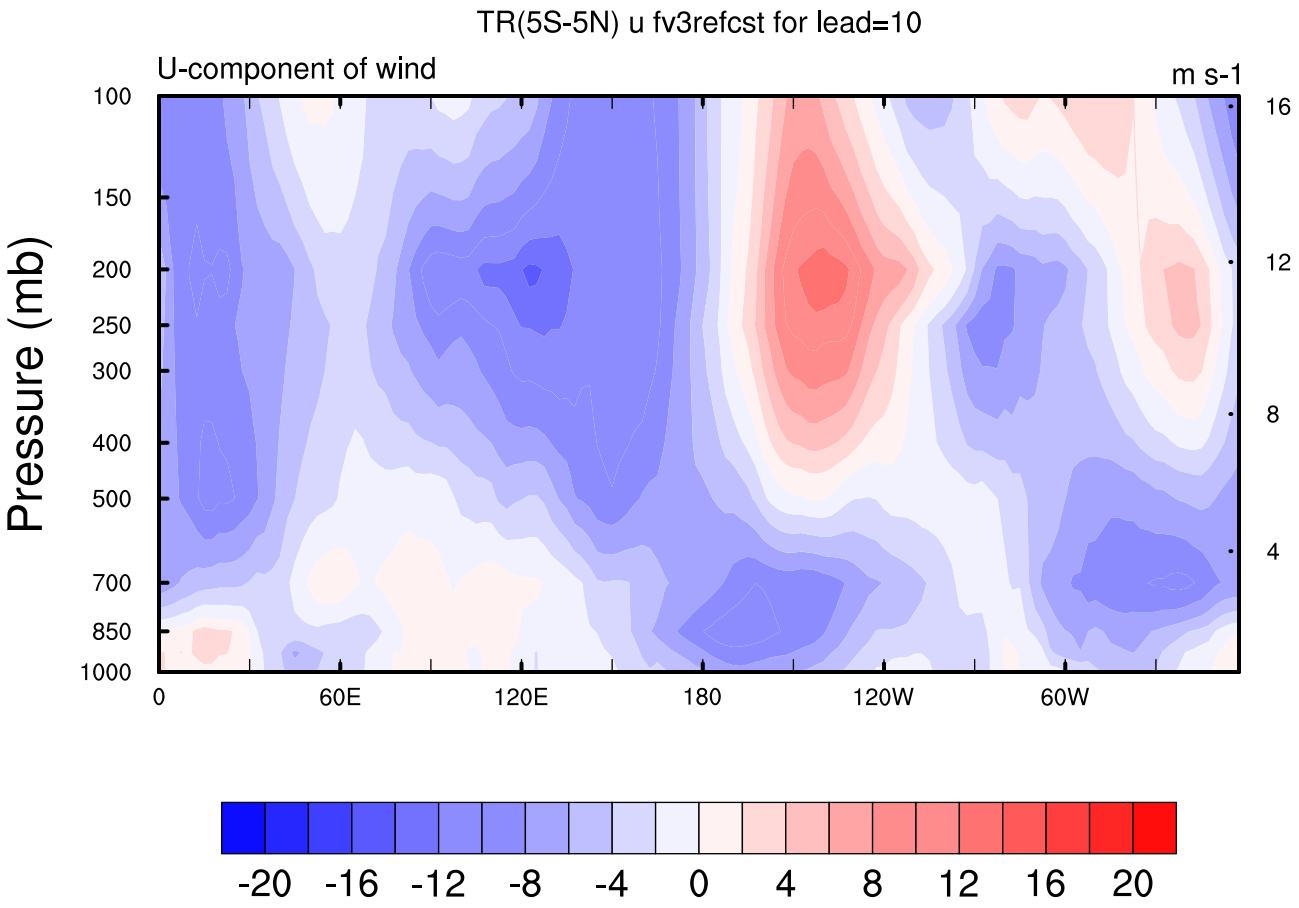

TR(5S-5N) vp fv3refcst for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

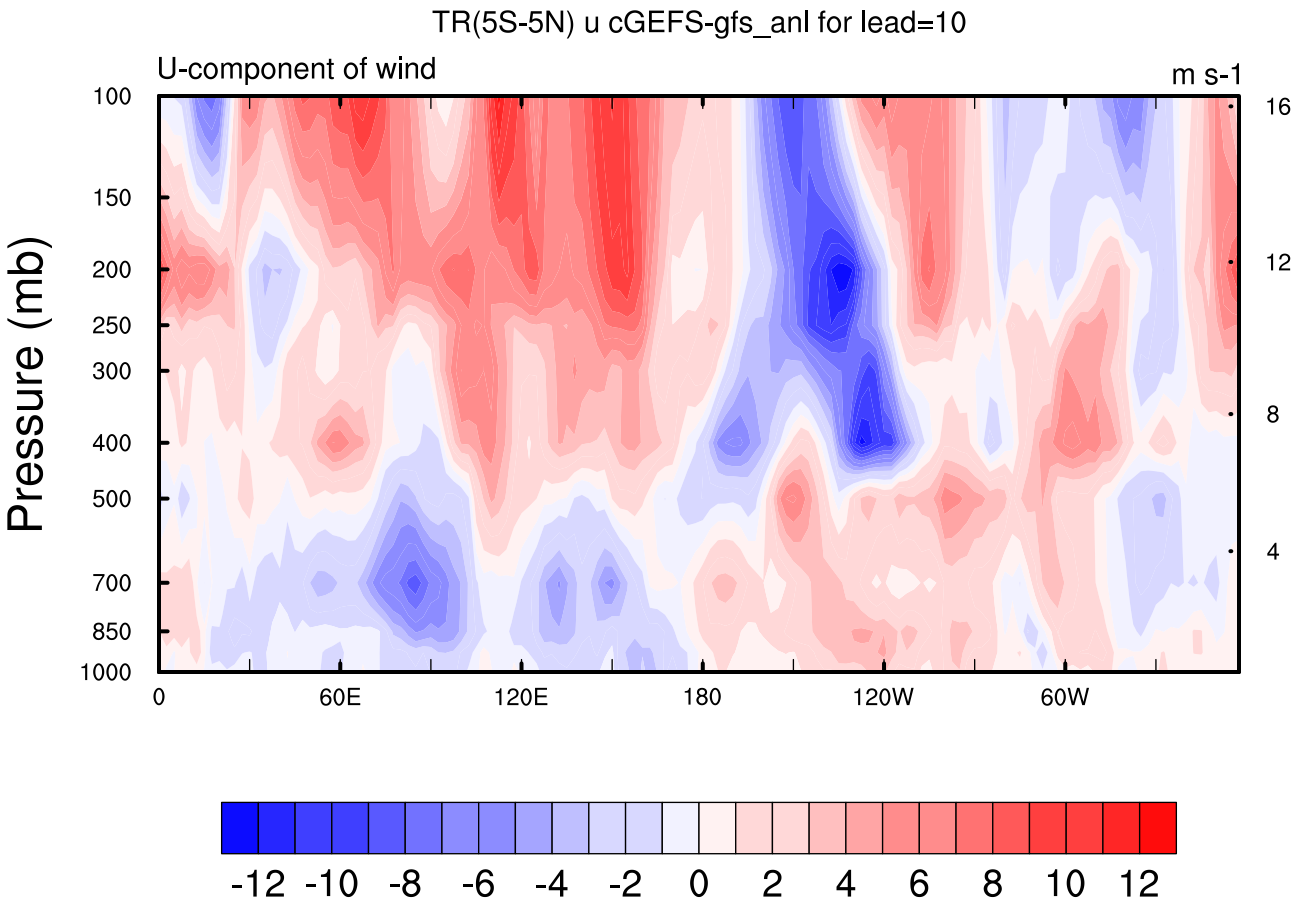

TR(5S-5N) vp cGEFS-gfs_anl for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

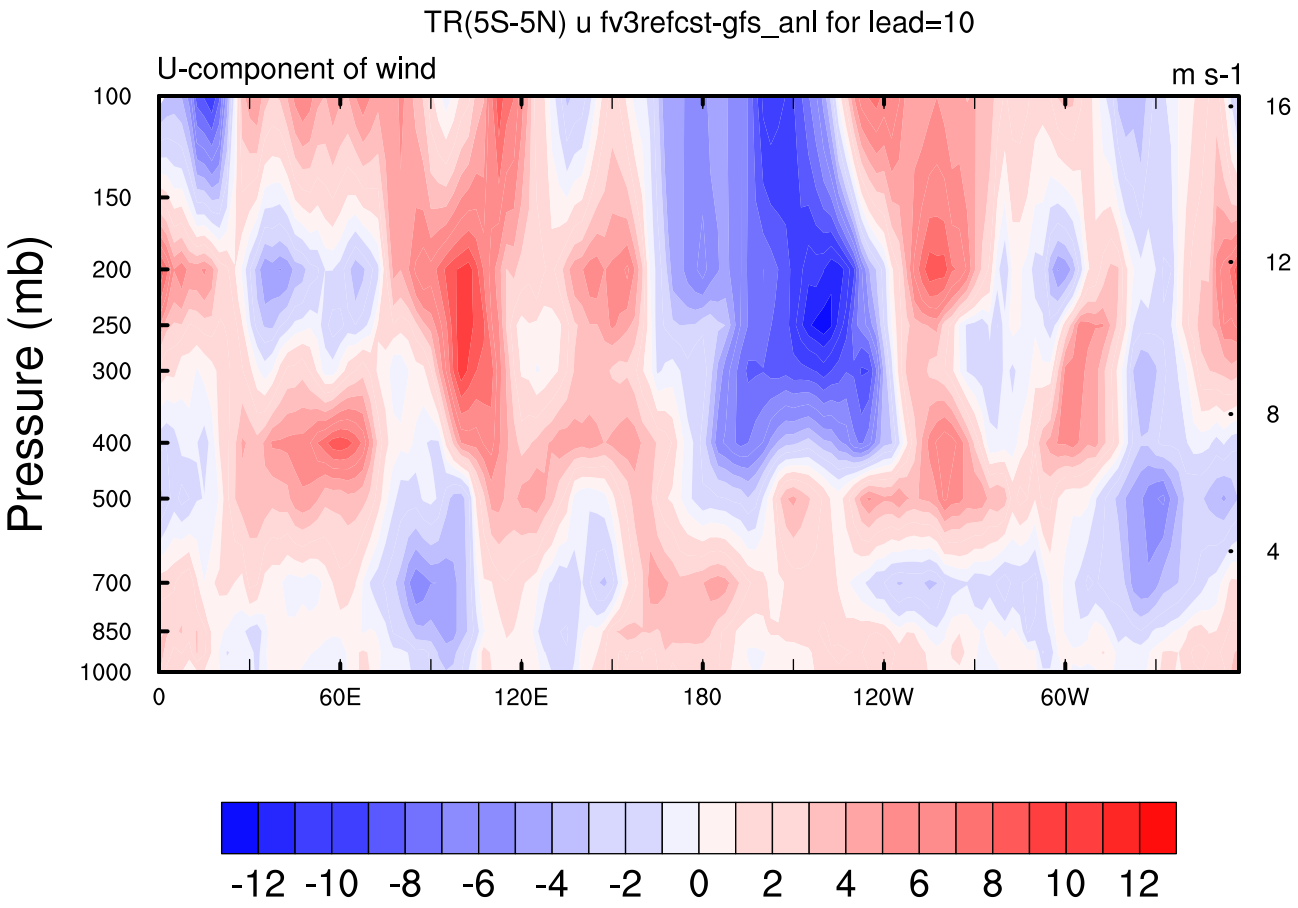

TR(5S-5N) vp fv3refcst-gfs_anl for lead=10
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

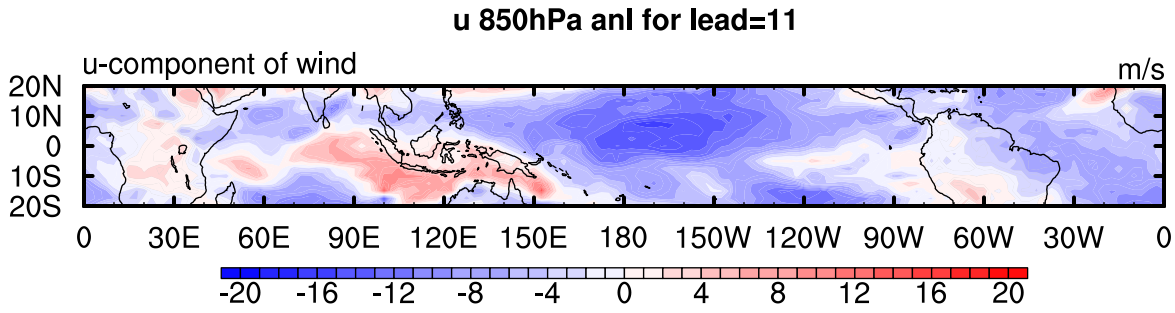

TR(5S-5N) u anl for lead=10
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

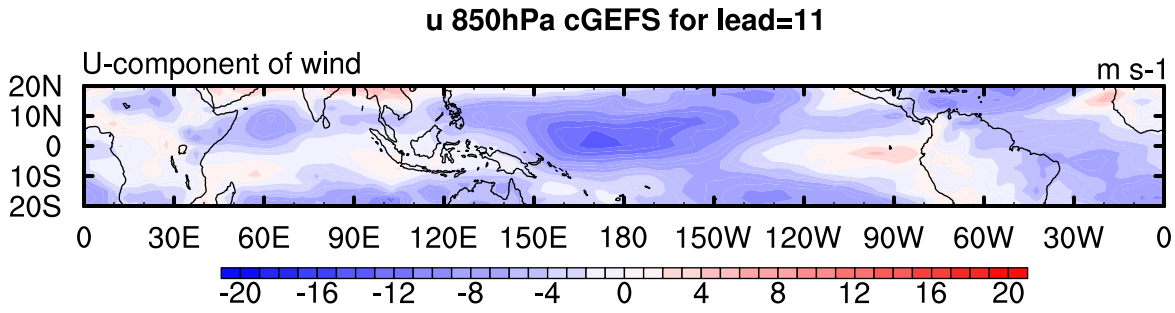

TR(5S-5N) u cGEFS for lead=10
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

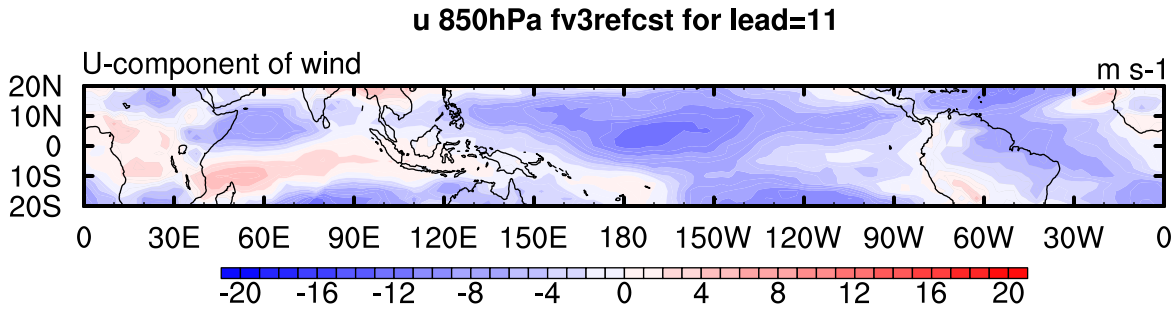

TR(5S-5N) u fv3refcst for lead=10
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

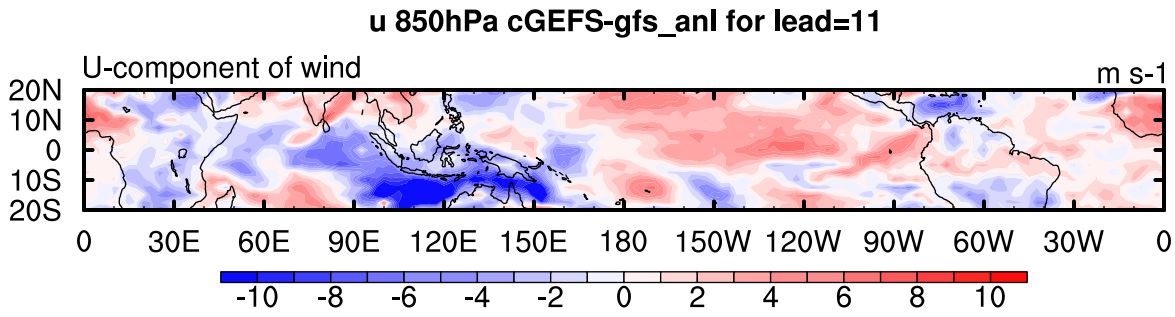

TR(5S-5N) u cGEFS-gfs_anl for lead=10
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

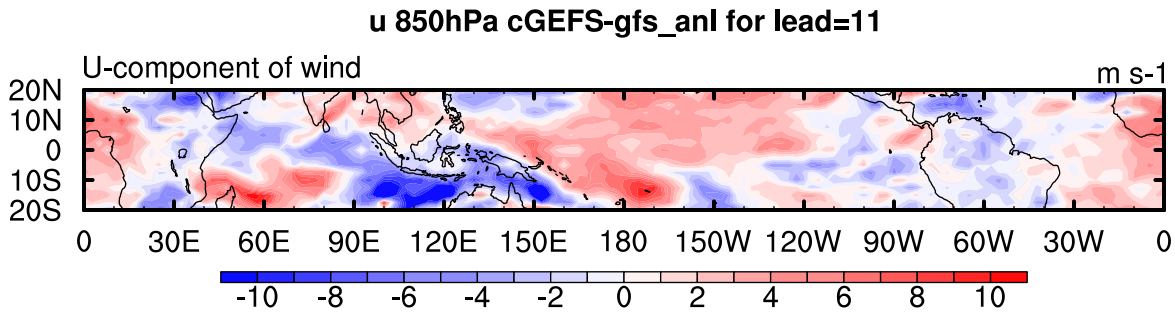

TR(5S-5N) u fv3refcst-gfs_anl for lead=10
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

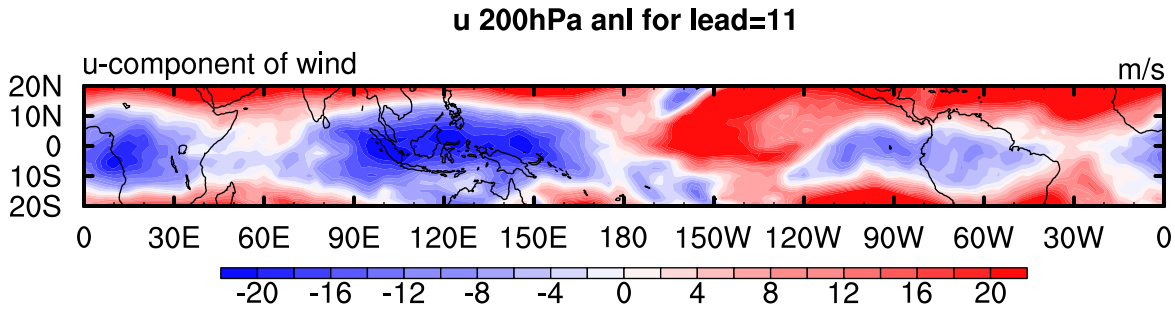

u 850hPa anl for lead=11
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

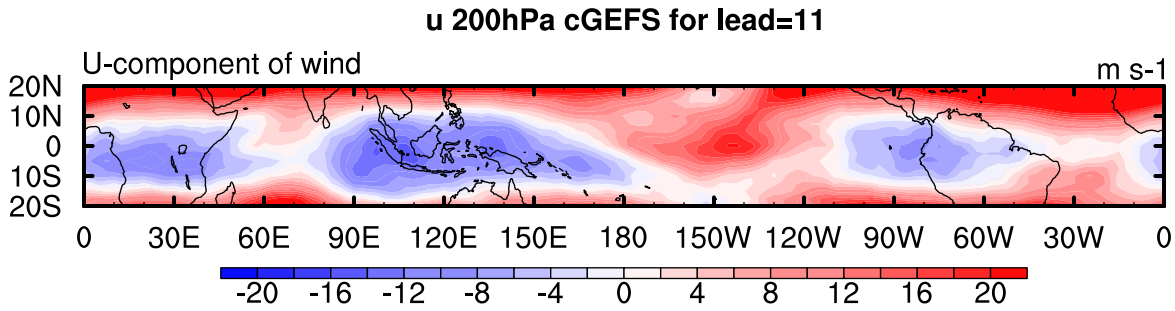

u 850hPa cGEFS for lead=11
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa fv3refcst for lead=11
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=11
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 850hPa cGEFS-gfs_anl for lead=11
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=11
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=11
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
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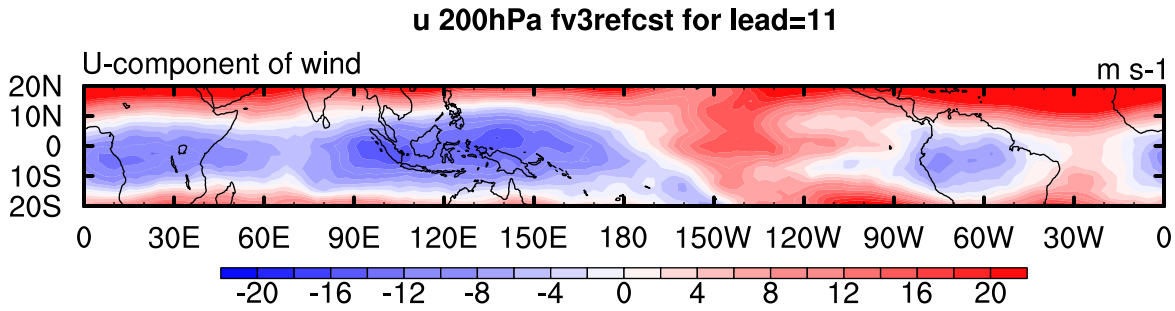
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=11
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
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-4
0
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16
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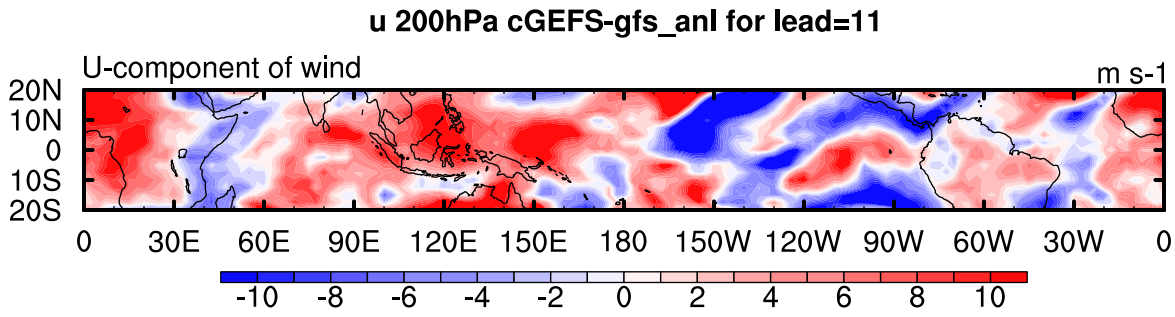
u 200hPa cGEFS-gfs_anl for lead=11
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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30W
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-10
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-2
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8
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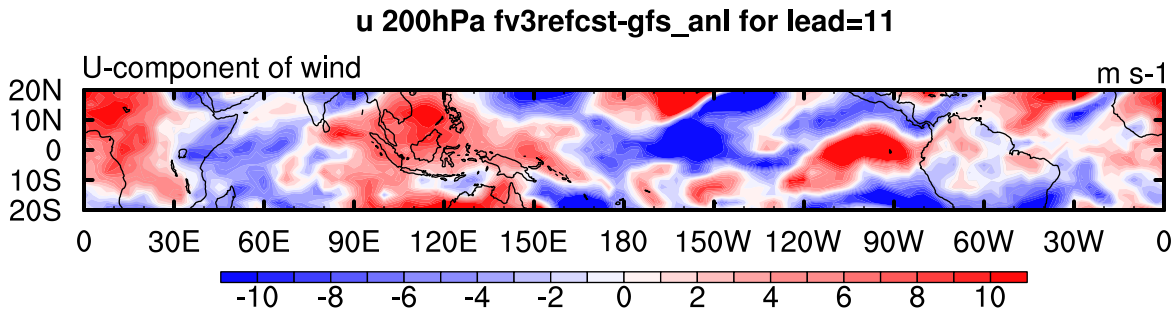
u 200hPa fv3refcst-gfs_anl for lead=11
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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30W
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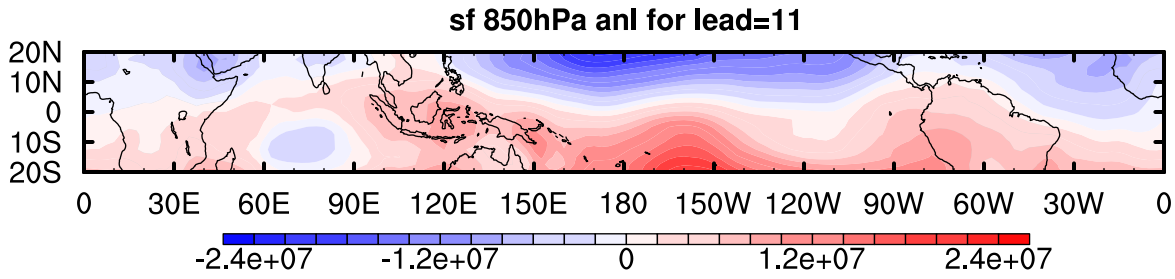
8
10


sf 850hPa anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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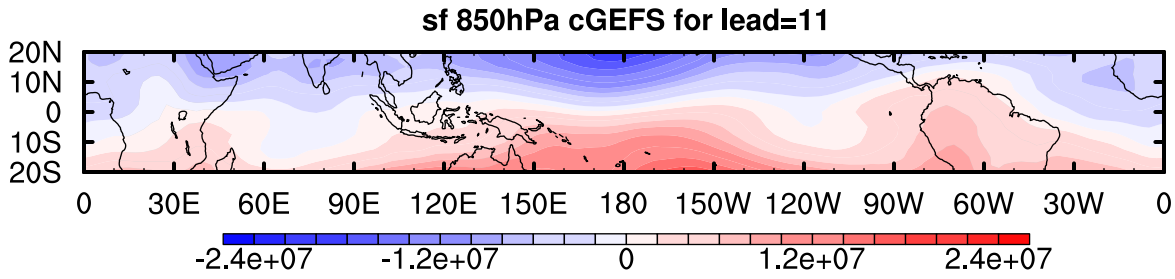
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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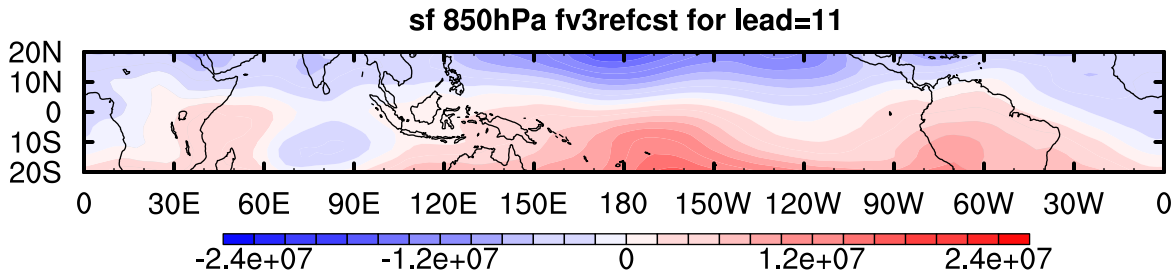
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-1.2e+07
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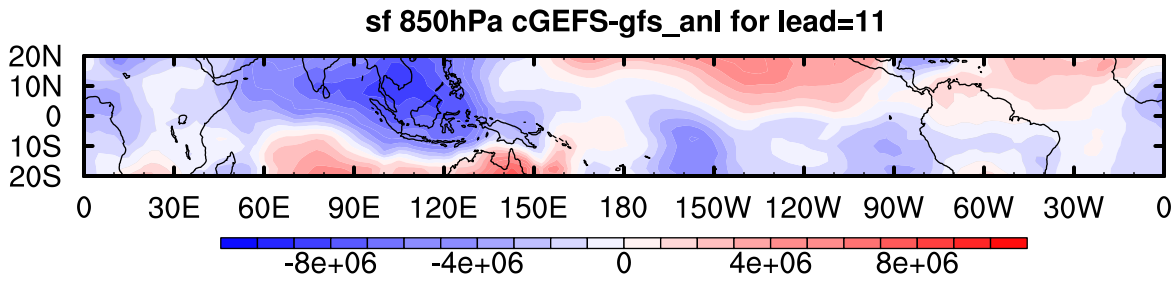
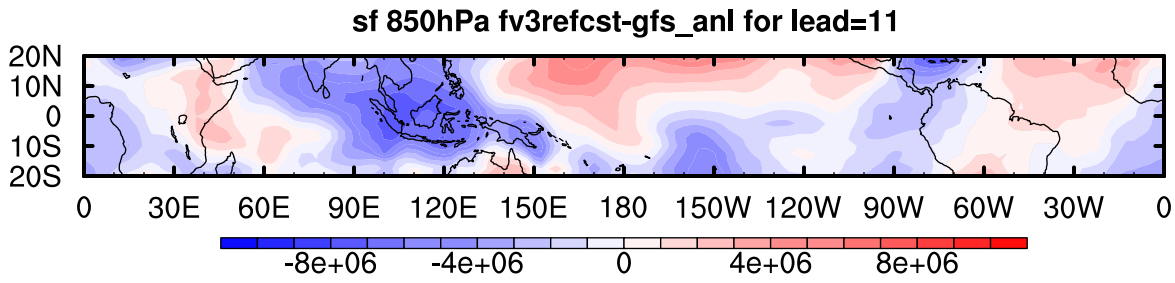
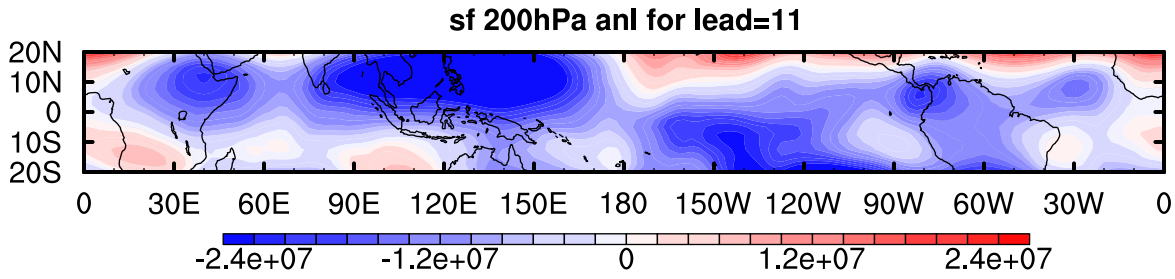
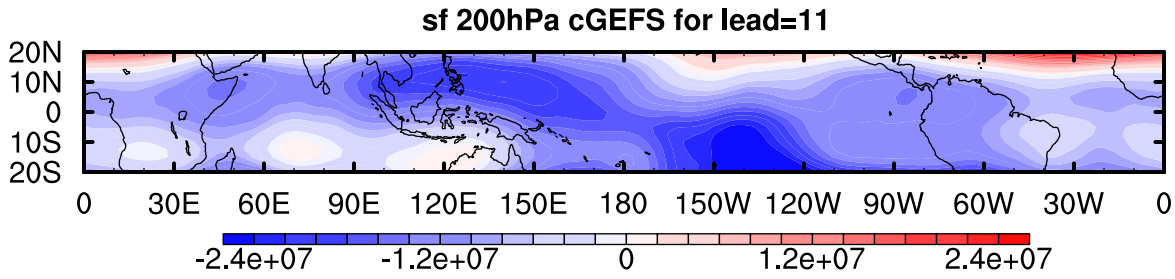
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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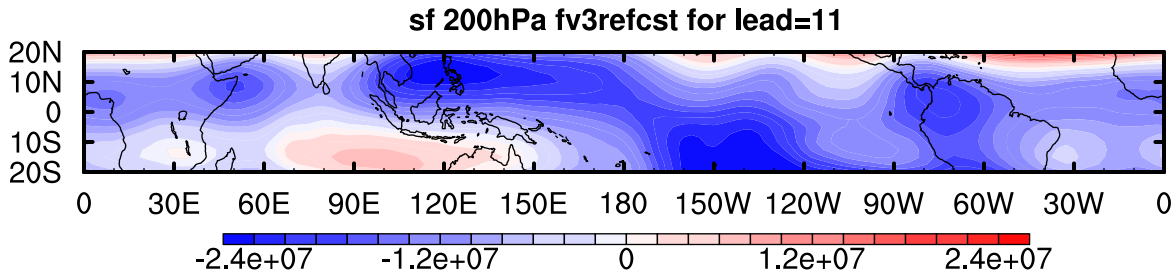
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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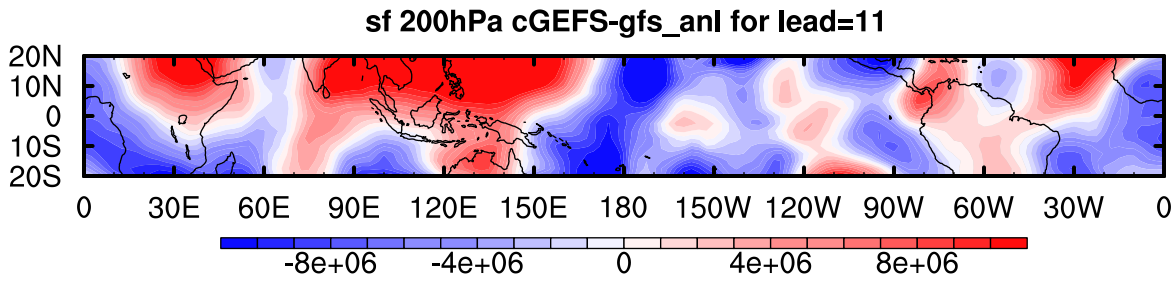
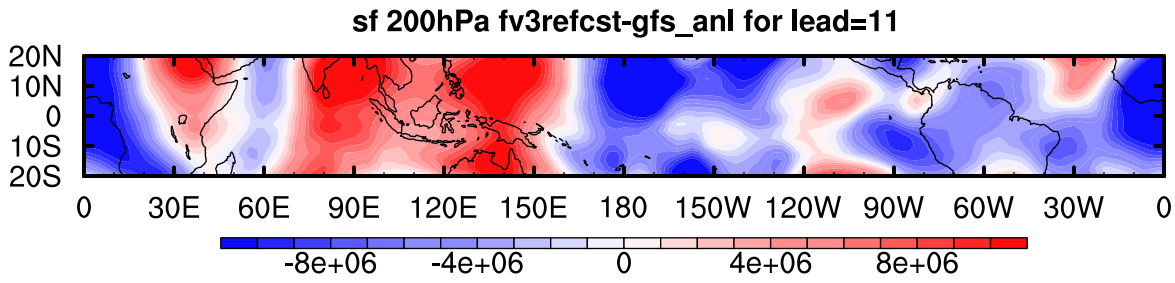
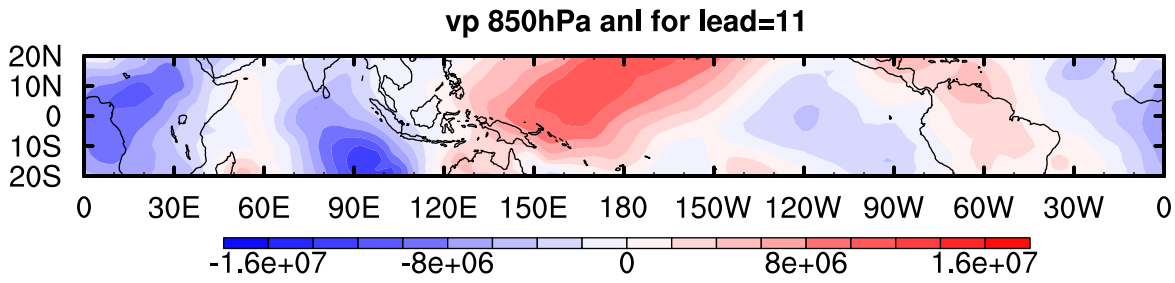
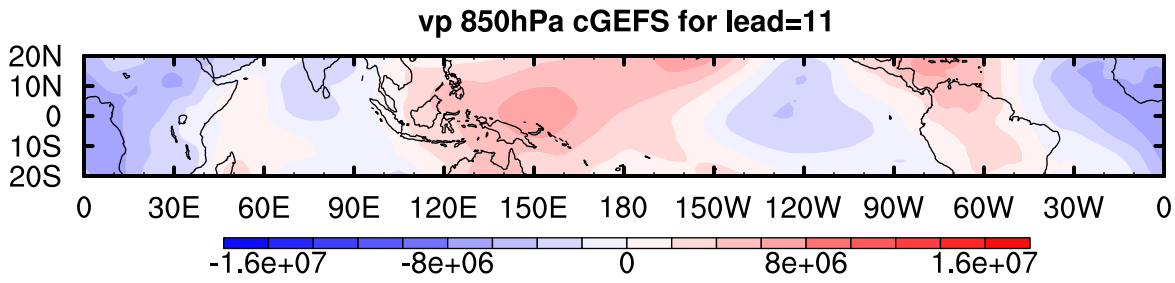
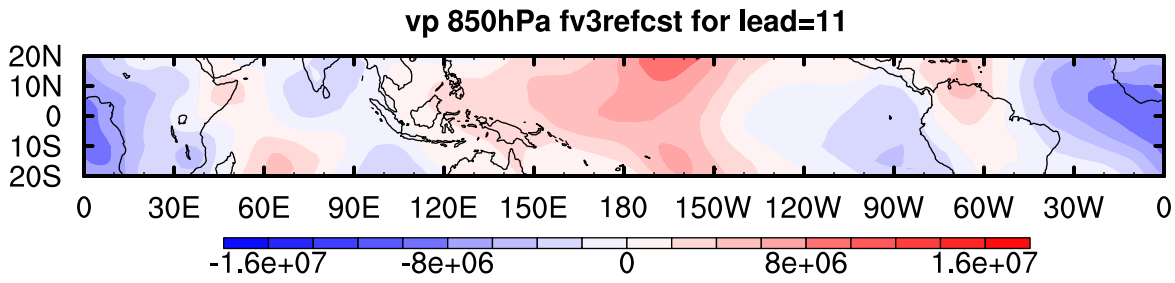
-1.2e+07
0
1.2e+07
2.4e+07

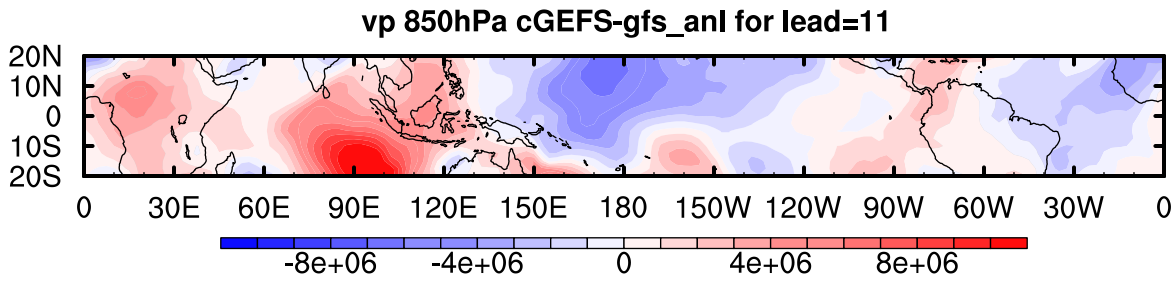

sf 200hPa cGEFS-gfs_anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

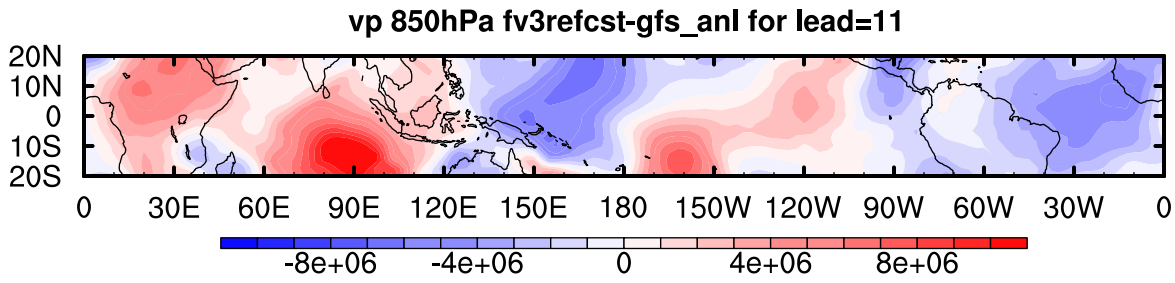

sf 200hPa fv3refcst-gfs_anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

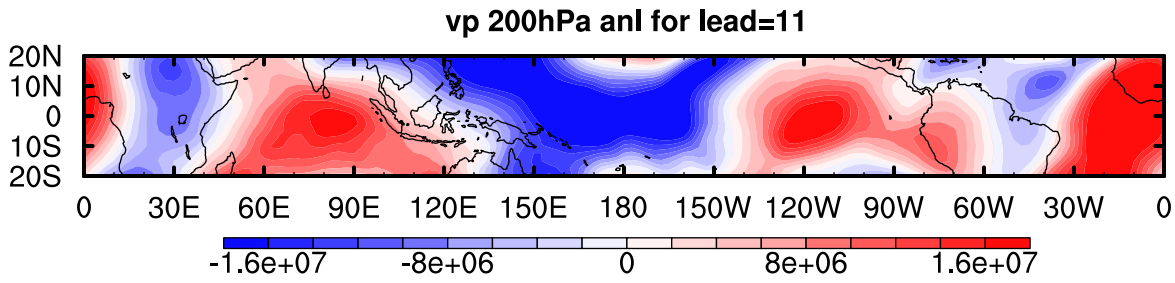

vp 850hPa anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

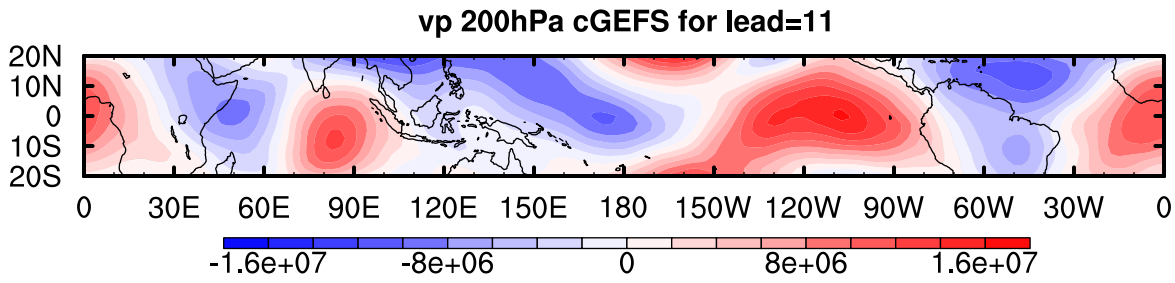

vp 850hPa cGEFS for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

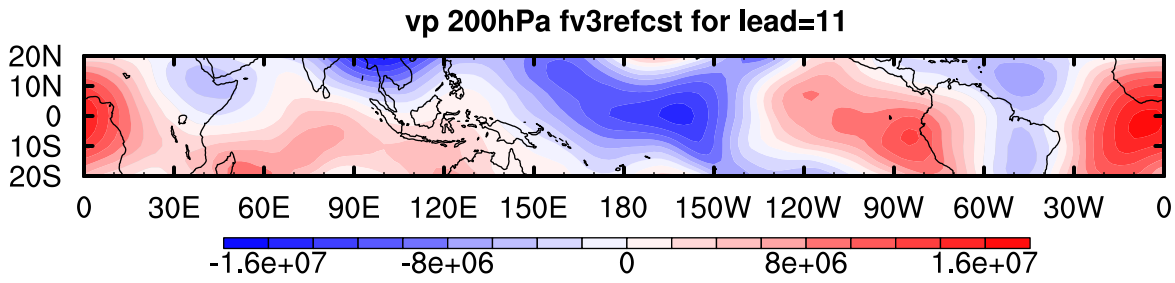

vp 850hPa fv3refcst for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

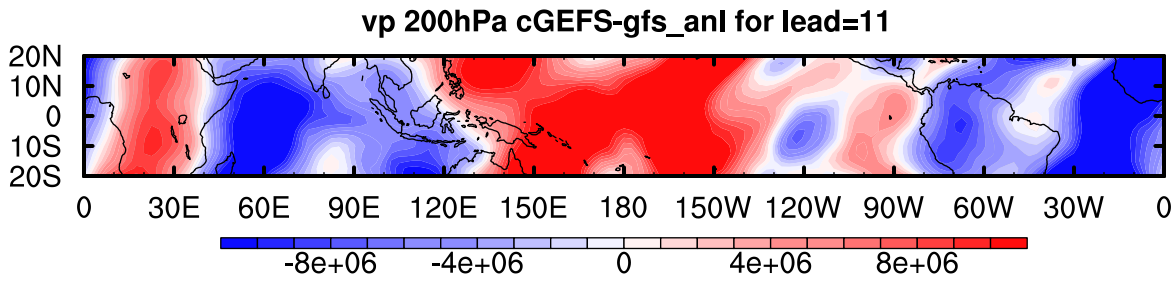

vp 850hPa cGEFS-gfs_anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

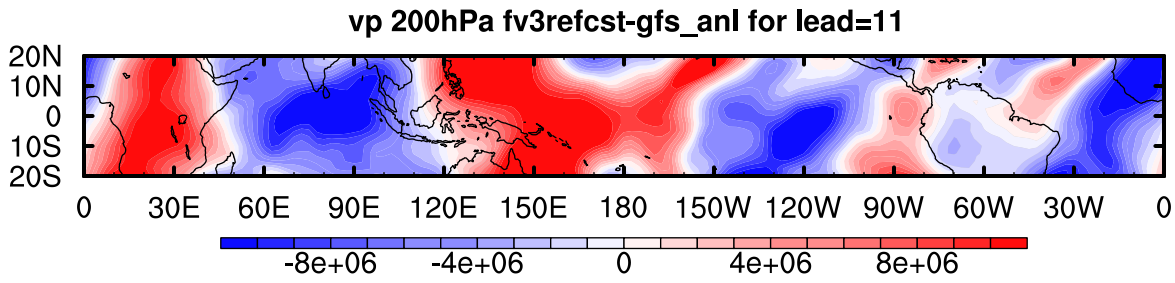

vp 850hPa fv3refcst-gfs_anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

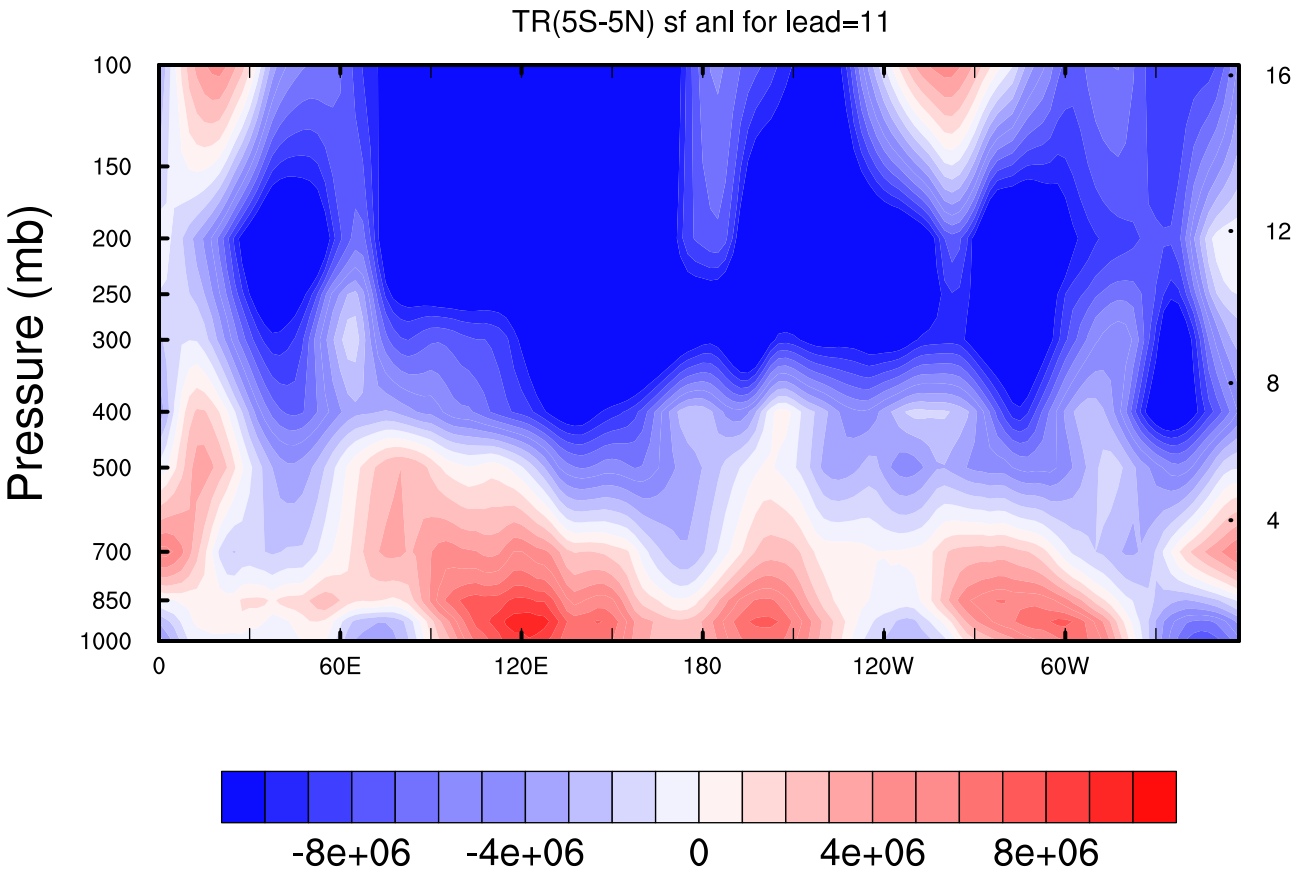

vp 200hPa anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

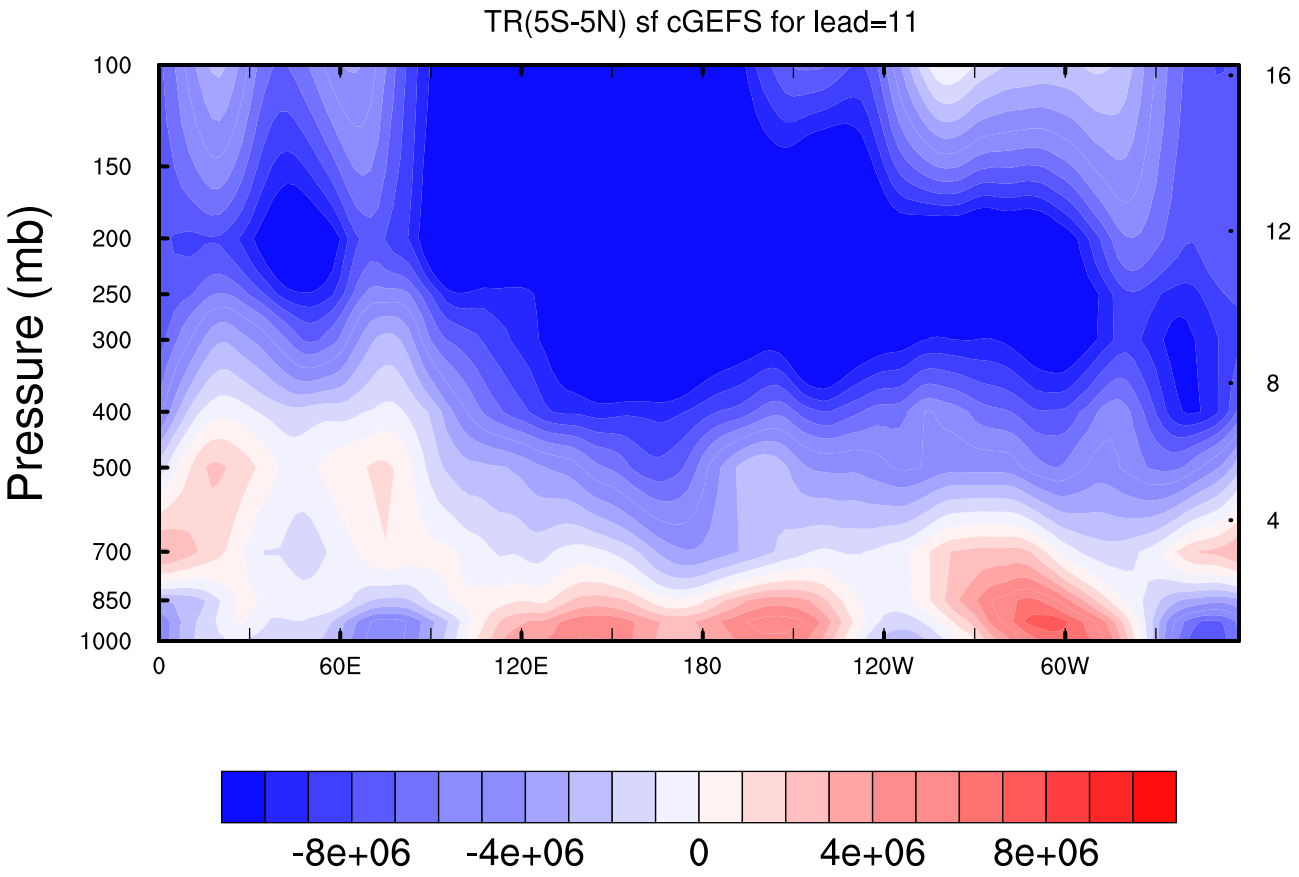

vp 200hPa cGEFS for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

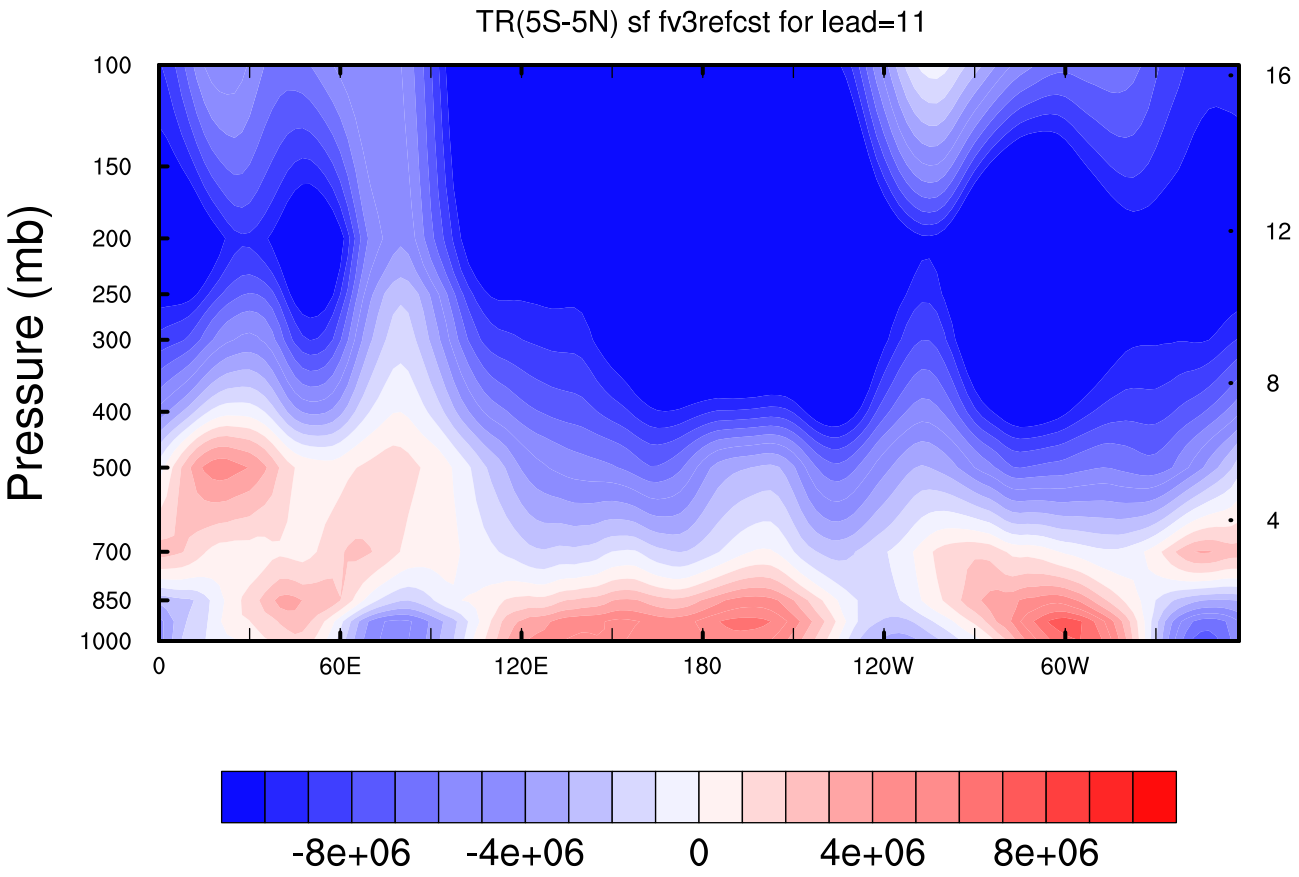

vp 200hPa fv3refcst for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

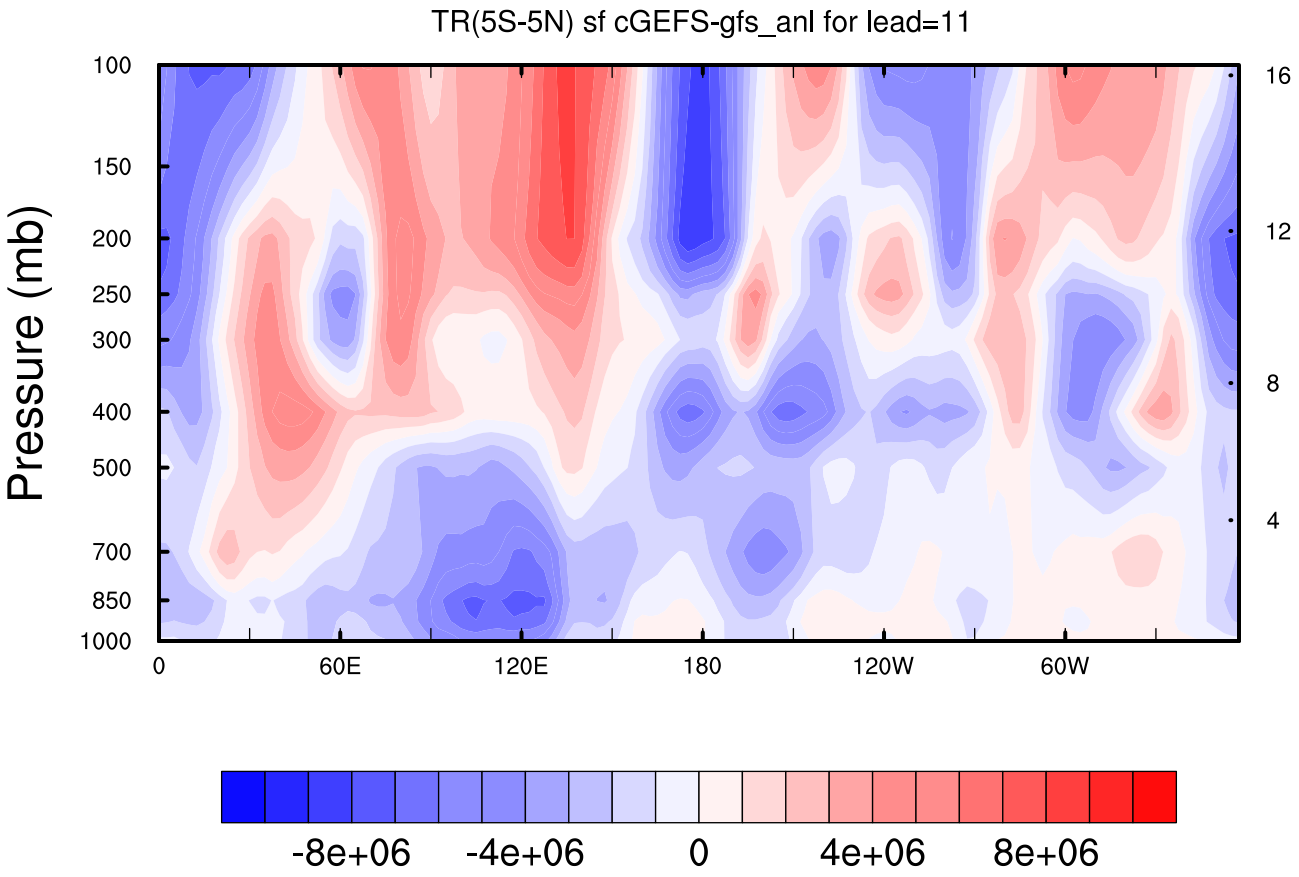

vp 200hPa cGEFS-gfs_anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

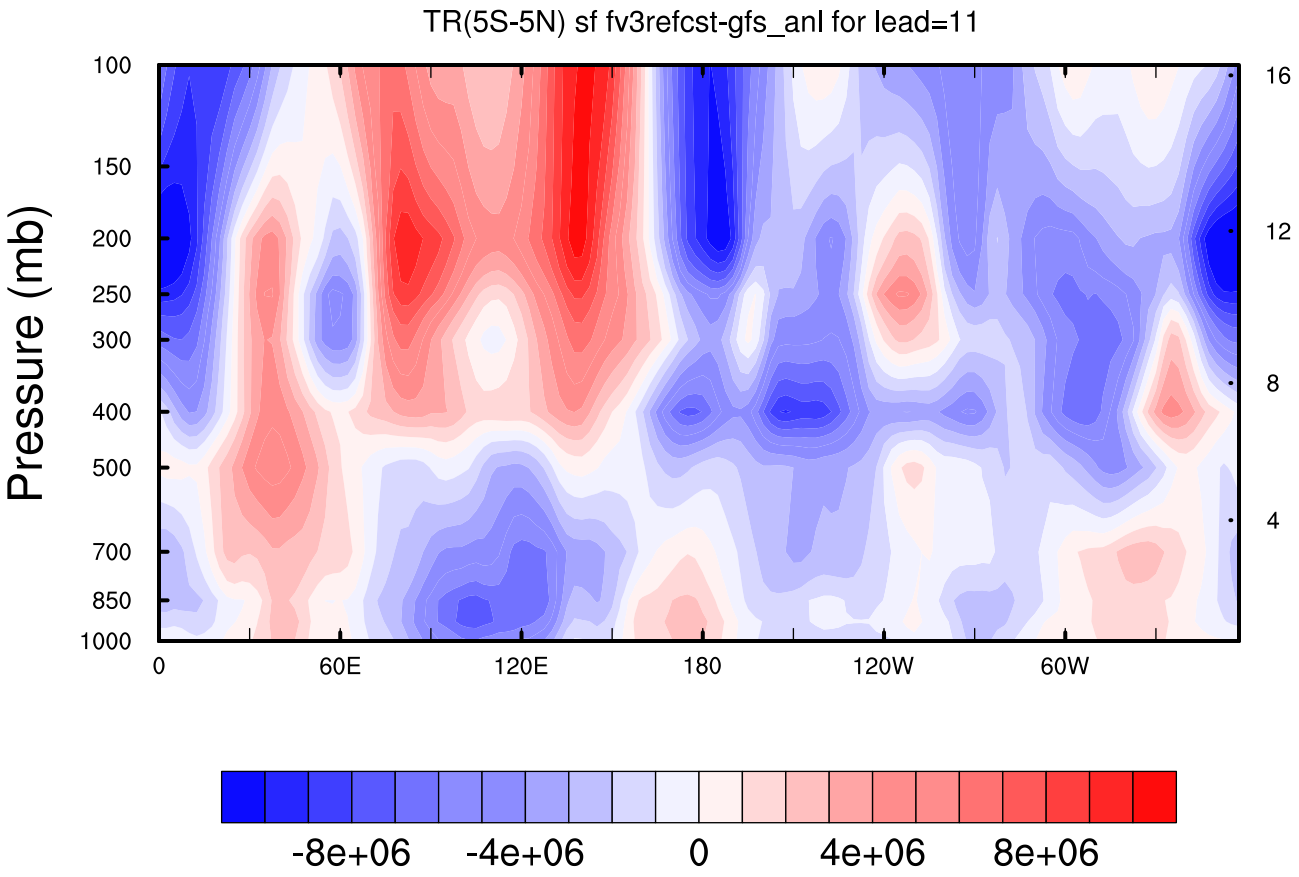

vp 200hPa fv3refcst-gfs_anl for lead=11
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

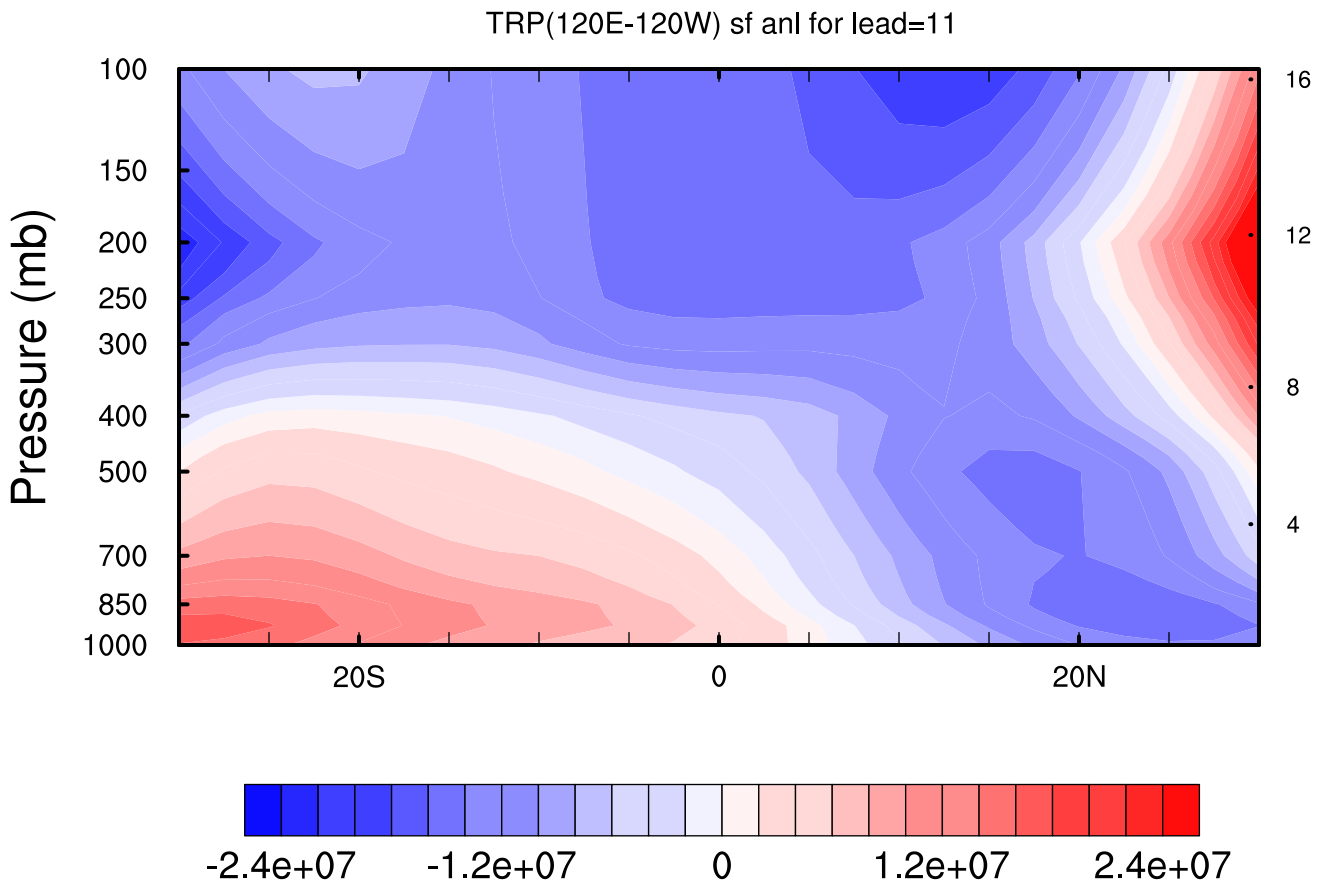

TR(5S-5N) sf anl for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

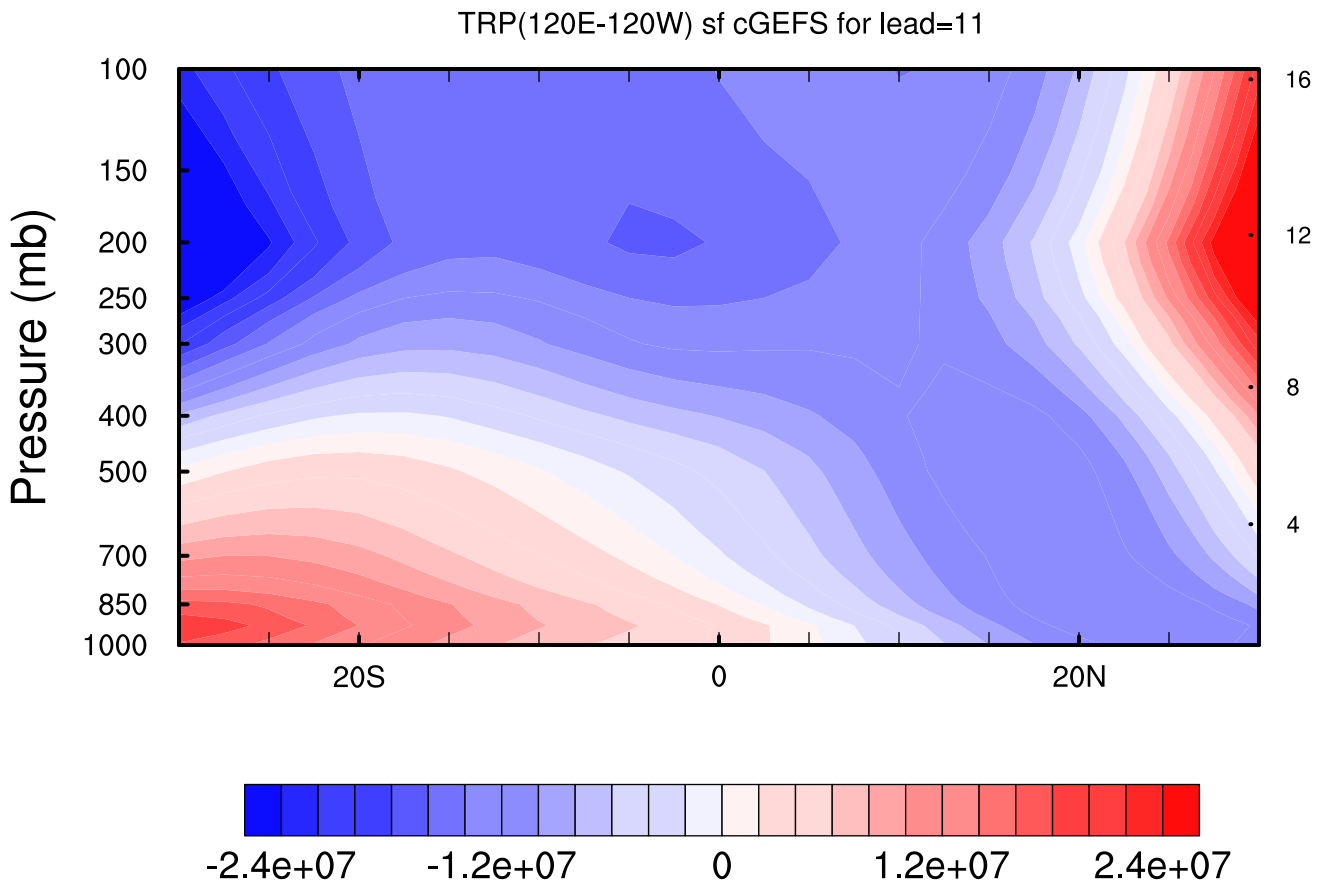

TR(5S-5N) sf cGEFS for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

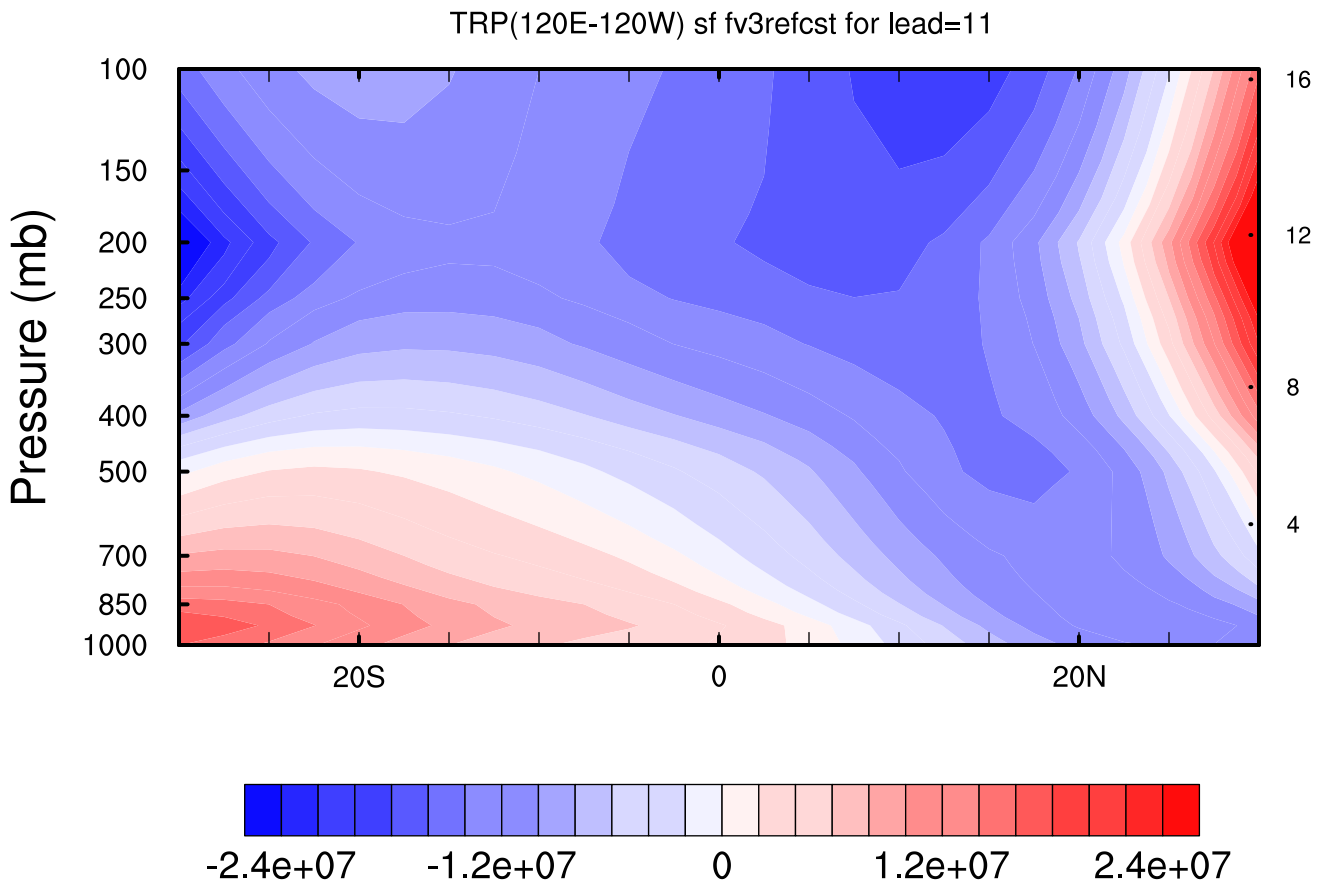

TR(5S-5N) sf fv3refcst for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

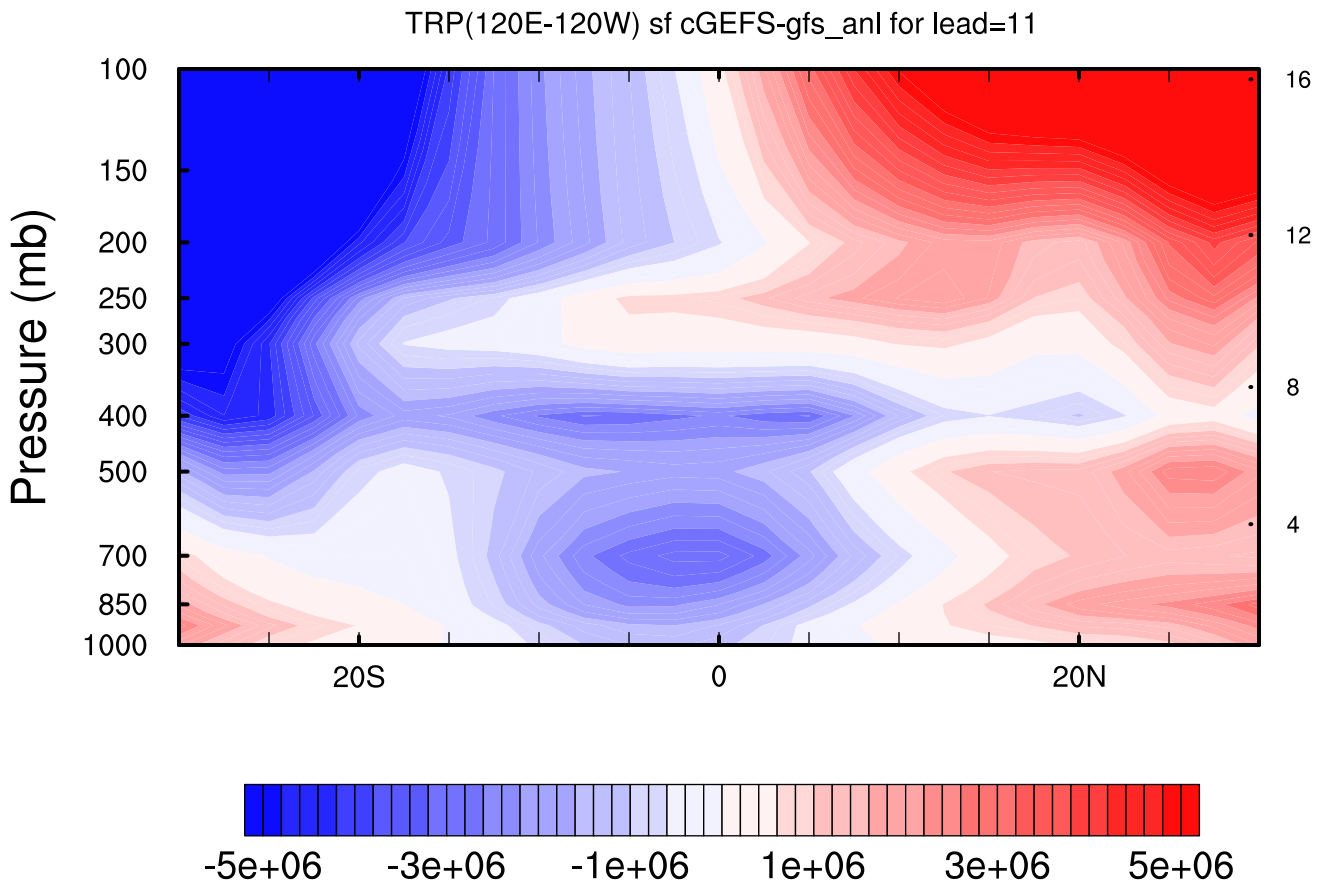

TR(5S-5N) sf cGEFS-gfs_anl for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

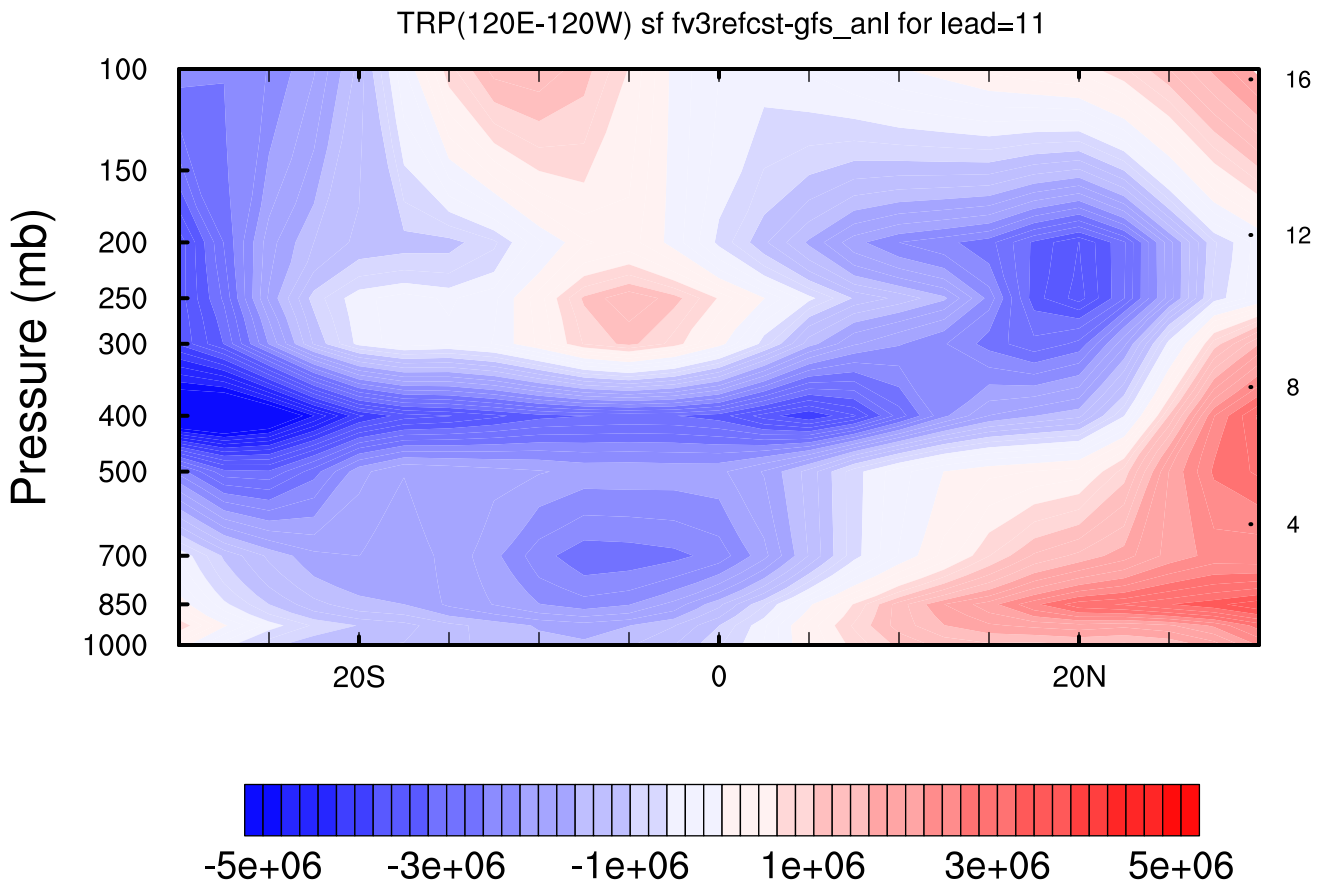

TR(5S-5N) sf fv3refcst-gfs_anl for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

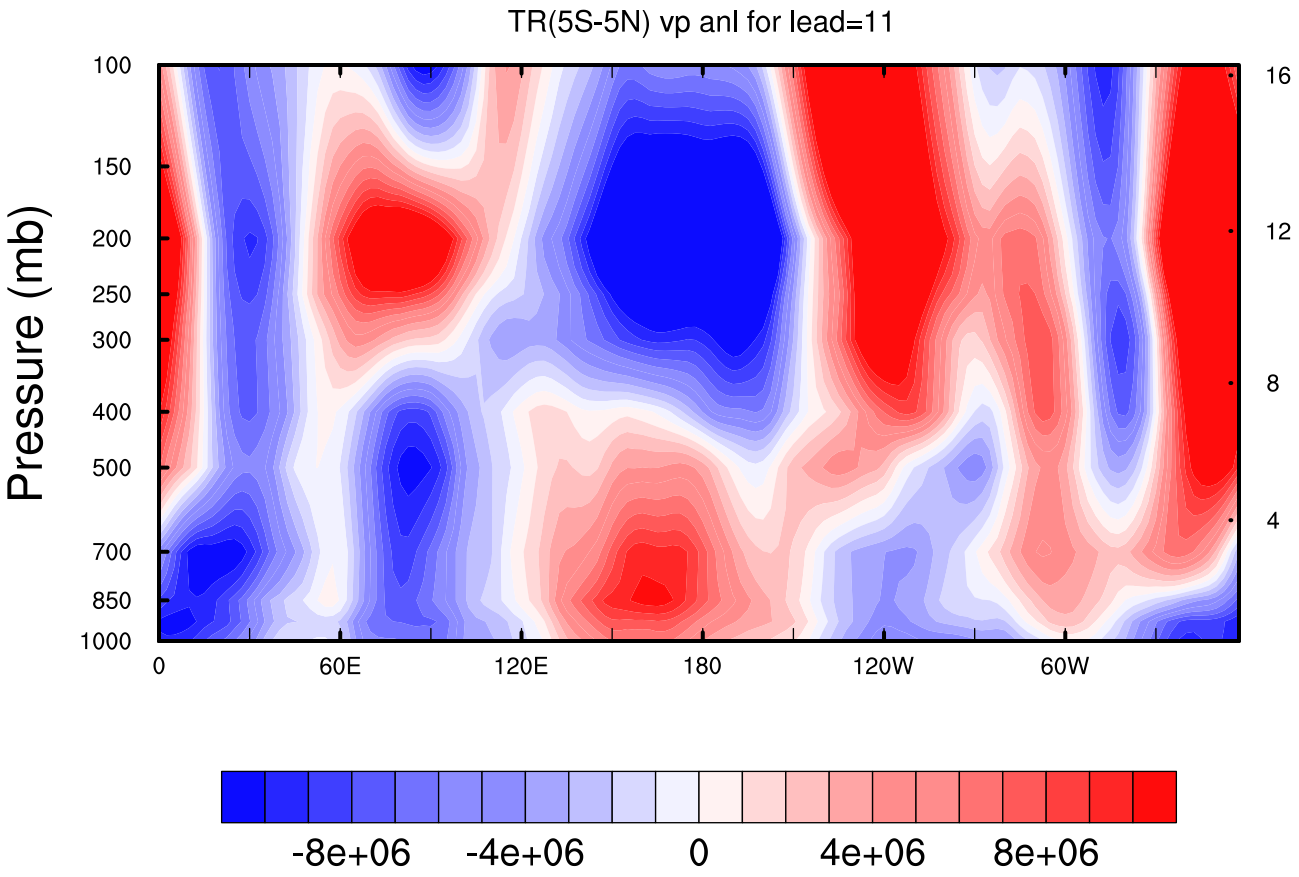

TRP(120E-120W) sf anl for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

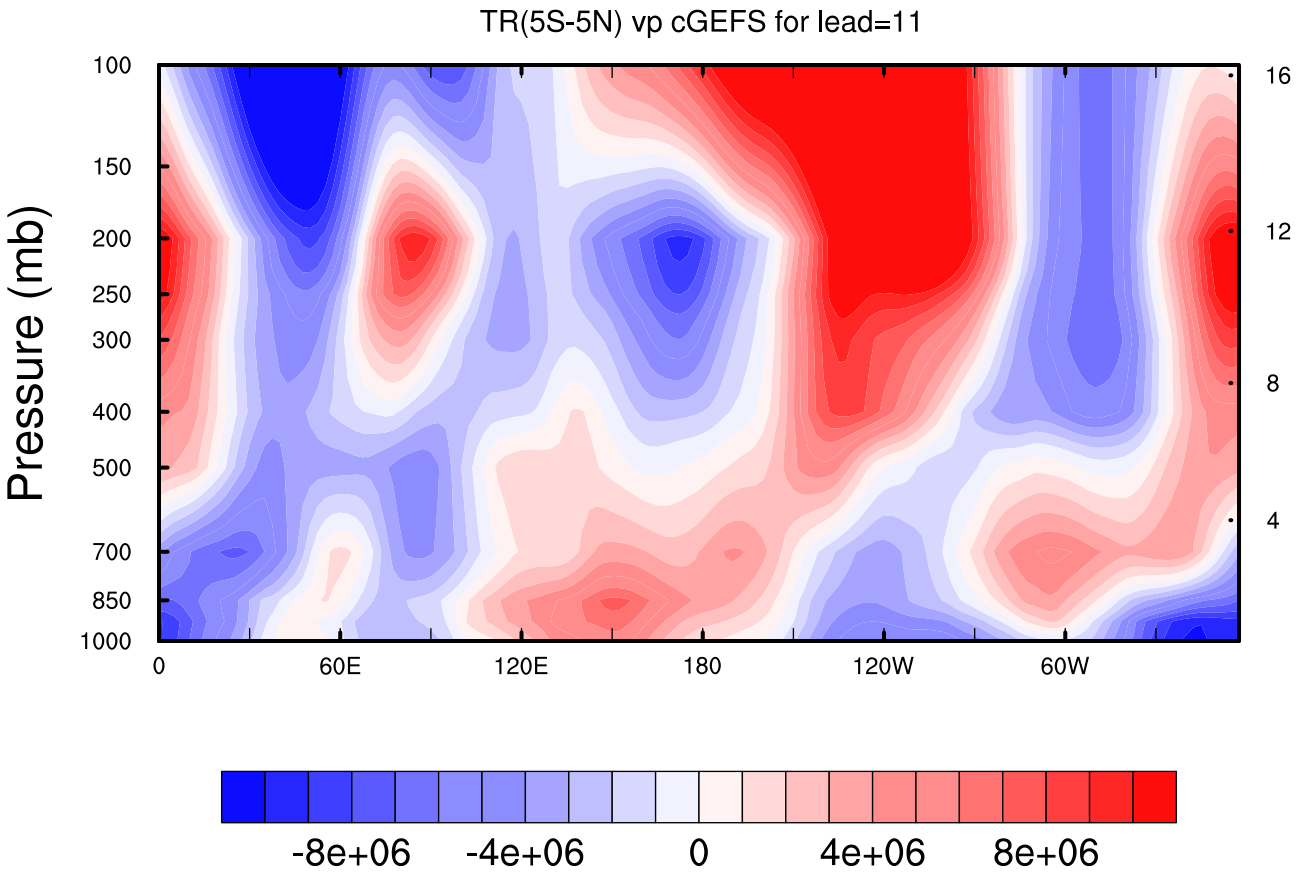

TRP(120E-120W) sf cGEFS for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

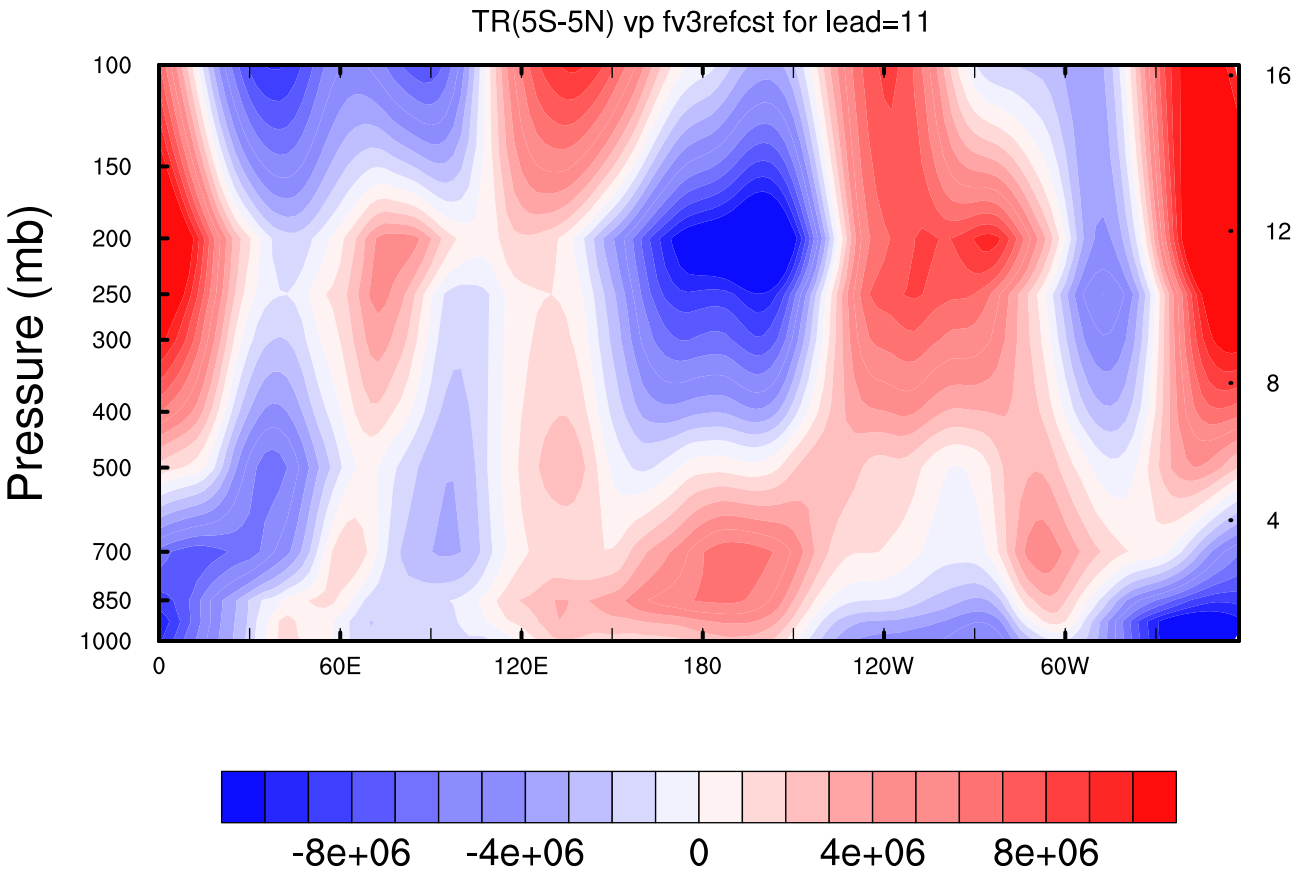

TRP(120E-120W) sf fv3refcst for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

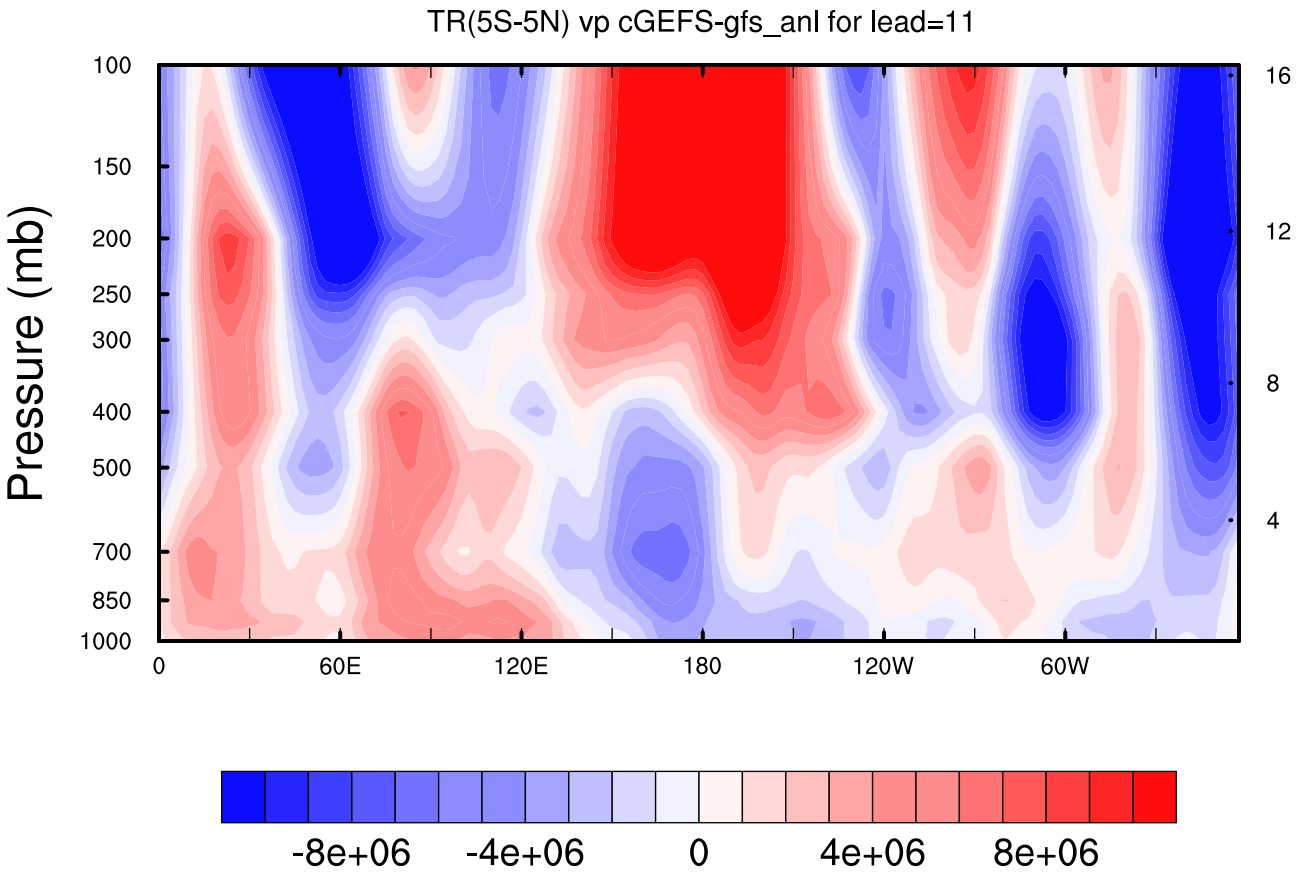

TRP(120E-120W) sf cGEFS-gfs_anl for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

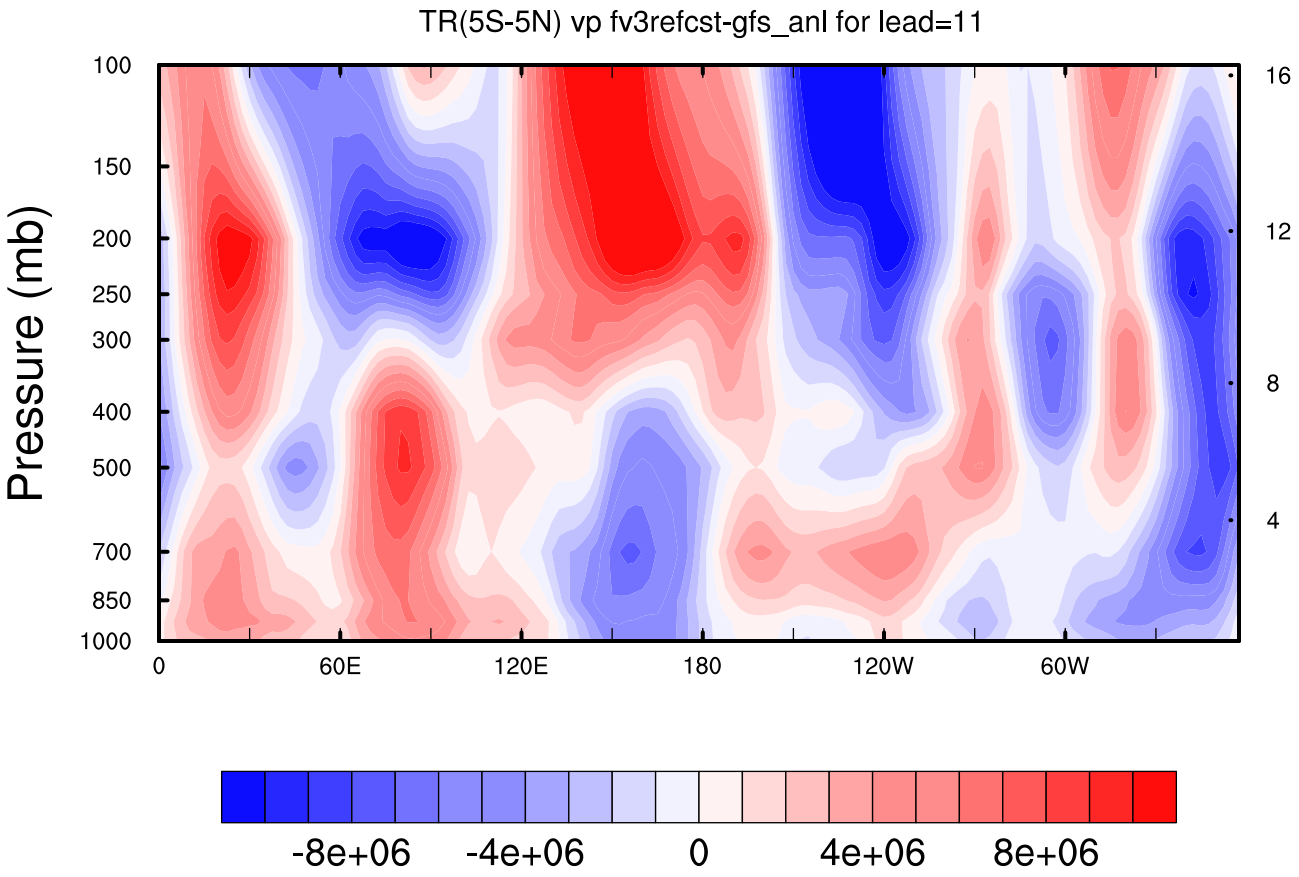

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

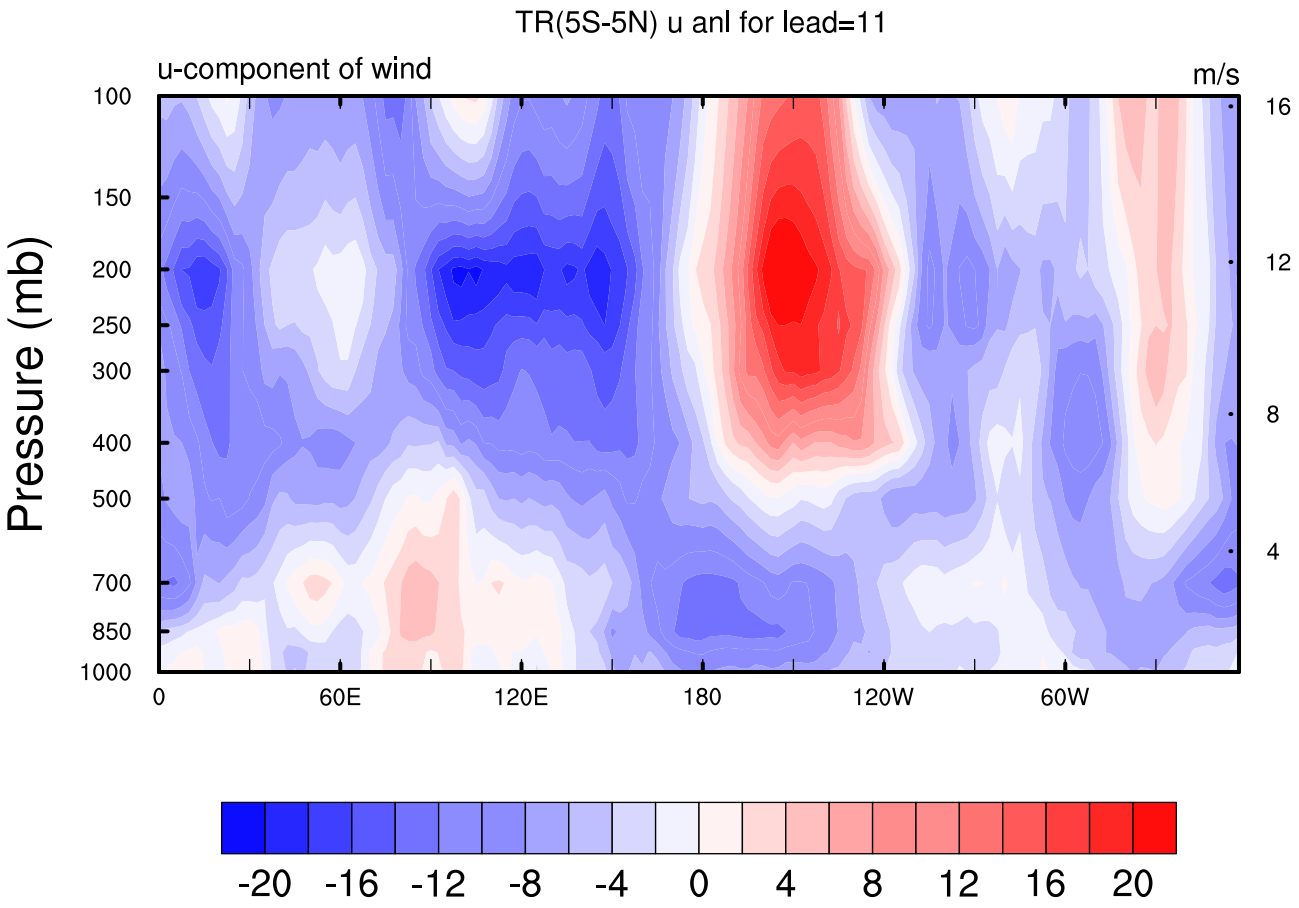

TR(5S-5N) vp anl for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS-gfs_anl for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst-gfs_anl for lead=11
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) u anl for lead=11
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
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-20
-16
-12
-8
-4
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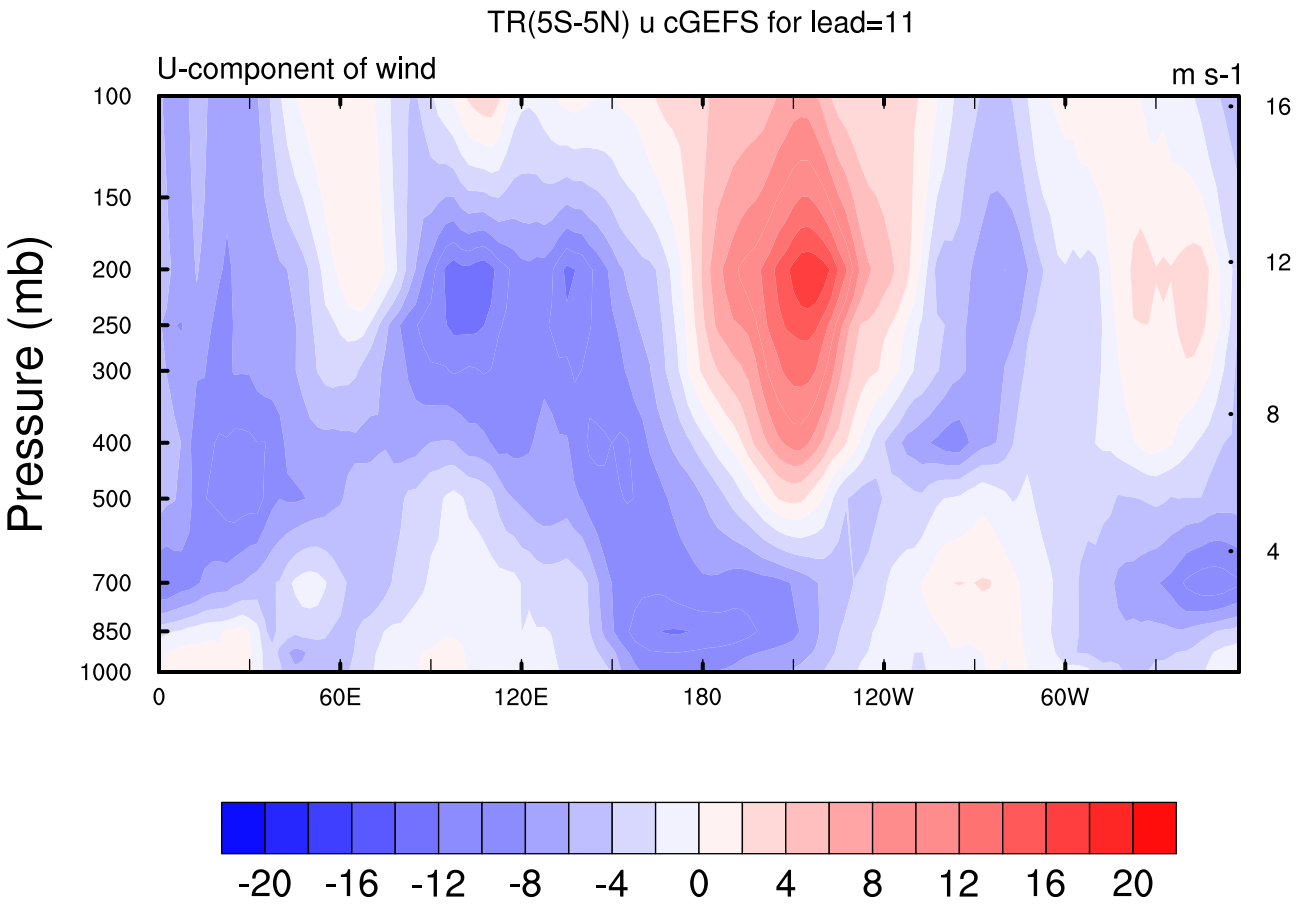
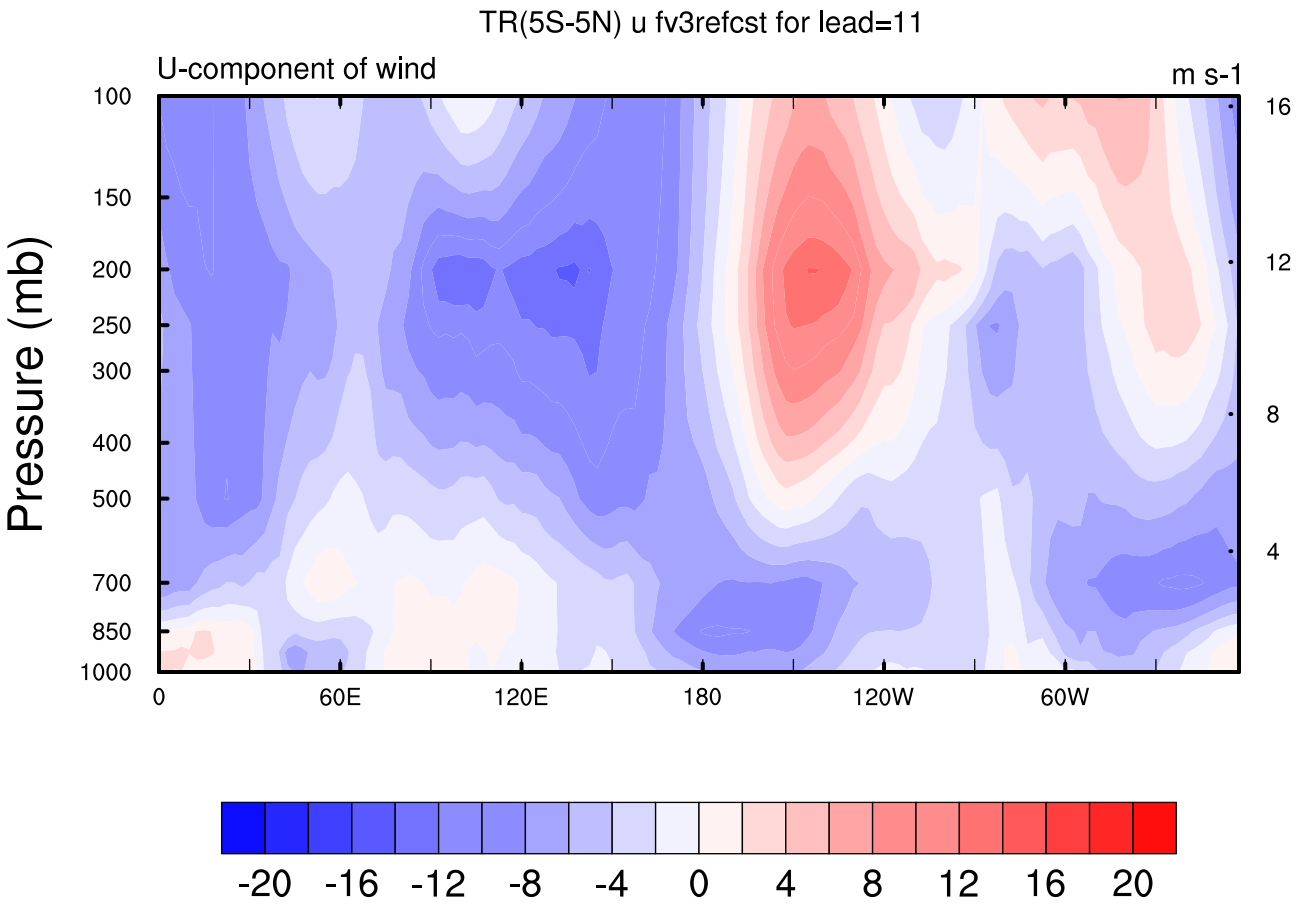
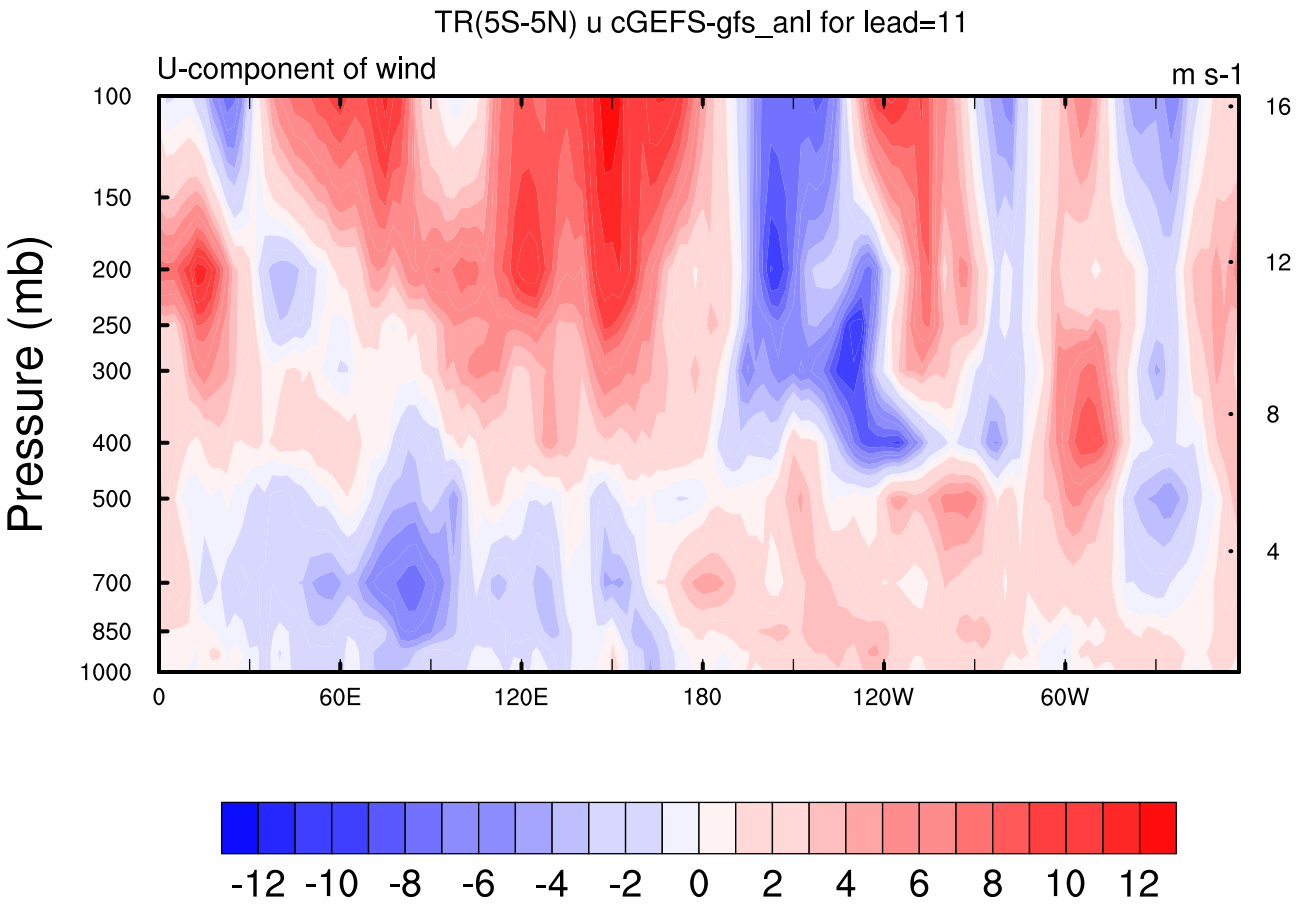
16
20


TR(5S-5N) u cGEFS for lead=11
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u fv3refcst for lead=11
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=11
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
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60W
-12
-10
-8
-6
-4
-2
0
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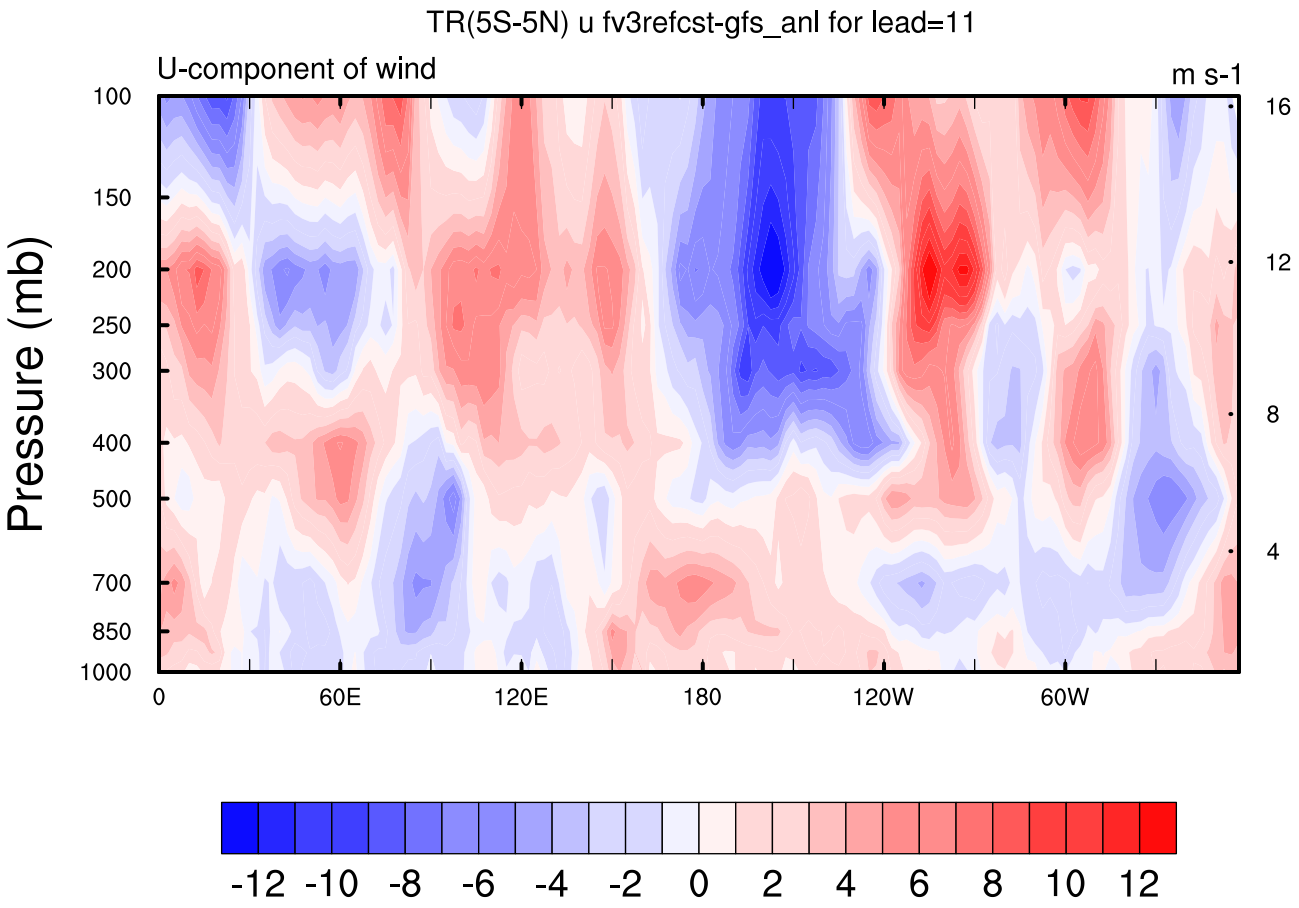
4
6
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=11
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
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4
-12
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-8
-6
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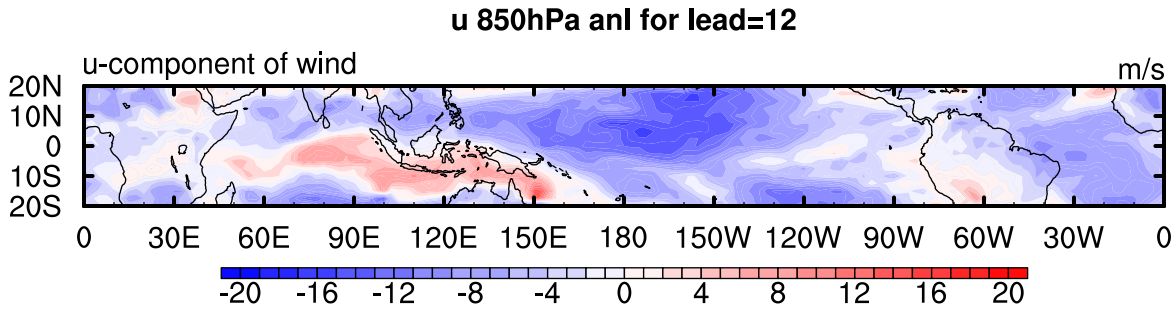
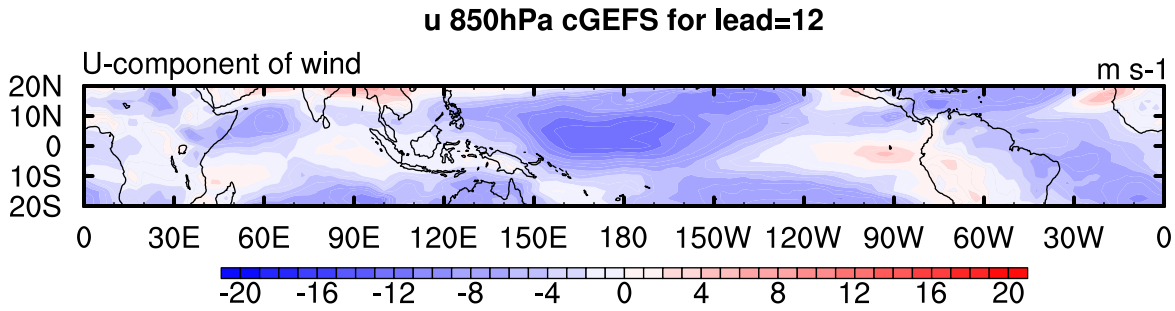
-2
0
2
4
6
8
10
12


u 850hPa anl for lead=12
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS for lead=12
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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30W
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-20
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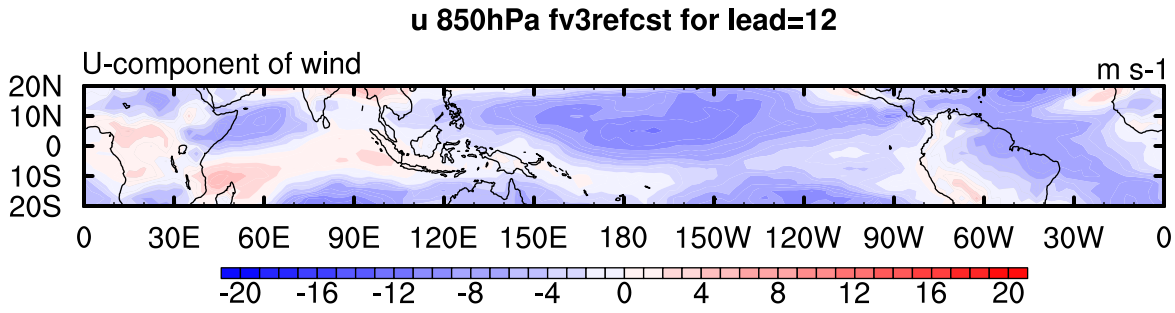
-12
-8
-4
0
4
8
12
16
20


u 850hPa fv3refcst for lead=12
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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60W
30W
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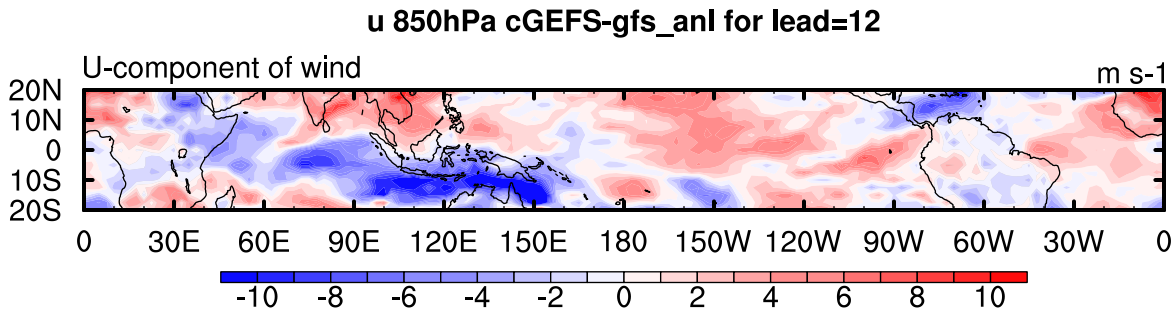
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=12
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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60W
30W
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-6
-4
-2
0
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8
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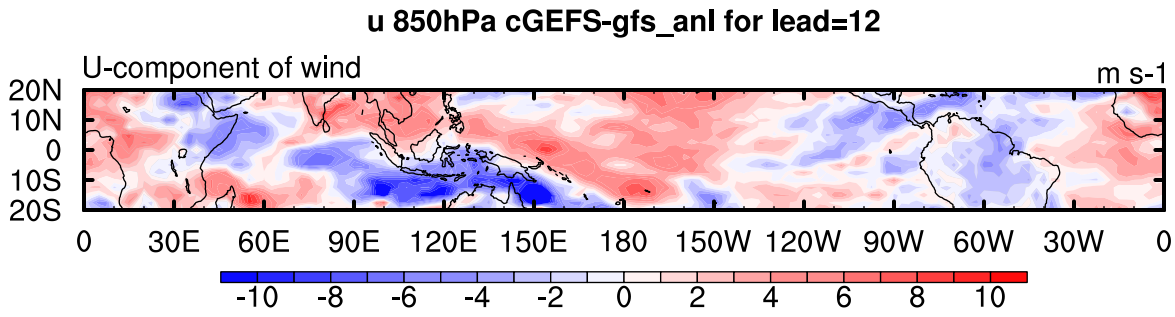
u 850hPa cGEFS-gfs_anl for lead=12
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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-4
-2
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8
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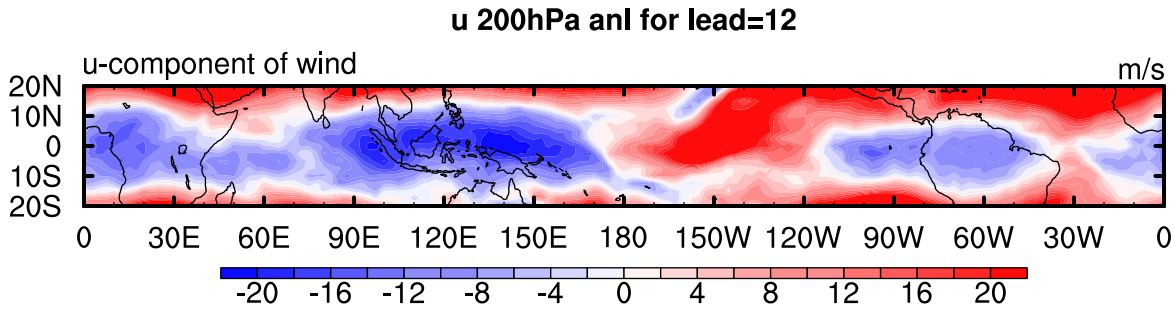
u 200hPa anl for lead=12
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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60W
30W
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-20
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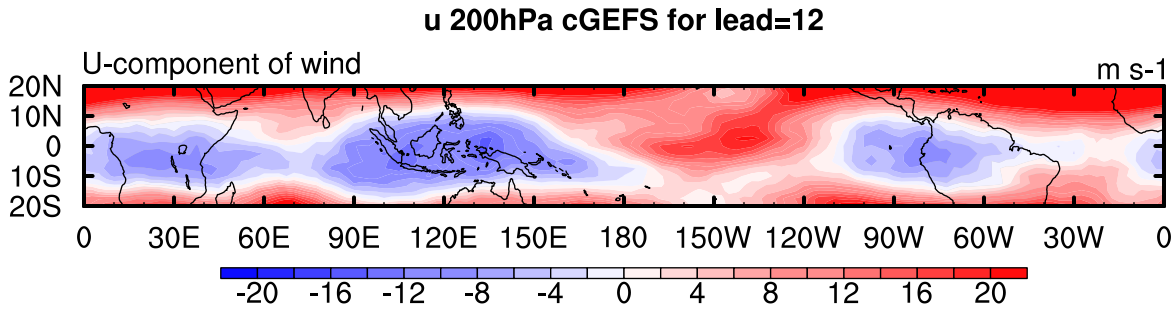
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=12
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-20
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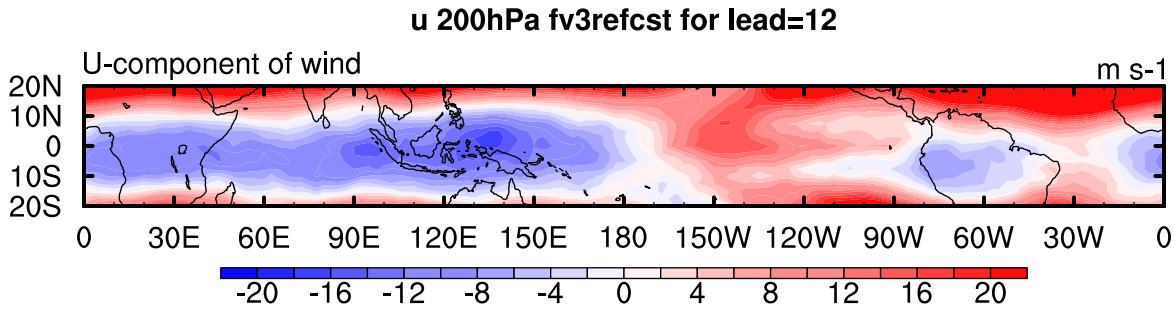
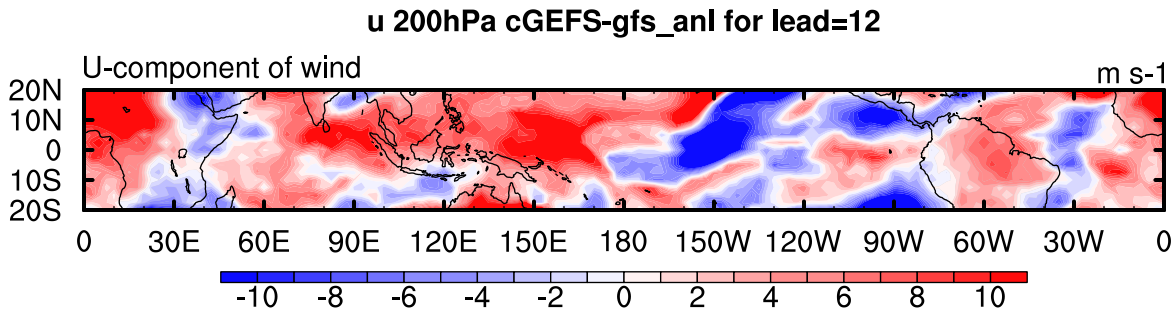
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=12
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=12
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-2
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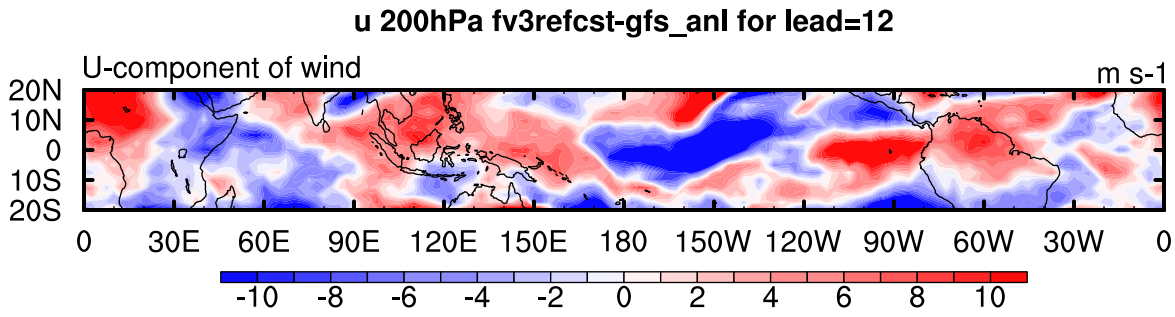
u 200hPa fv3refcst-gfs_anl for lead=12
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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-2
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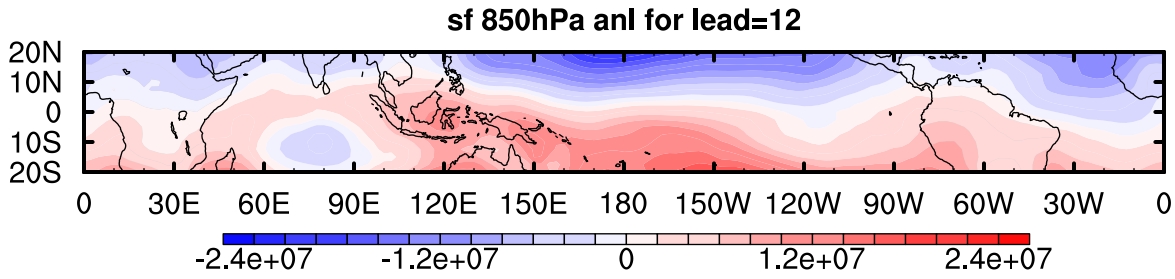
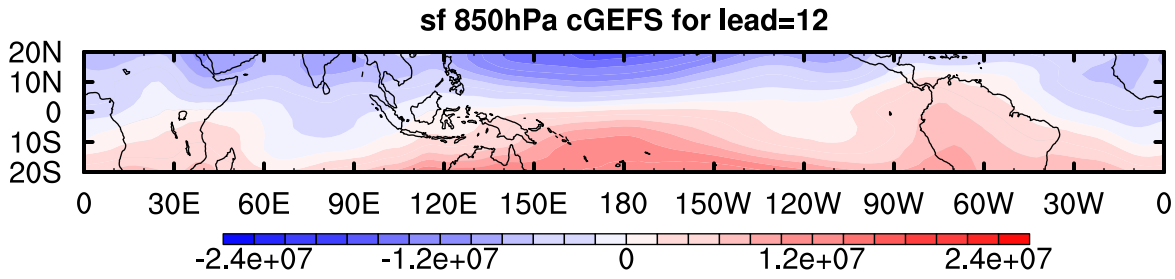

sf 850hPa anl for lead=12
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=12
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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30W
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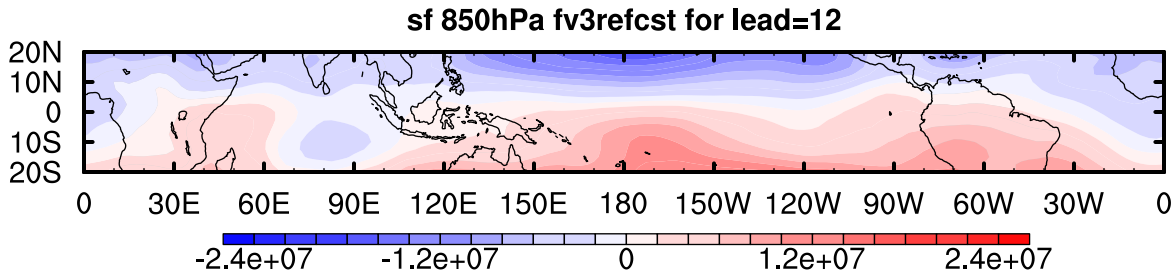
-1.2e+07
0
1.2e+07
2.4e+07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20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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30W
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0
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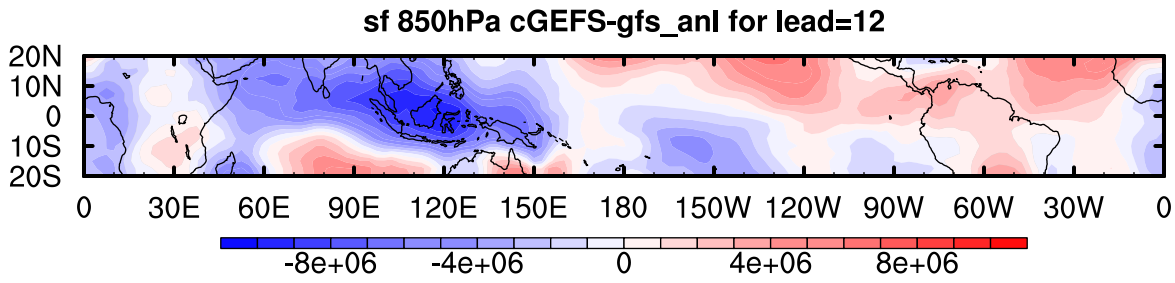
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=12
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10N
0
10S
20S
0
30E
60E
90E
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30W
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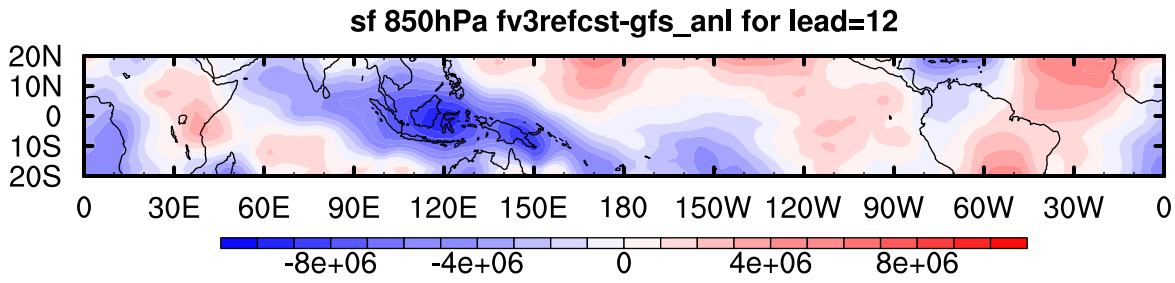
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=12
20N
10N
0
10S
20S
0
30E
60E
90E
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30W
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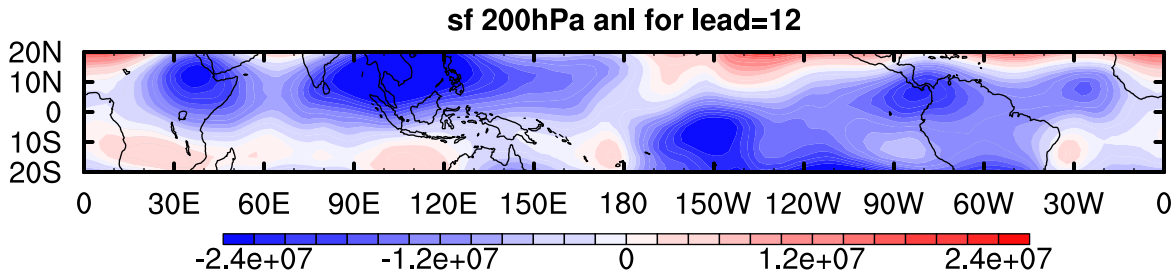
sf 200hPa anl for lead=12
20N
10N
0
10S
20S
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150E
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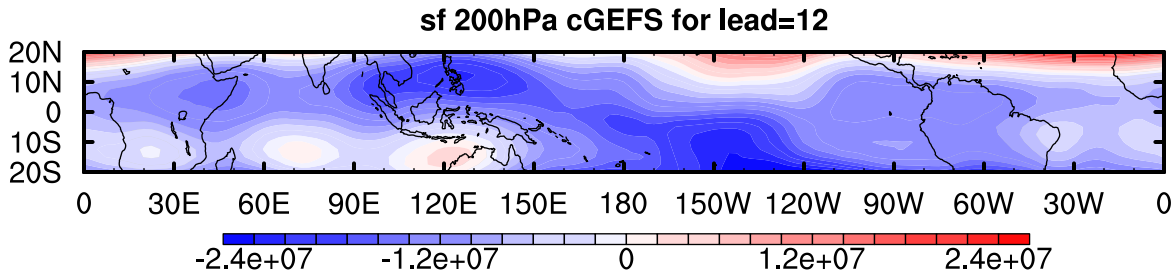
sf 200hPa cGEFS for lead=12
20N
10N
0
10S
20S
0
30E
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90E
120E
150E
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30W
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0
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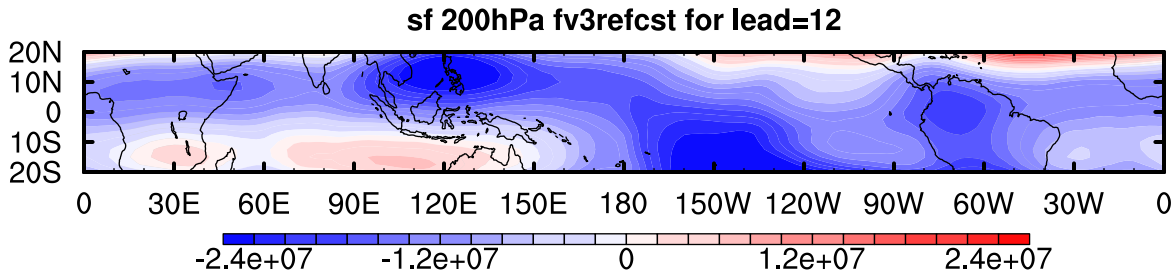
sf 200hPa fv3refcst for lead=12
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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120W
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30W
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0
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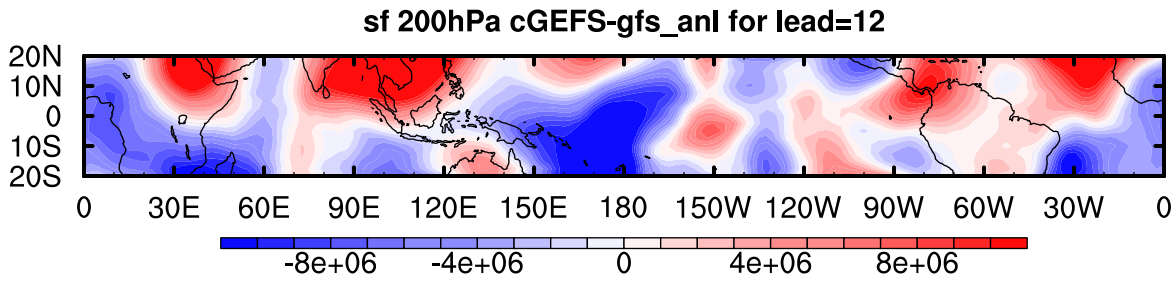
sf 200hPa cGEFS-gfs_anl for lead=12
20N
10N
0
10S
20S
0
30E
60E
90E
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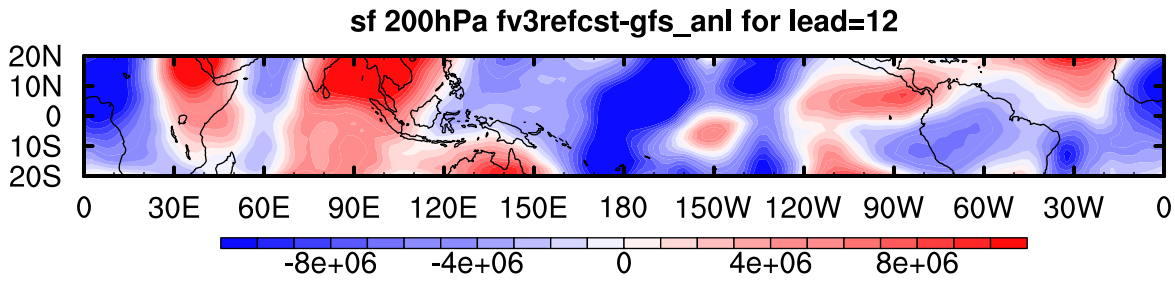
sf 200hPa fv3refcst-gfs_anl for lead=12
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10N
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10S
20S
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30E
60E
90E
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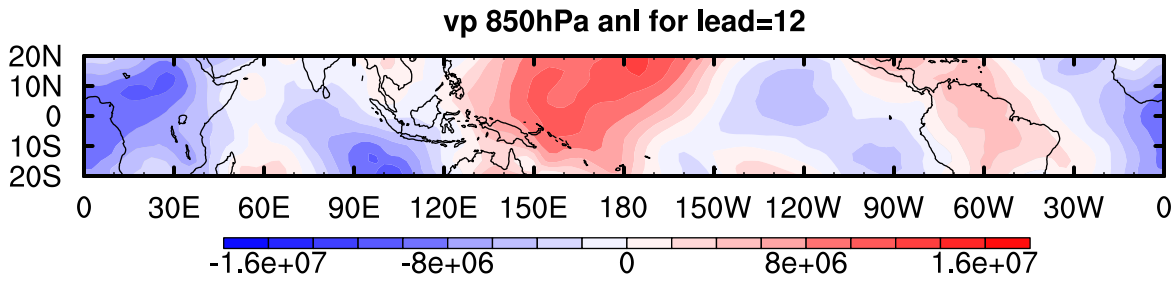
vp 850hPa anl for lead=12
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20S
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-8e+06
0
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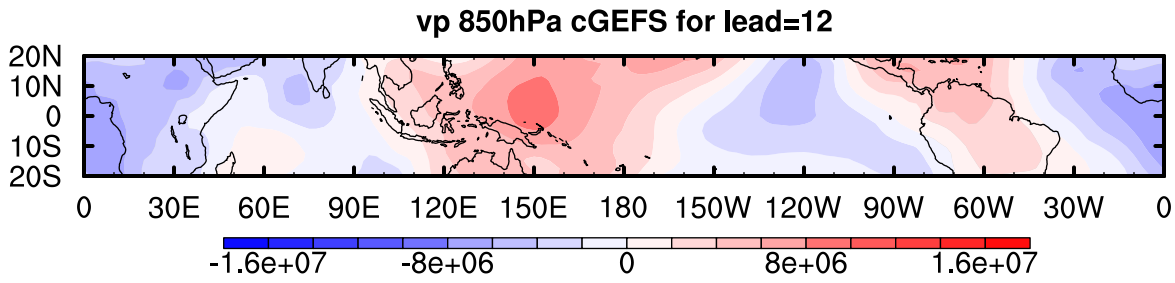
vp 850hPa cGEFS for lead=12
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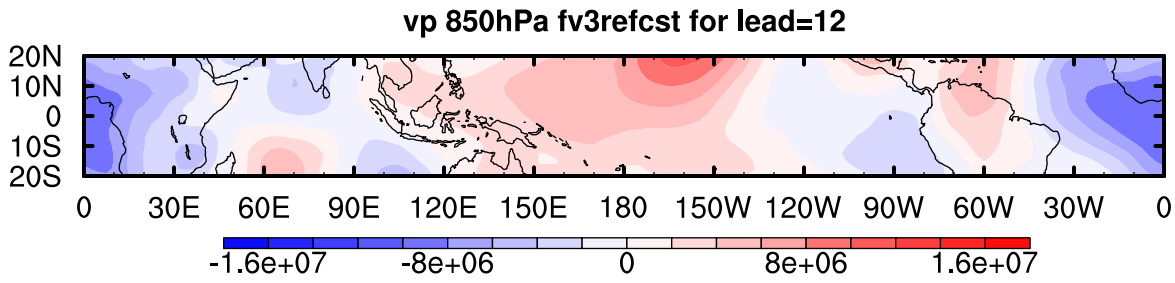
vp 850hPa fv3refcst for lead=12
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-8e+06
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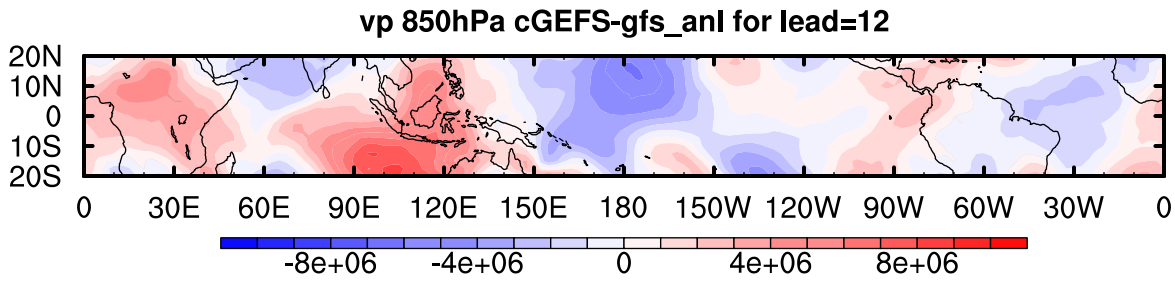
vp 850hPa cGEFS-gfs_anl for lead=12
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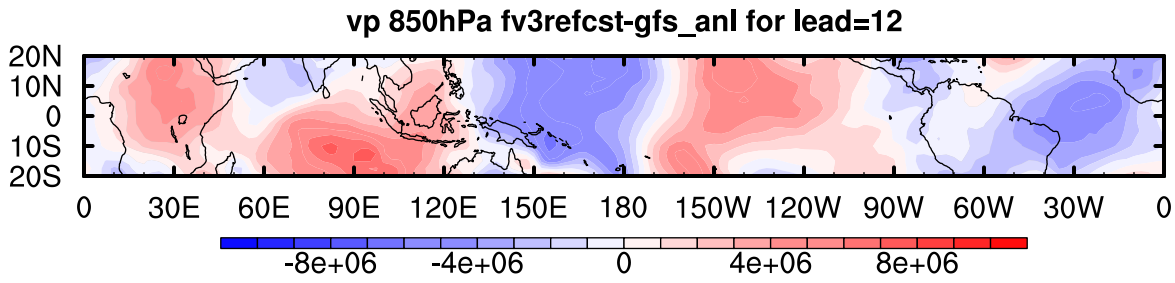
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=12
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10N
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10S
20S
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30W
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-4e+06
0
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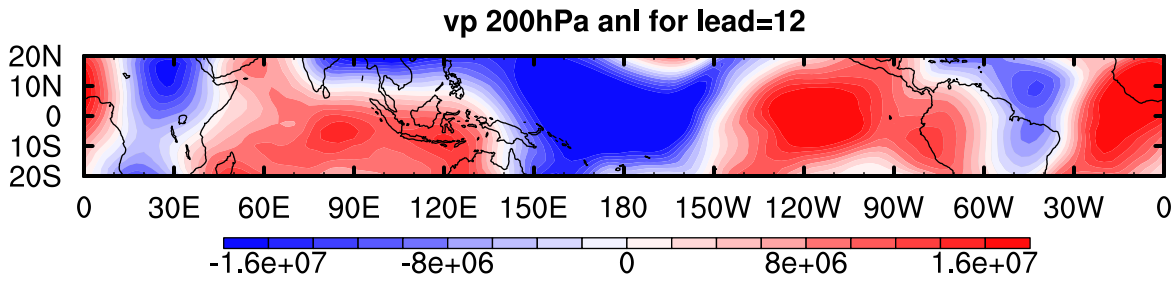
8e+06


vp 200hPa anl for lead=12
20N
10N
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10S
20S
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0
-1.6e+07
-8e+06
0
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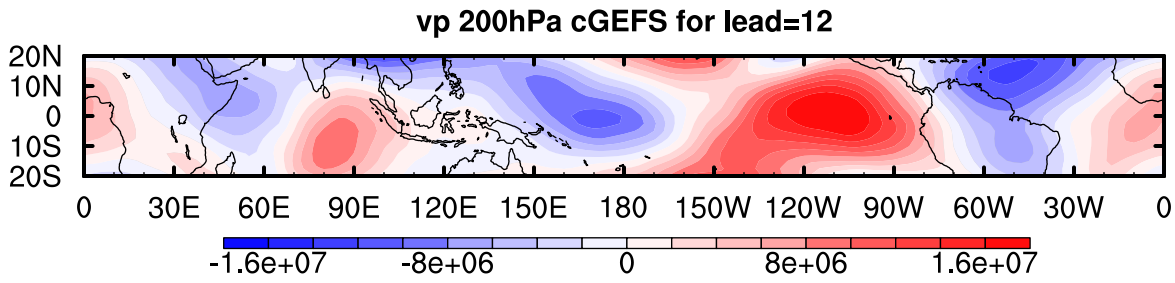
1.6e+07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10S
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-8e+06
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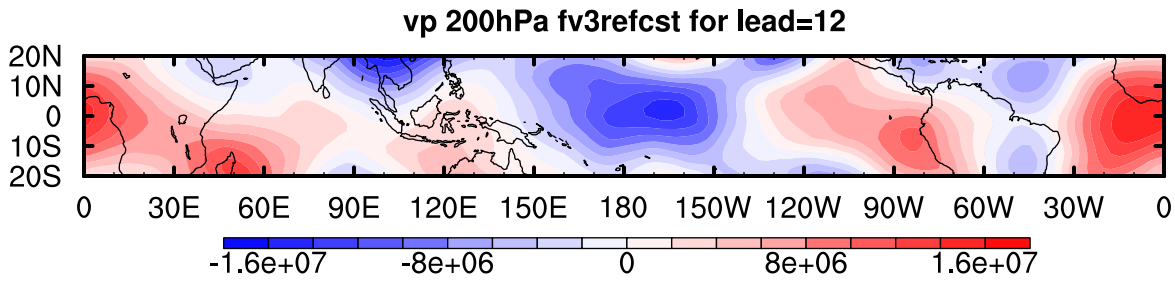
1.6e+07


vp 200hPa fv3refcst for lead=12
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10S
20S
0
30E
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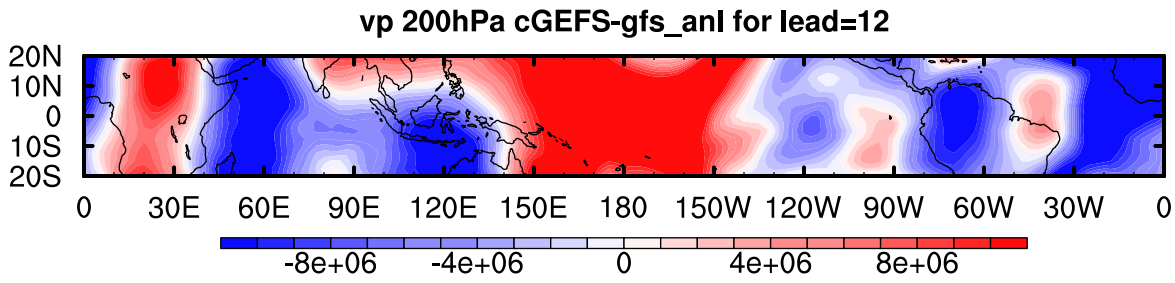
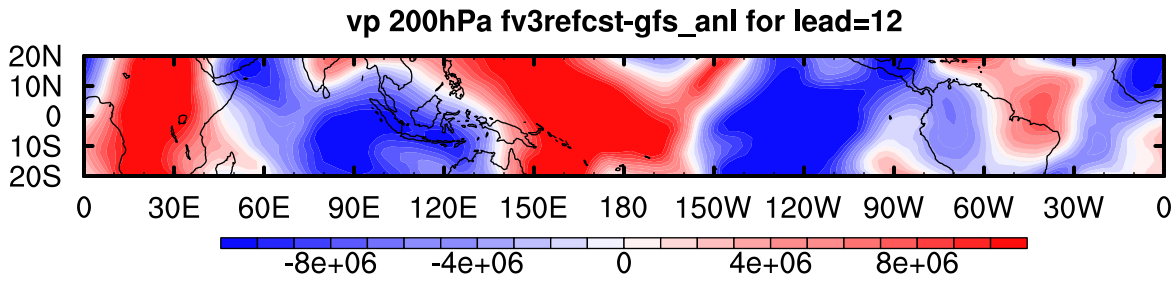
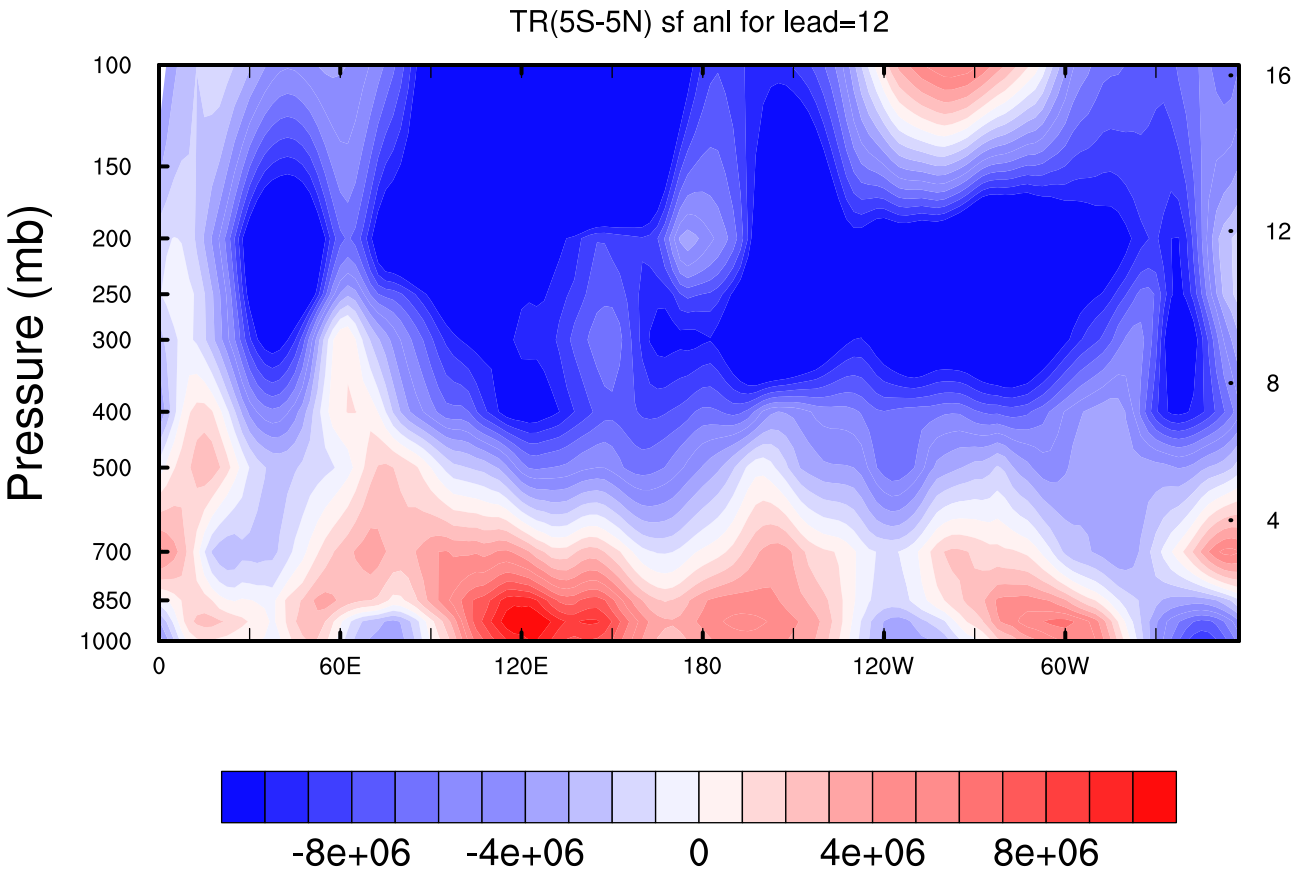
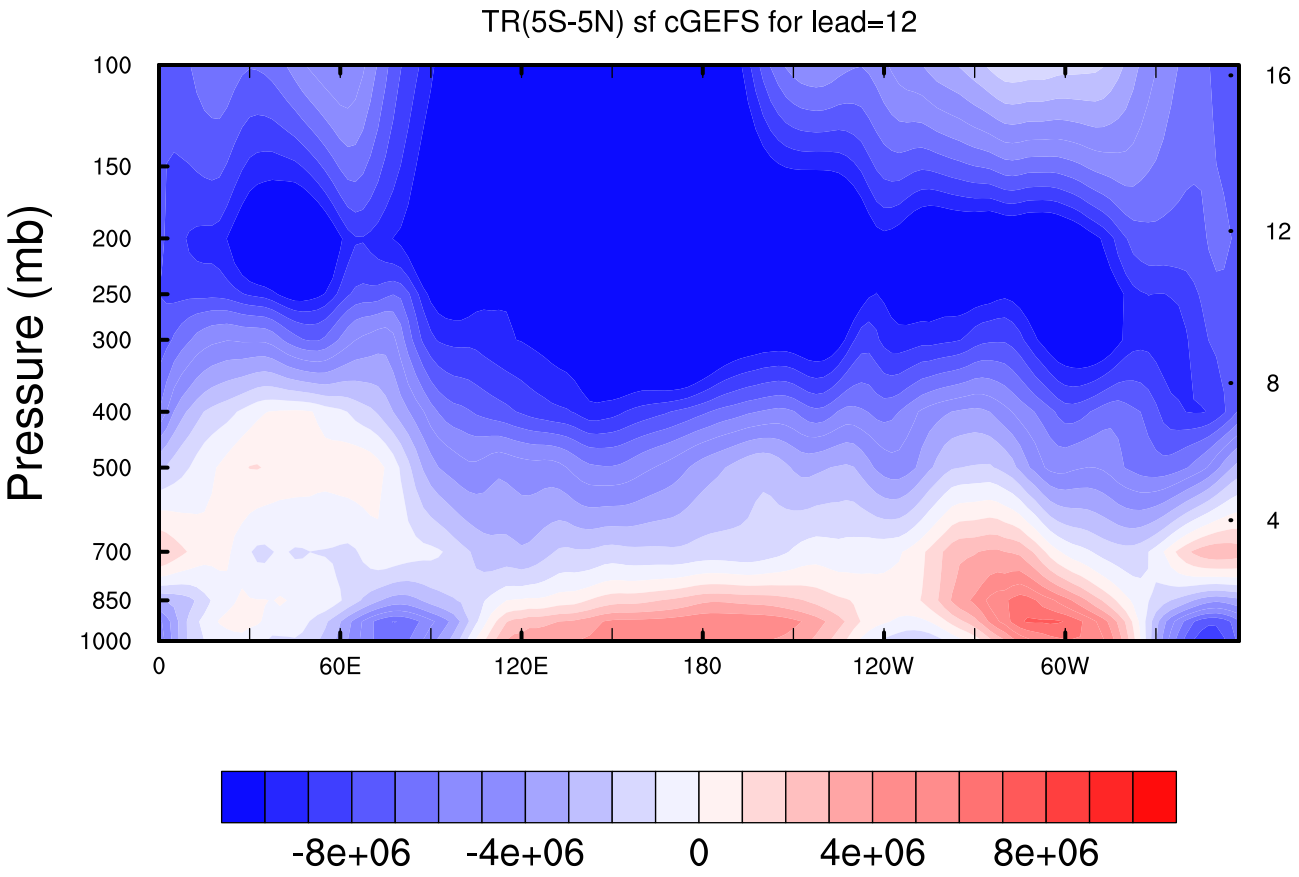
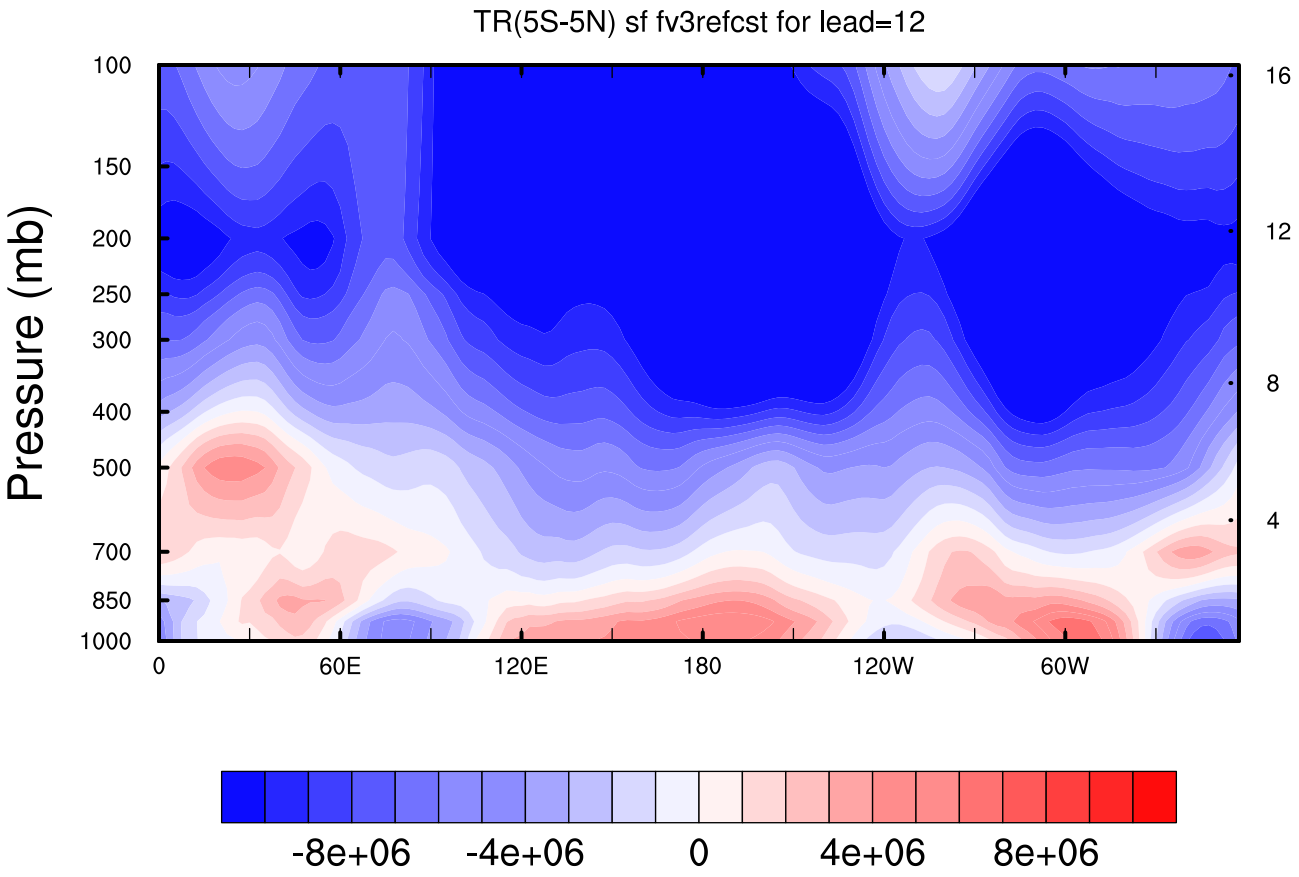
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

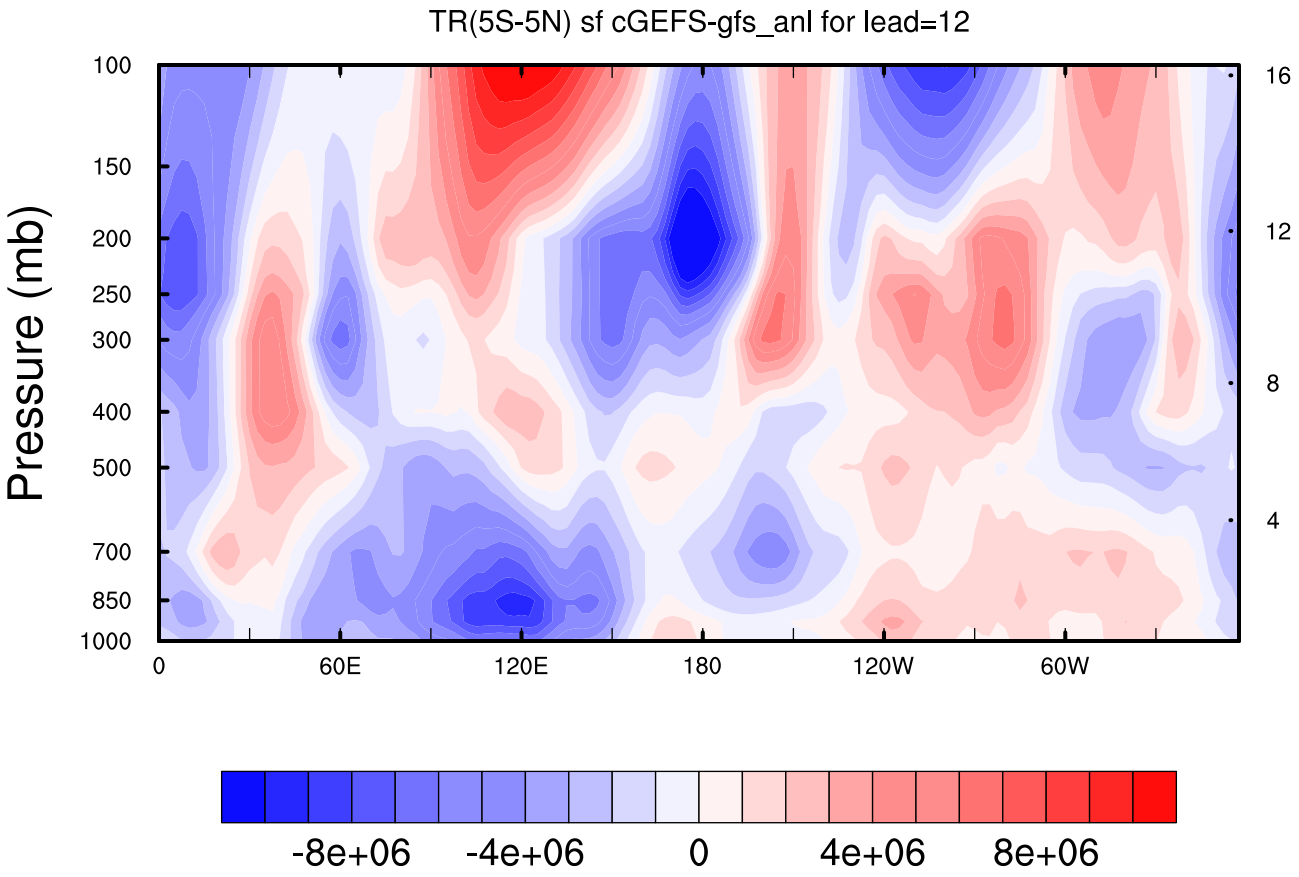

vp 200hPa cGEFS-gfs_anl for lead=12
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

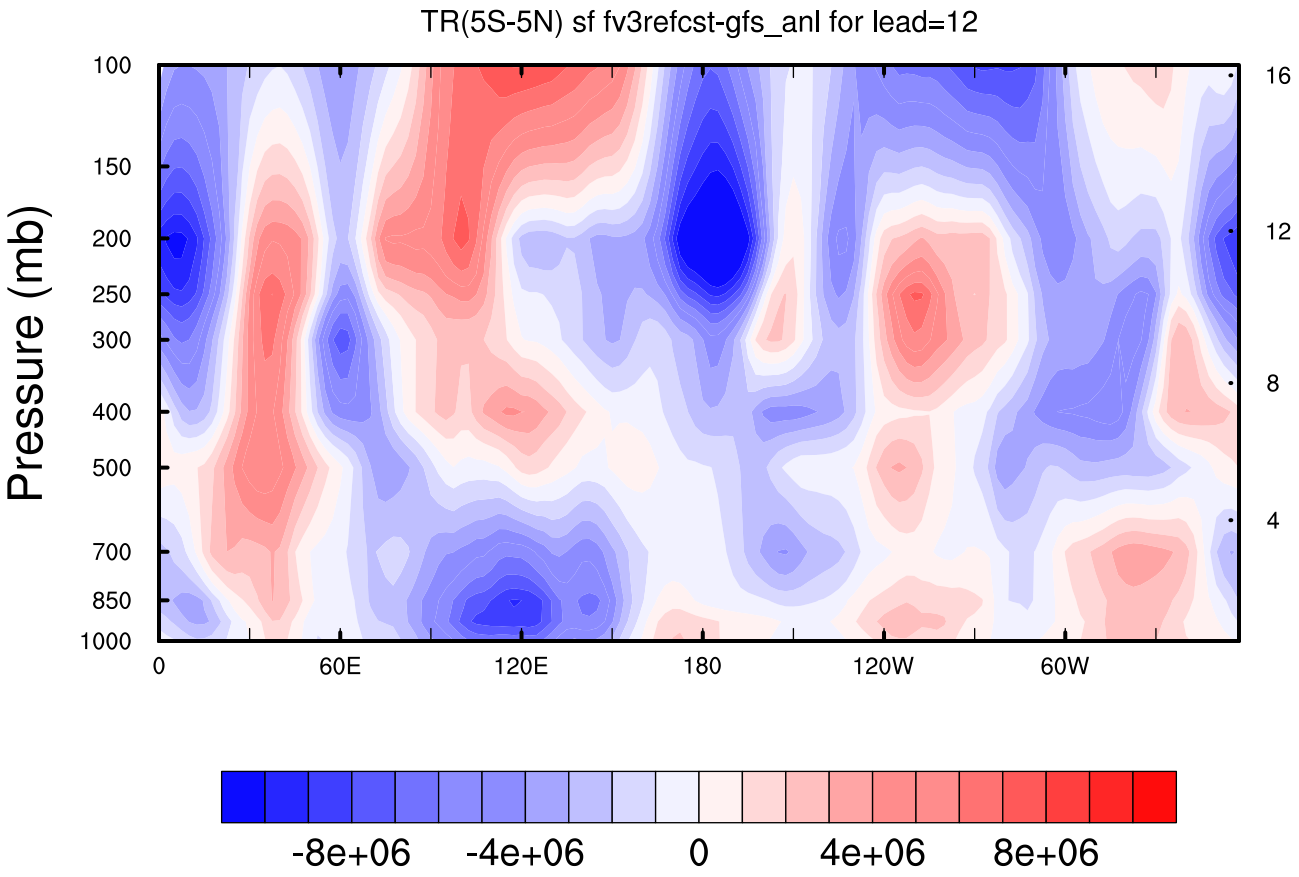

vp 200hPa fv3refcst-gfs_anl for lead=12
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

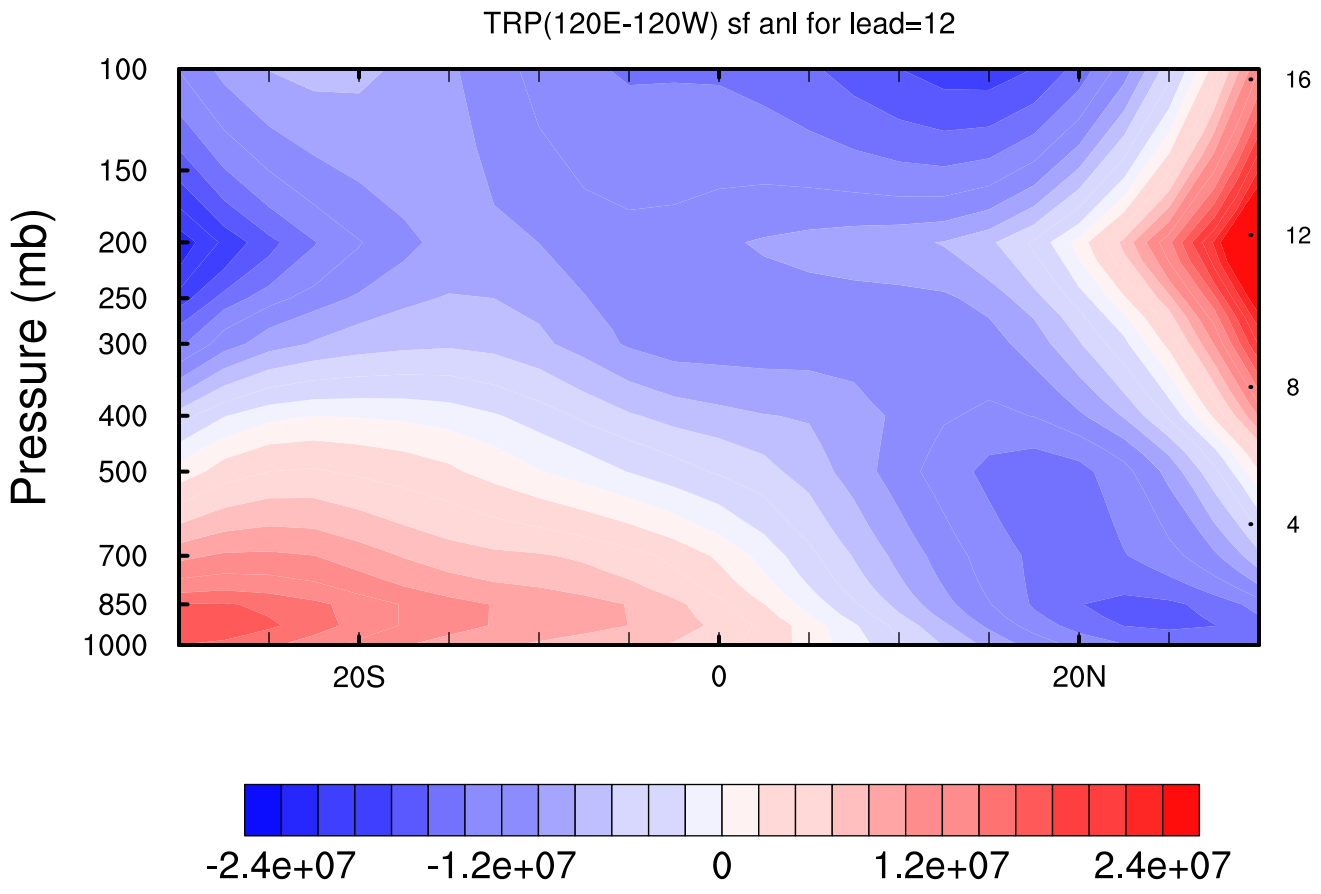

TR(5S-5N) sf anl for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

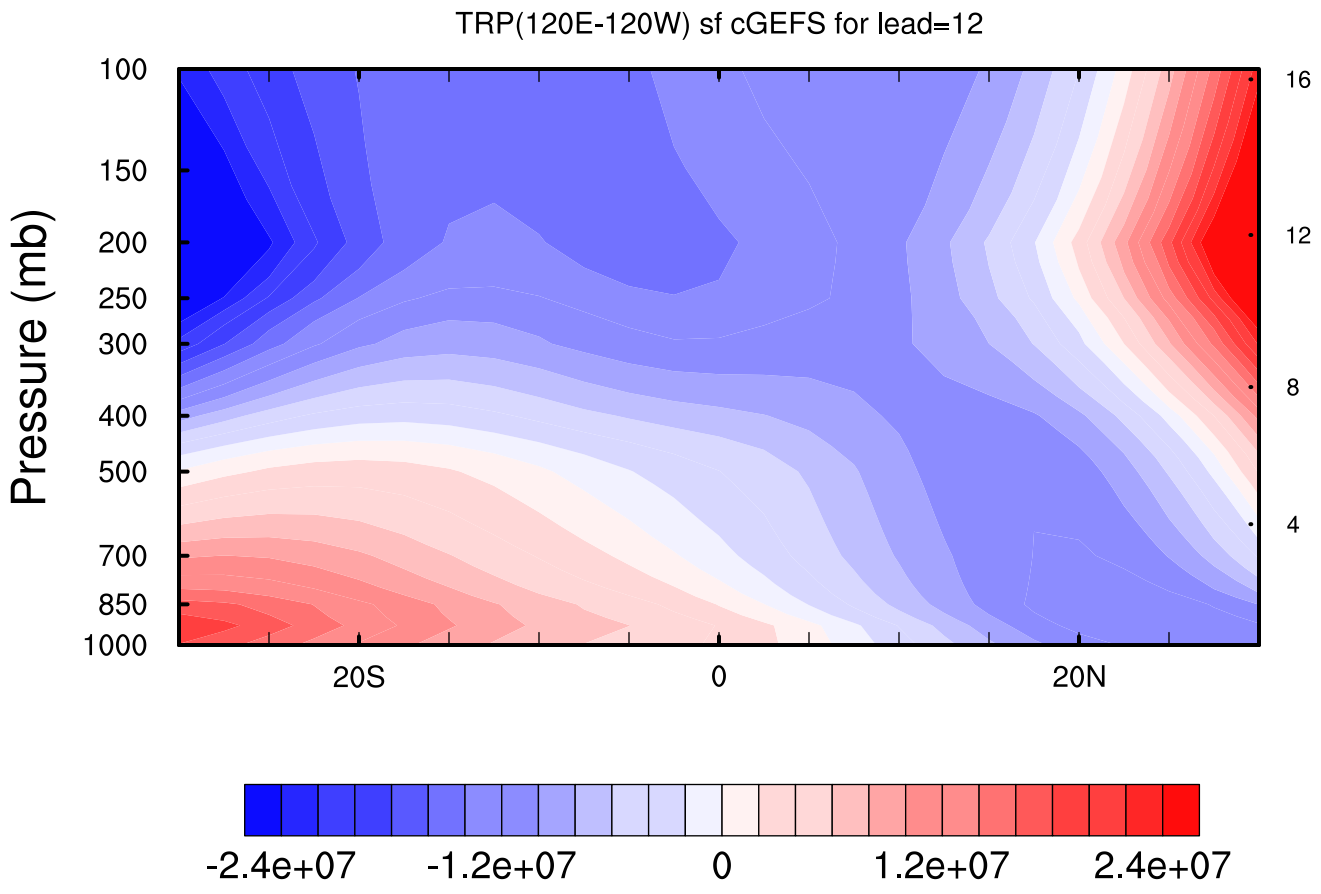

TR(5S-5N) sf cGEFS for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

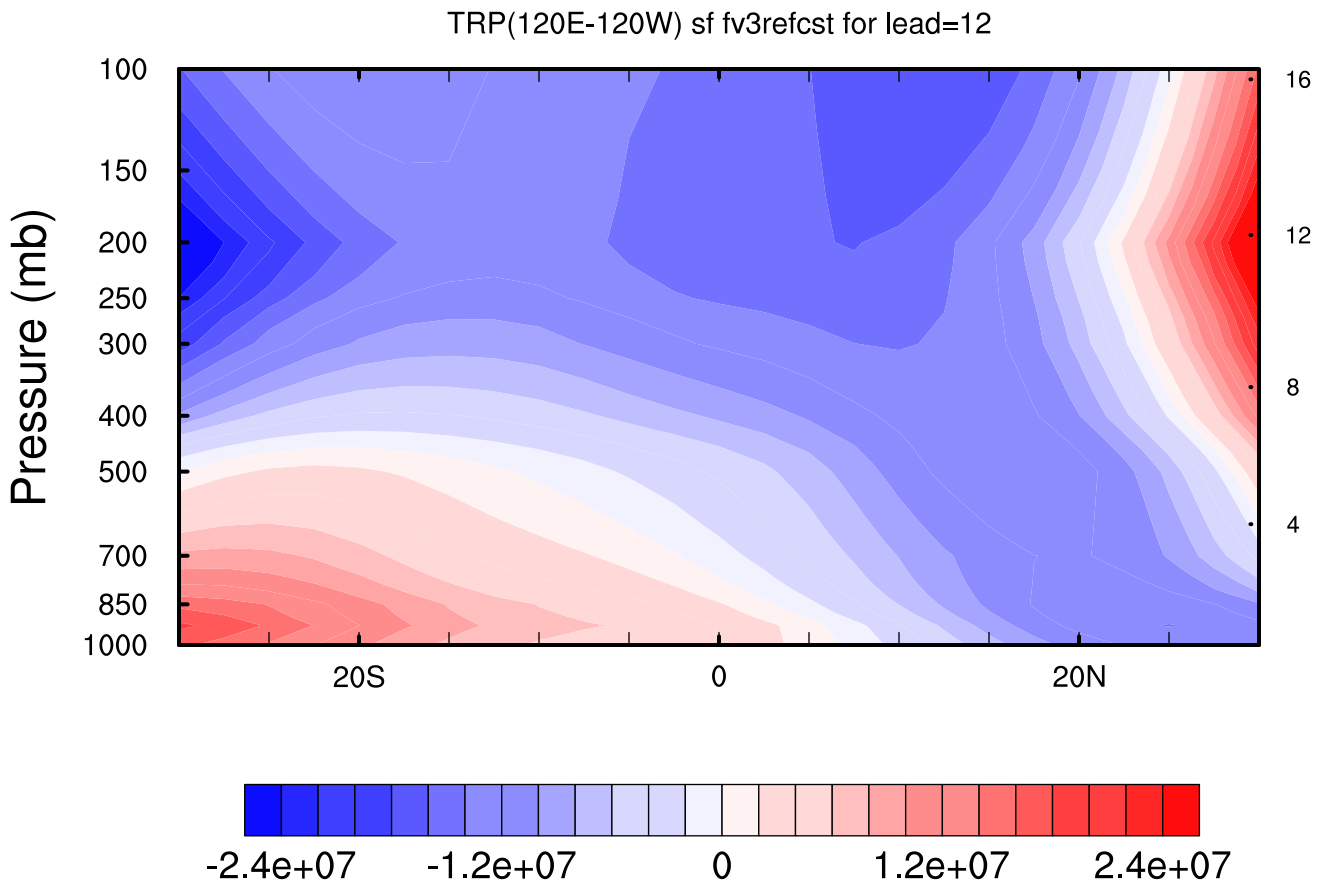

TR(5S-5N) sf fv3refcst for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

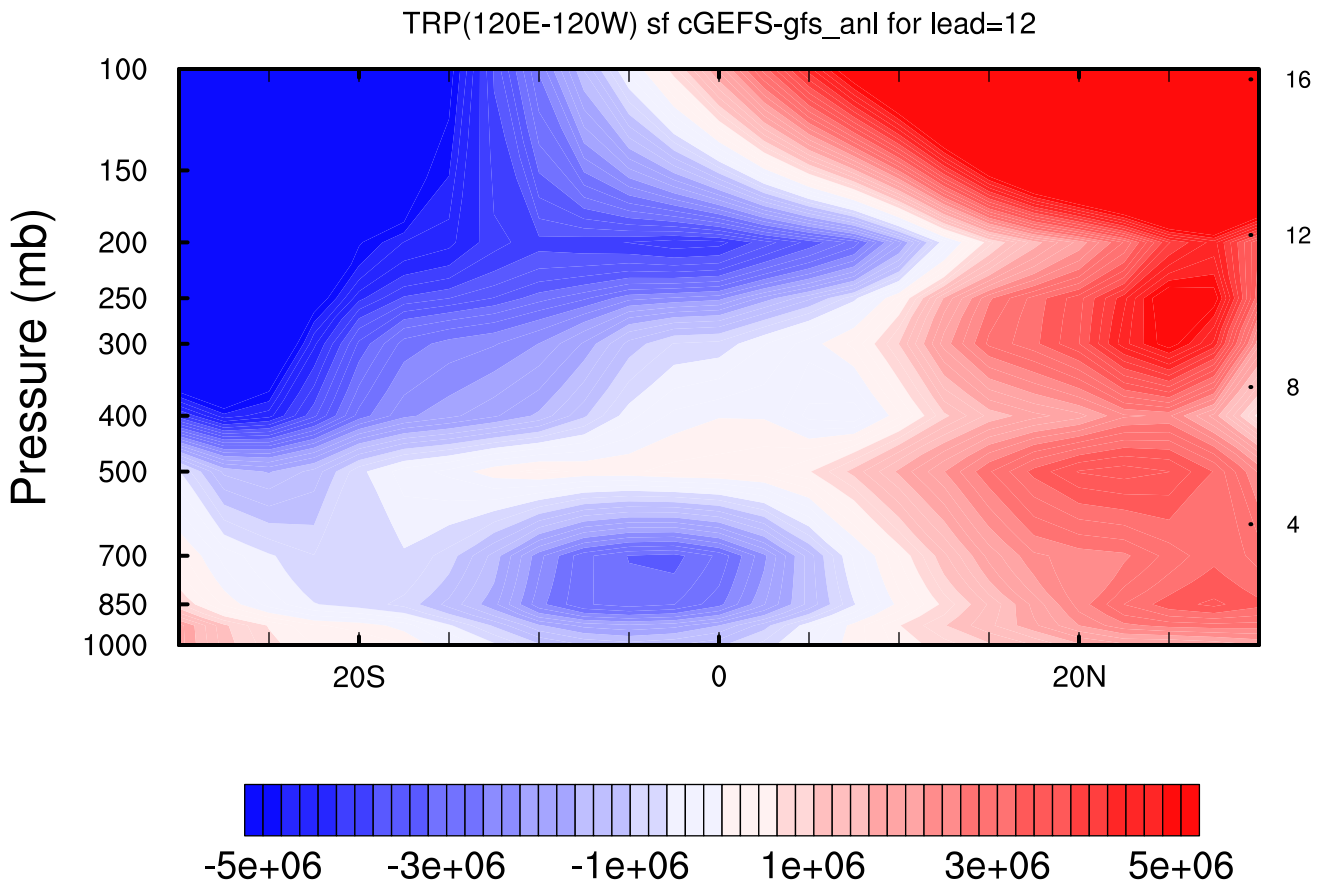

TR(5S-5N) sf cGEFS-gfs_anl for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

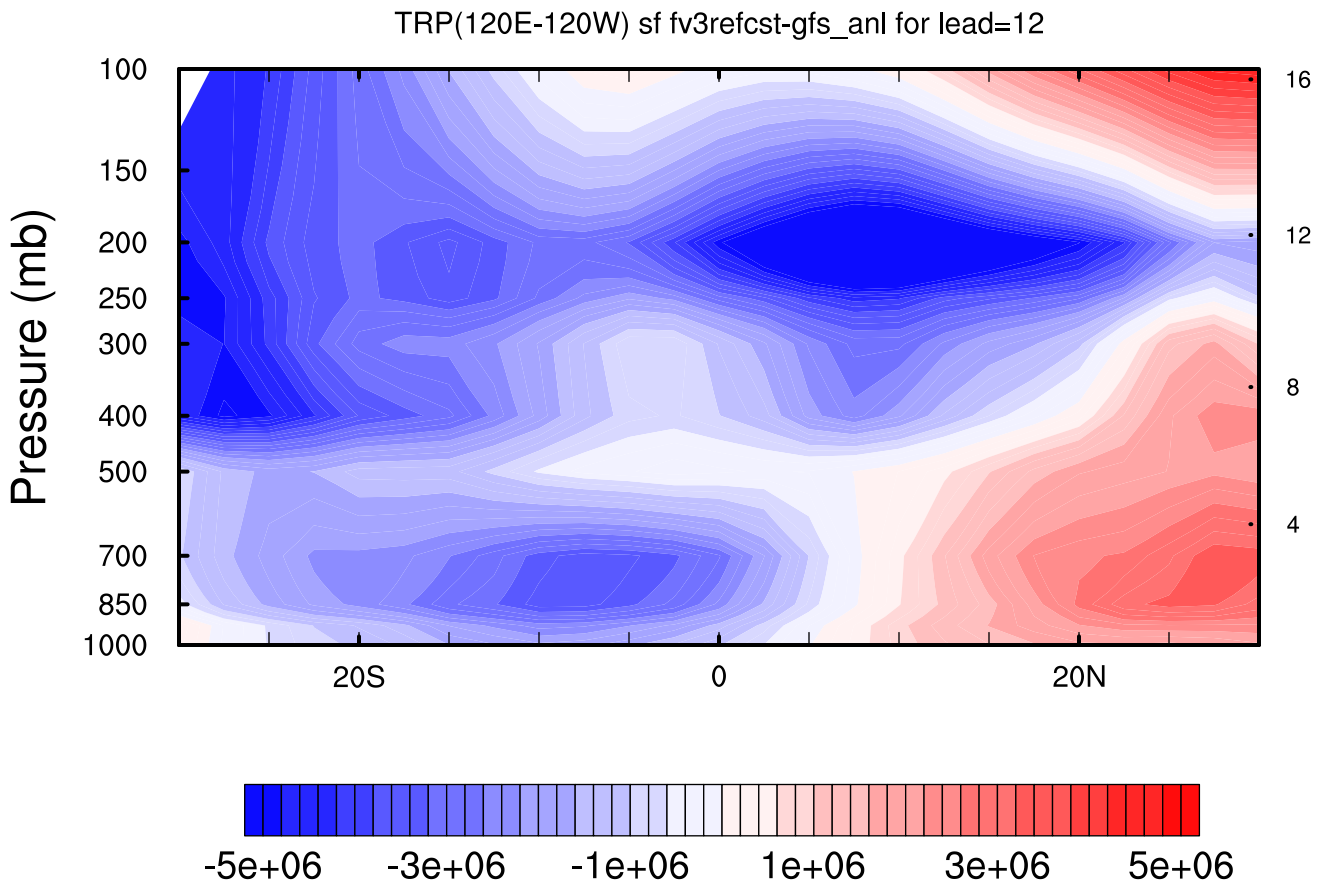

TR(5S-5N) sf fv3refcst-gfs_anl for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

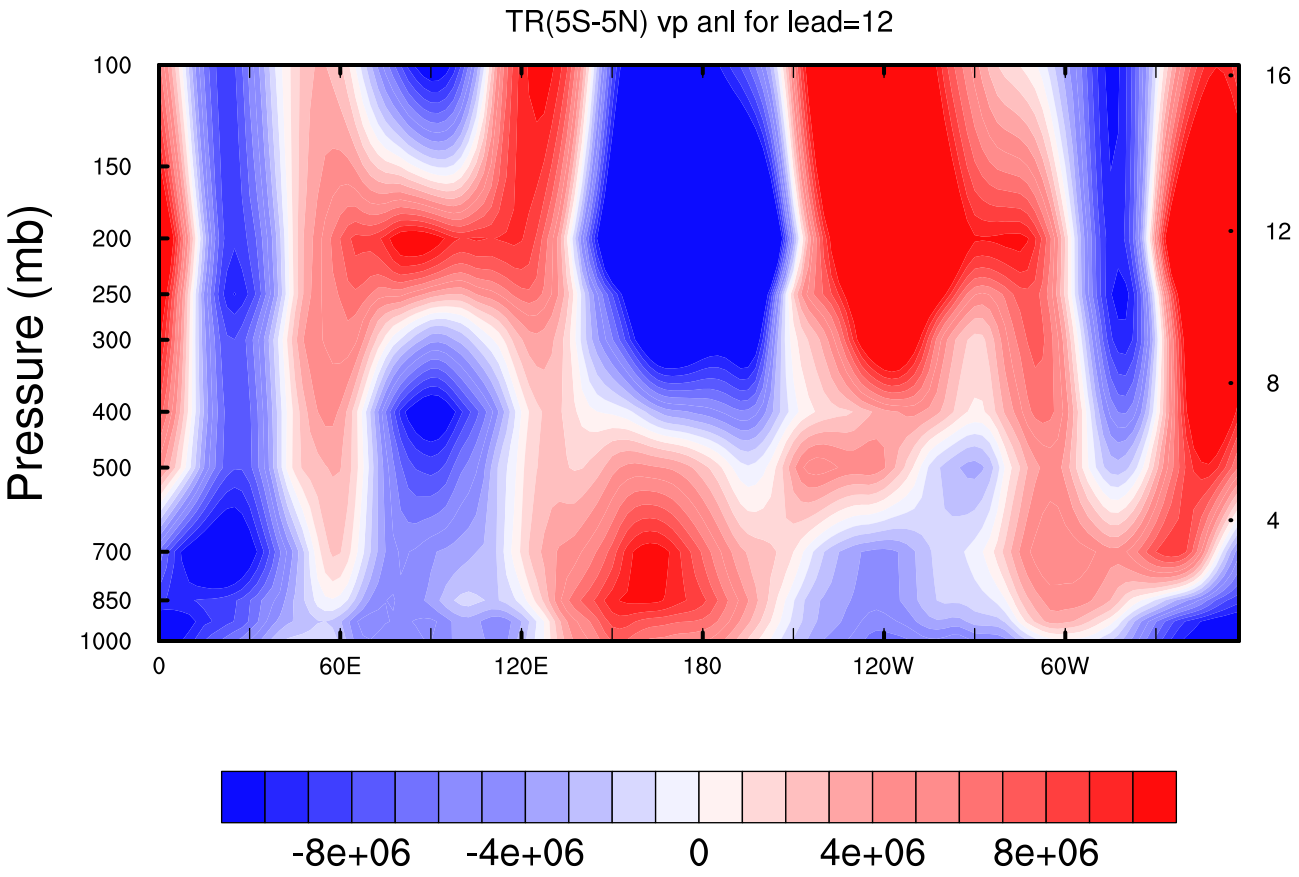

TRP(120E-120W) sf anl for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

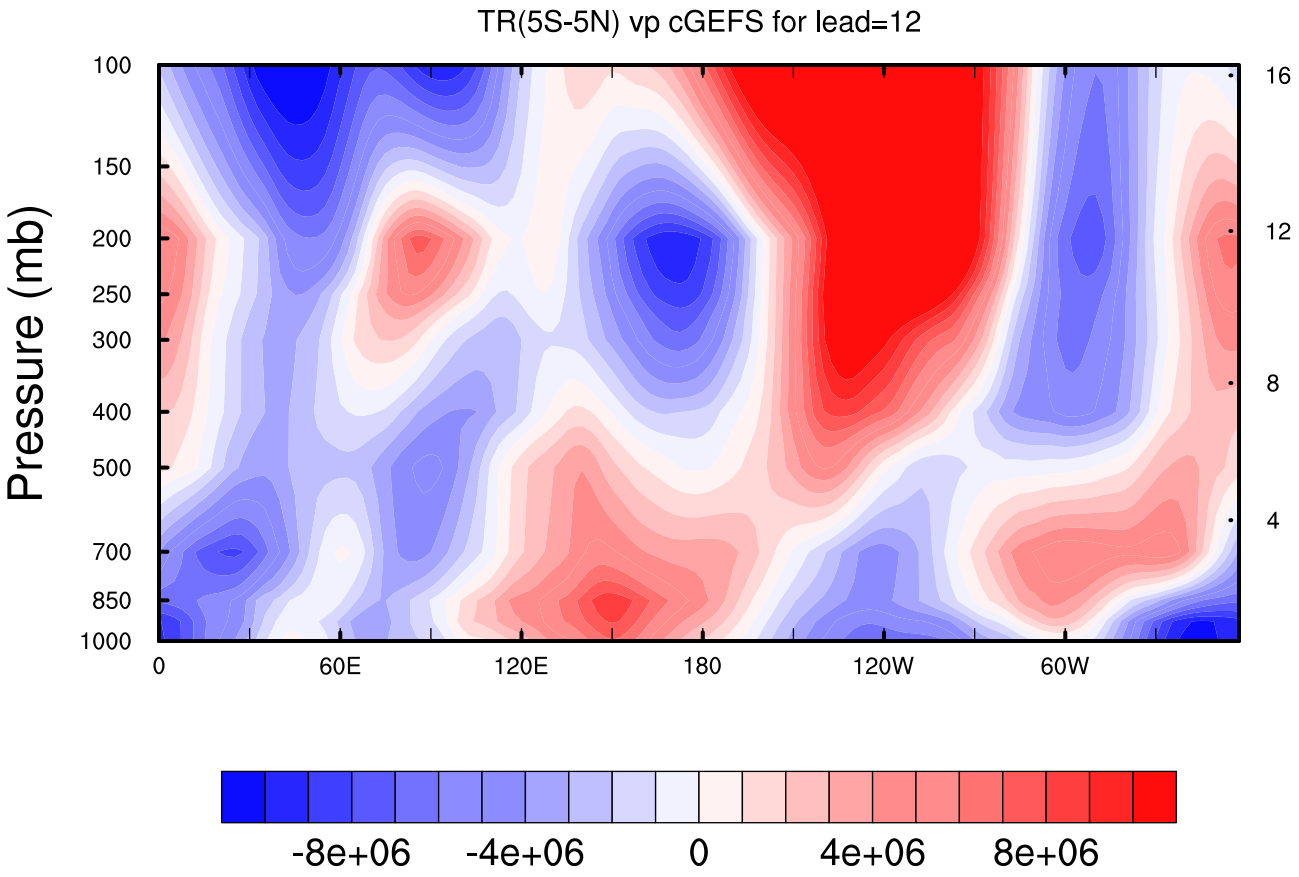

TRP(120E-120W) sf cGEFS for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

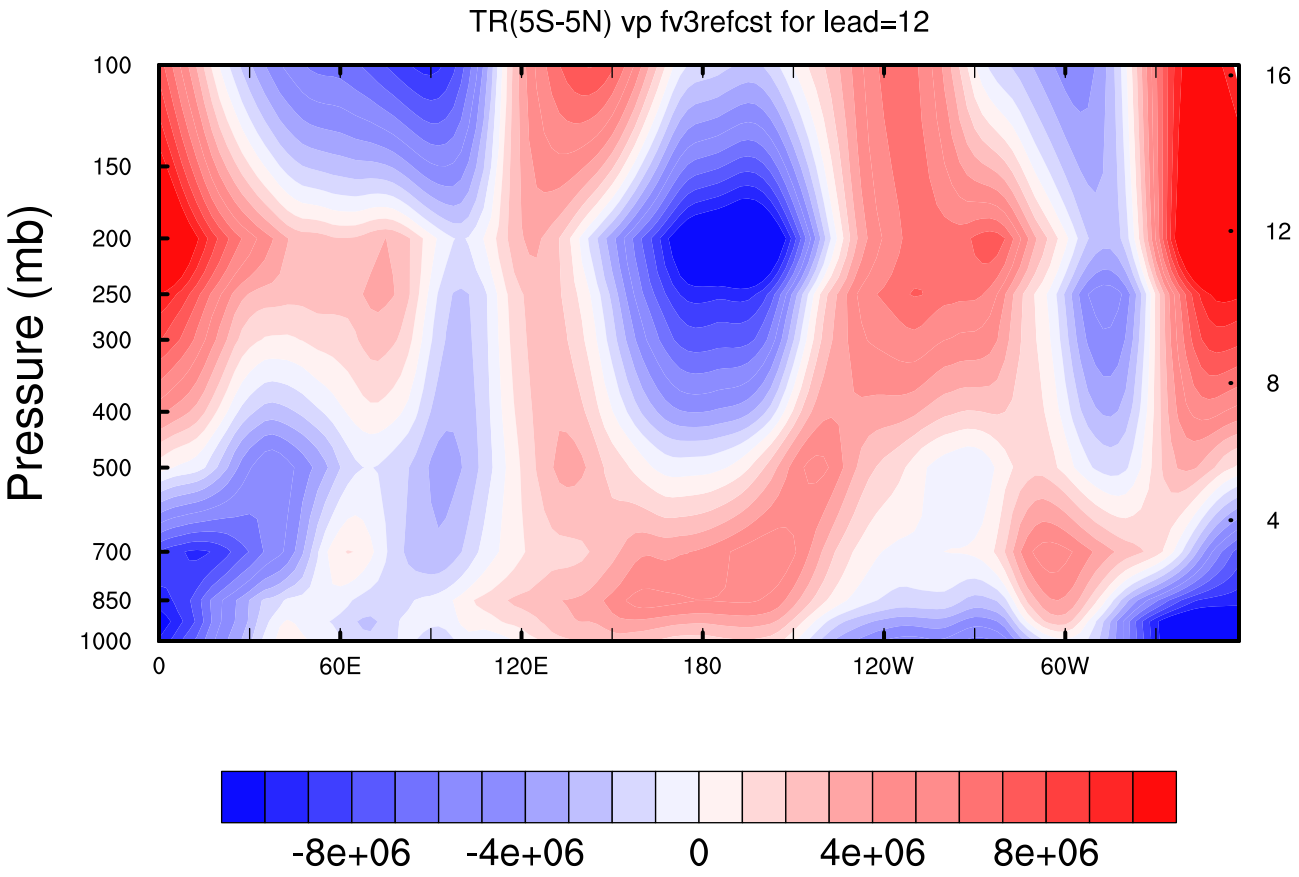

TRP(120E-120W) sf fv3refcst for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

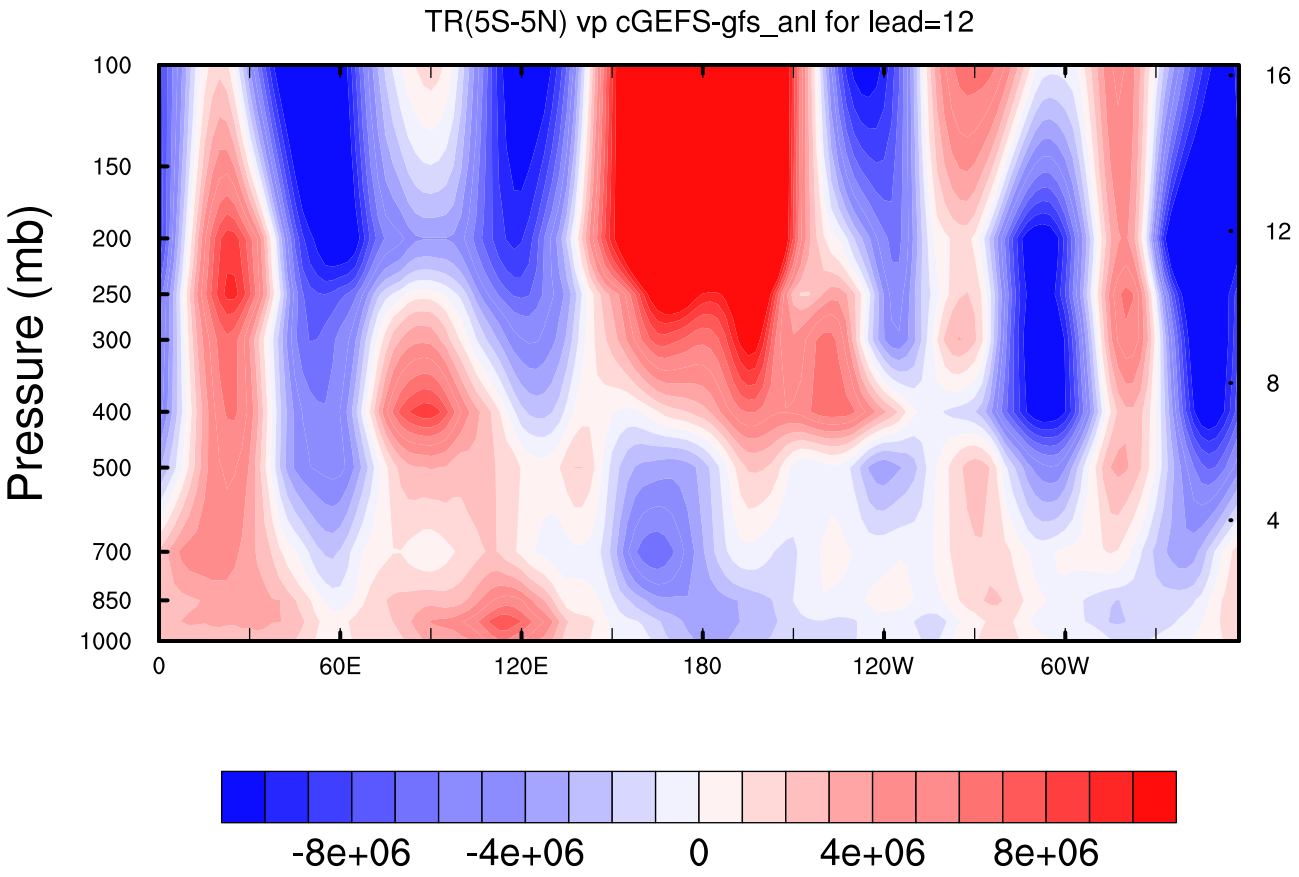

TRP(120E-120W) sf cGEFS-gfs_anl for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

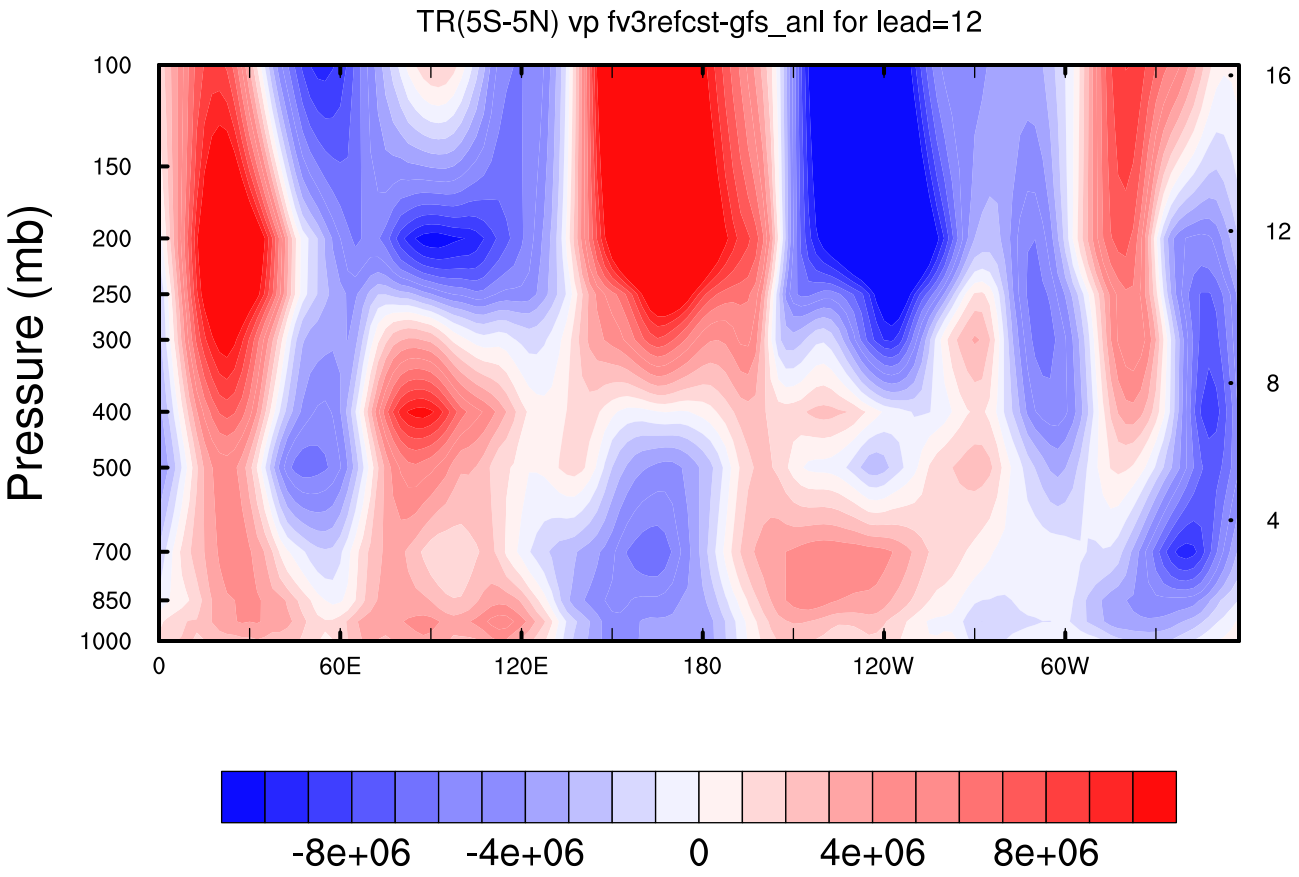

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

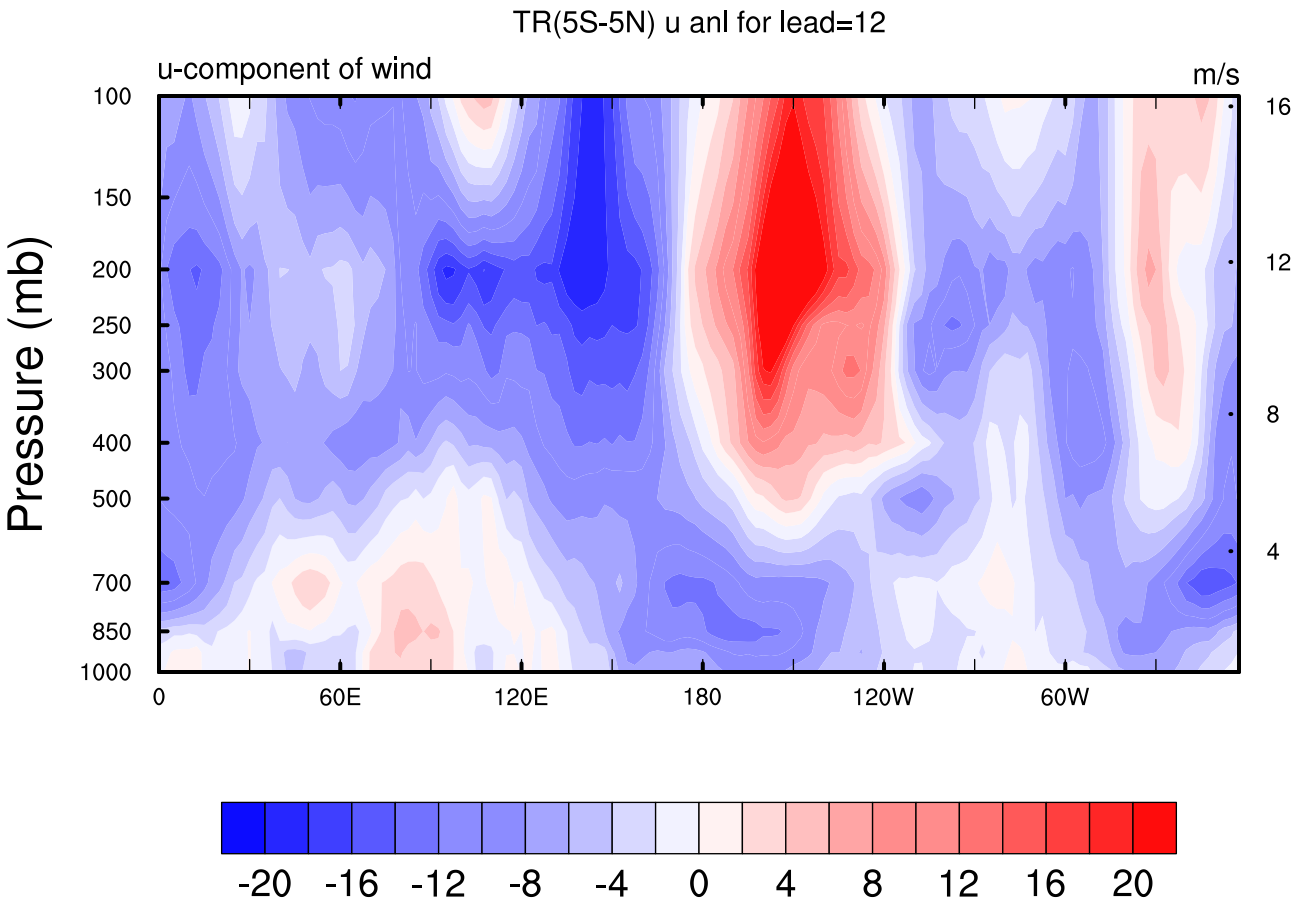

TR(5S-5N) vp anl for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

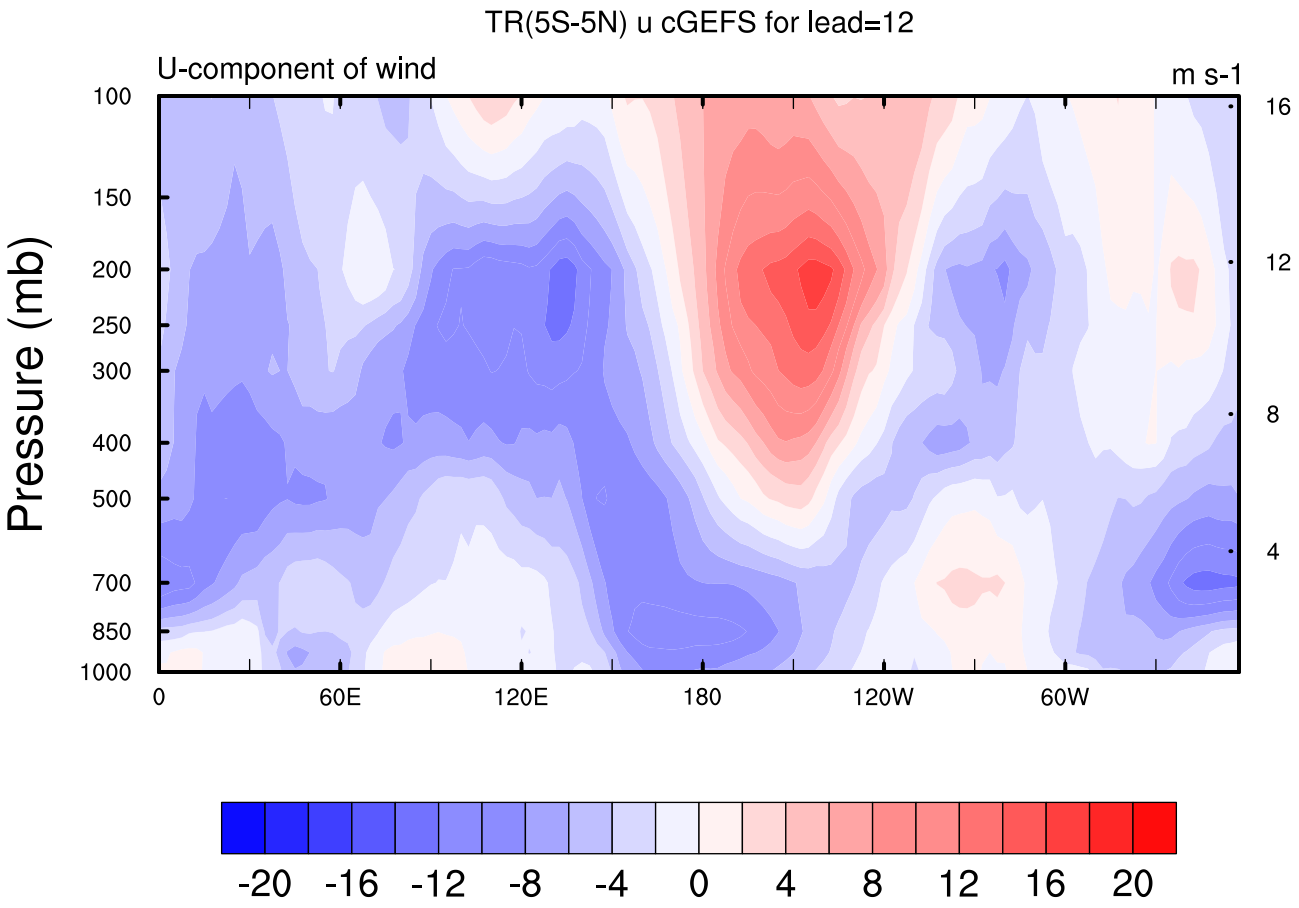

TR(5S-5N) vp cGEFS for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

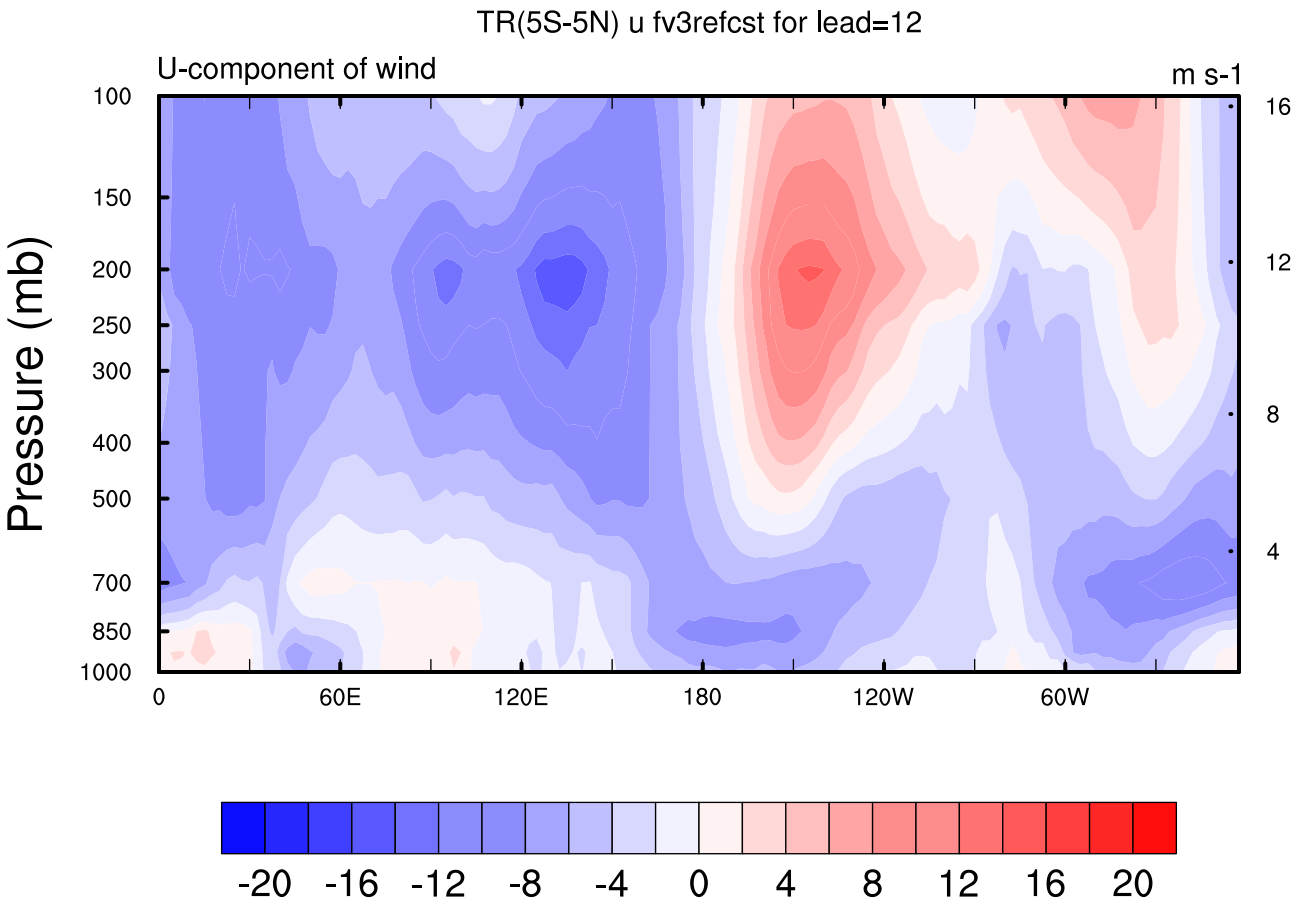

TR(5S-5N) vp fv3refcst for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

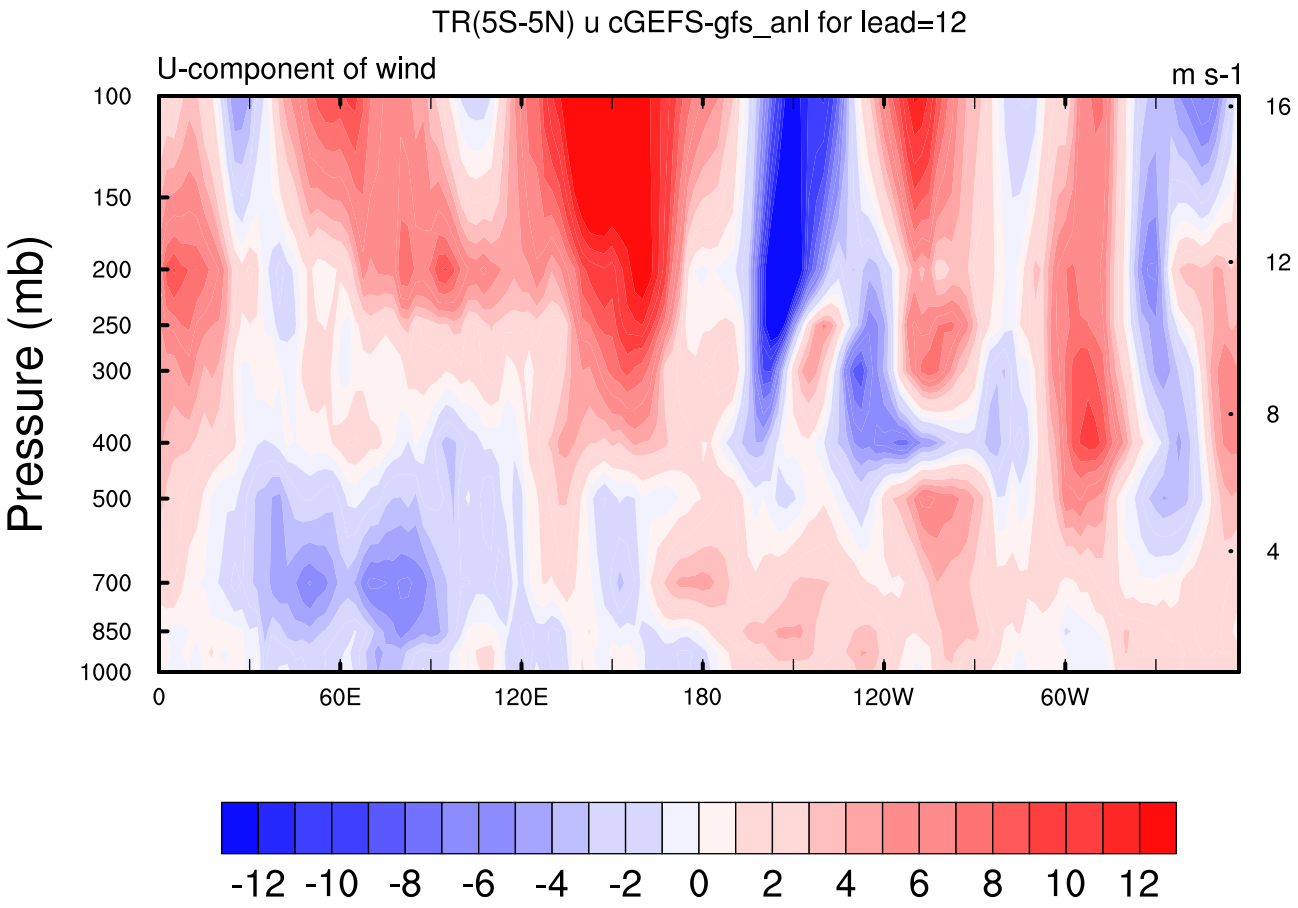

TR(5S-5N) vp cGEFS-gfs_anl for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

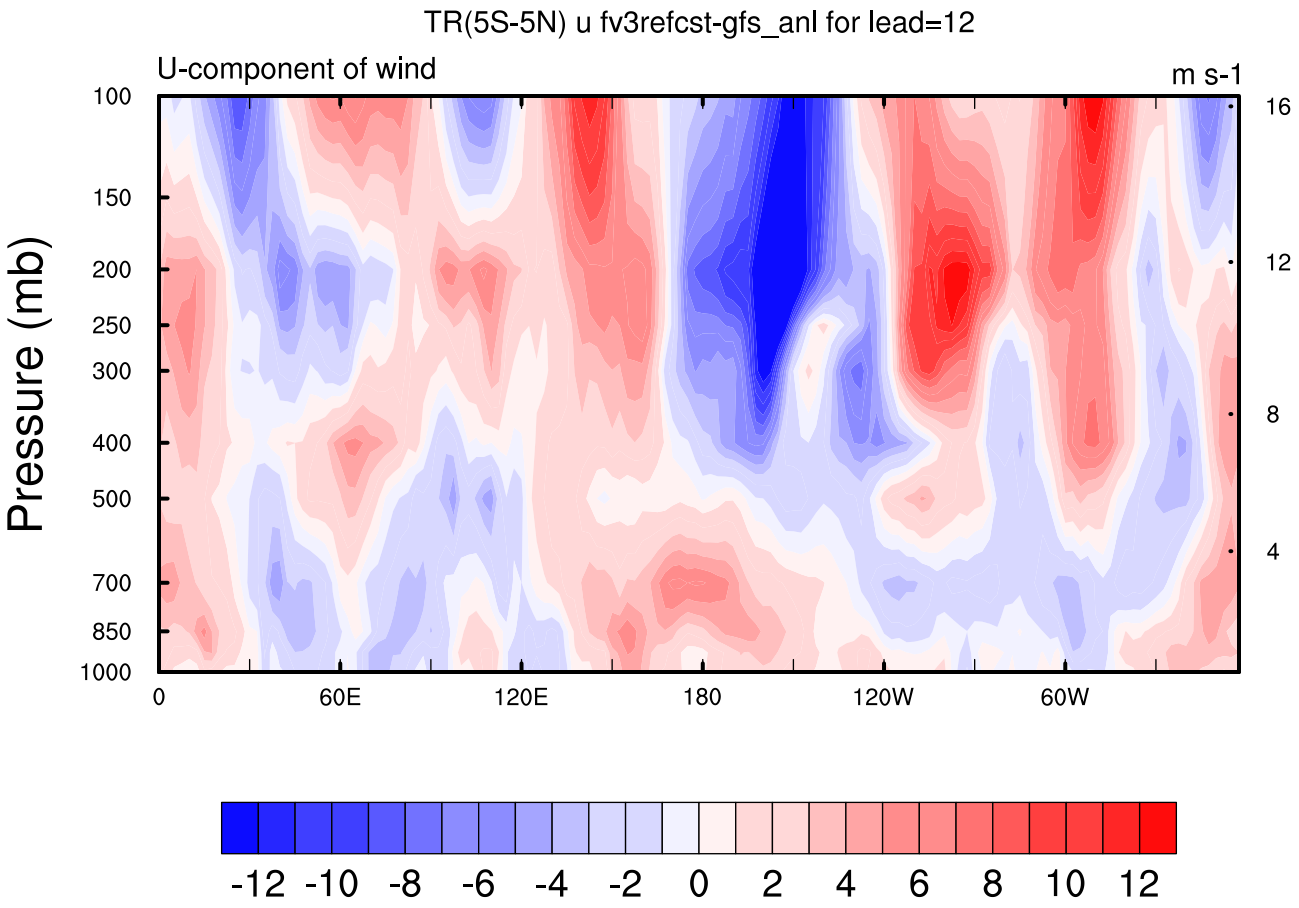

TR(5S-5N) vp fv3refcst-gfs_anl for lead=12
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

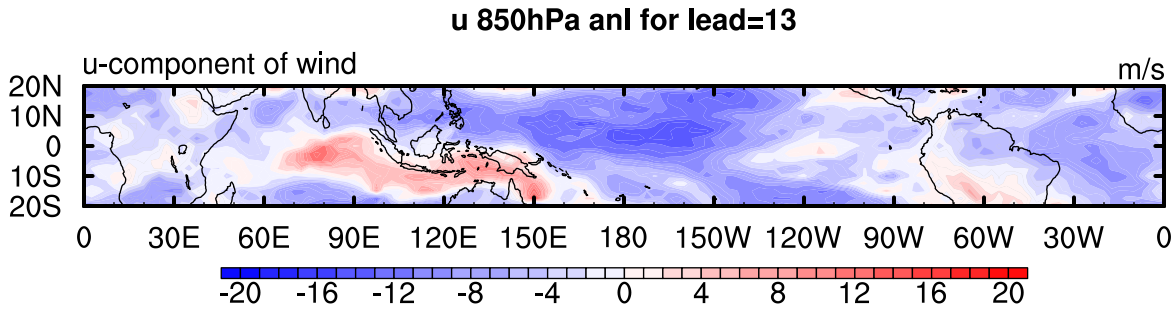

TR(5S-5N) u anl for lead=12
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

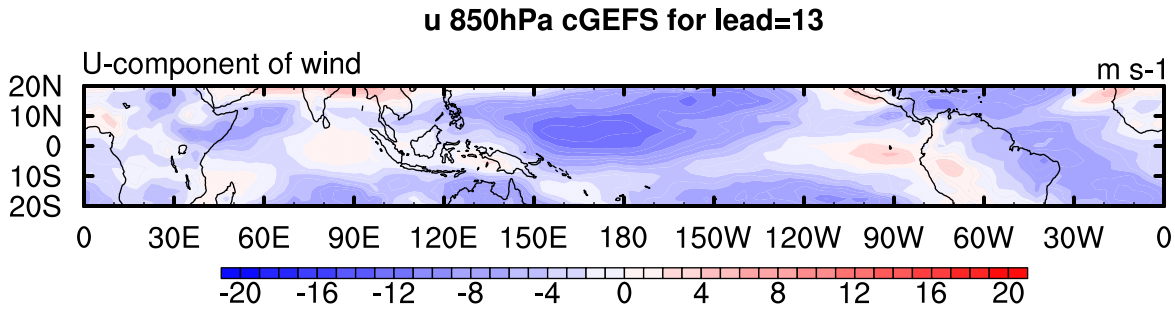

TR(5S-5N) u cGEFS for lead=12
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

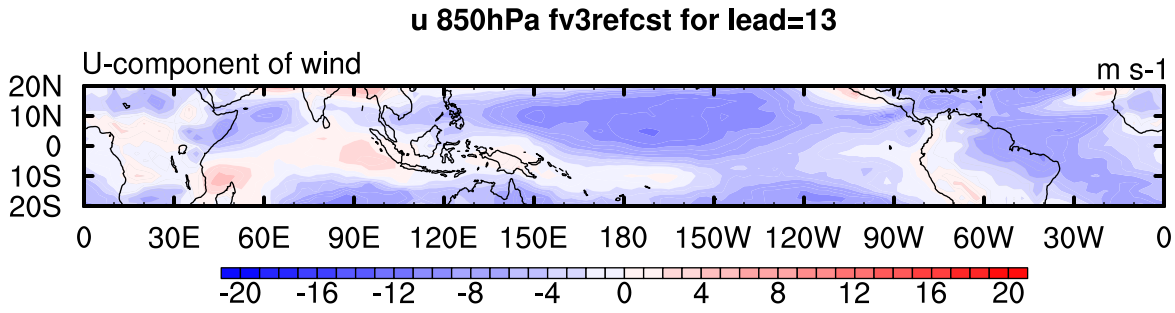

TR(5S-5N) u fv3refcst for lead=12
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

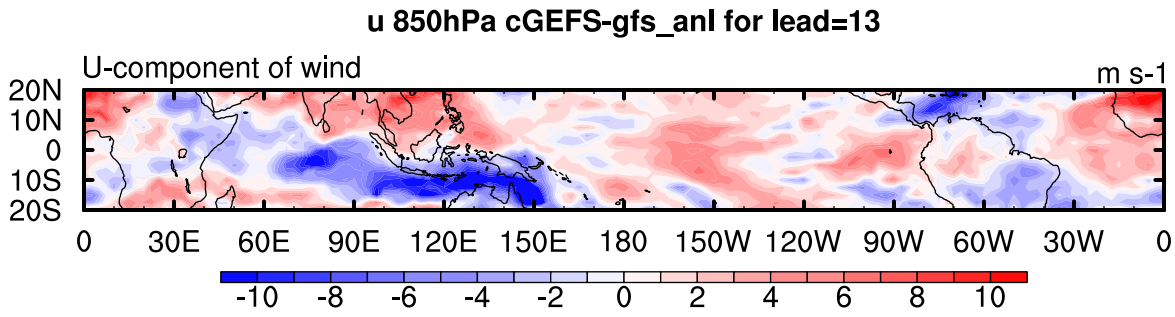

TR(5S-5N) u cGEFS-gfs_anl for lead=12
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

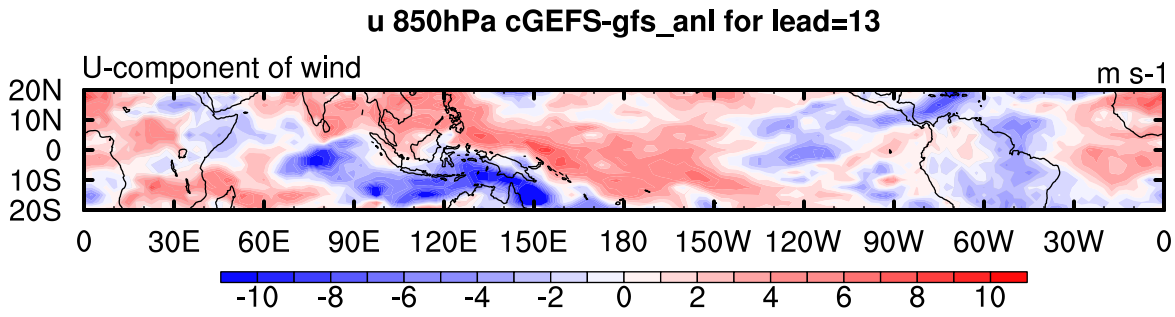

TR(5S-5N) u fv3refcst-gfs_anl for lead=12
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

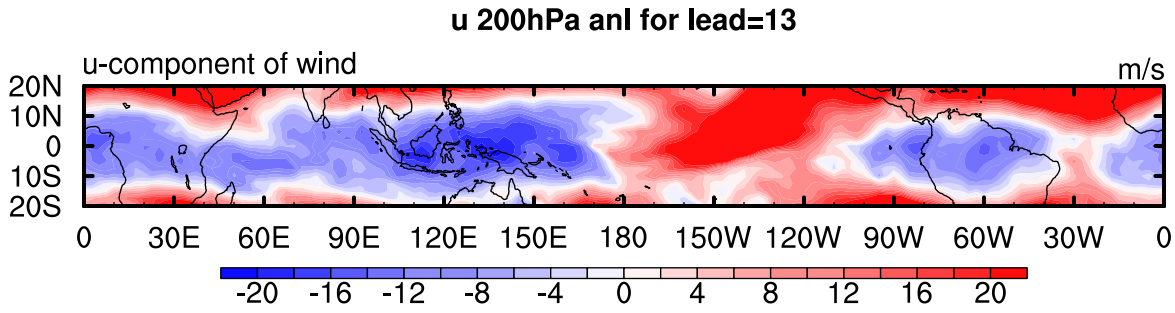

u 850hPa anl for lead=13
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

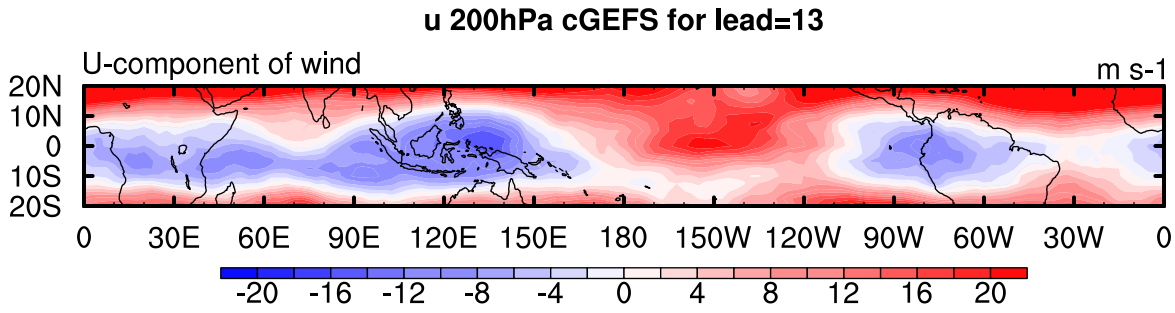

u 850hPa cGEFS for lead=13
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

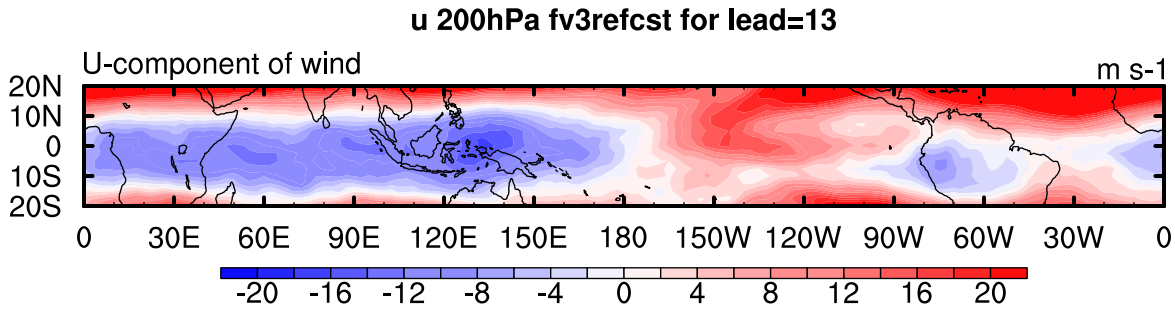

u 850hPa fv3refcst for lead=13
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

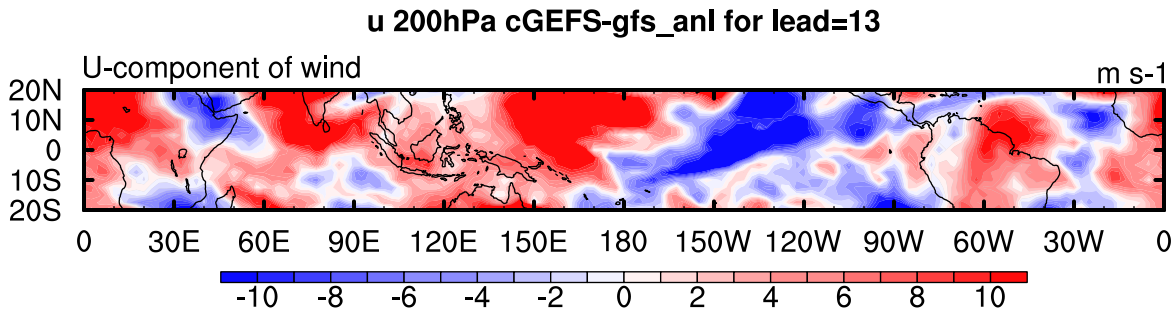

u 850hPa cGEFS-gfs_anl for lead=13
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

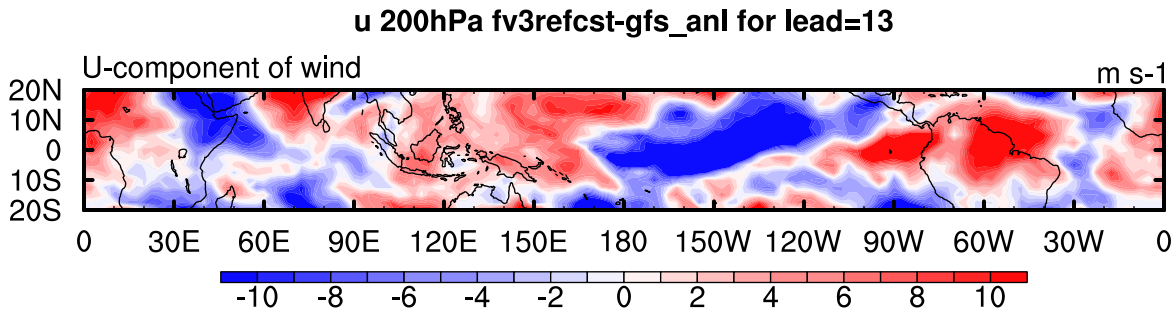

u 850hPa cGEFS-gfs_anl for lead=13
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

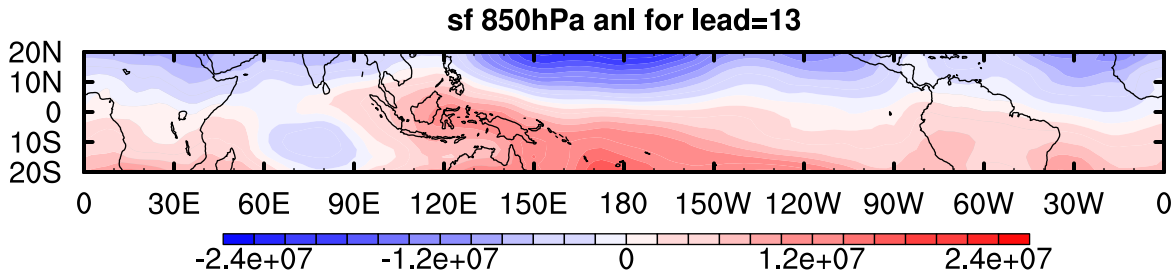

u 200hPa anl for lead=13
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

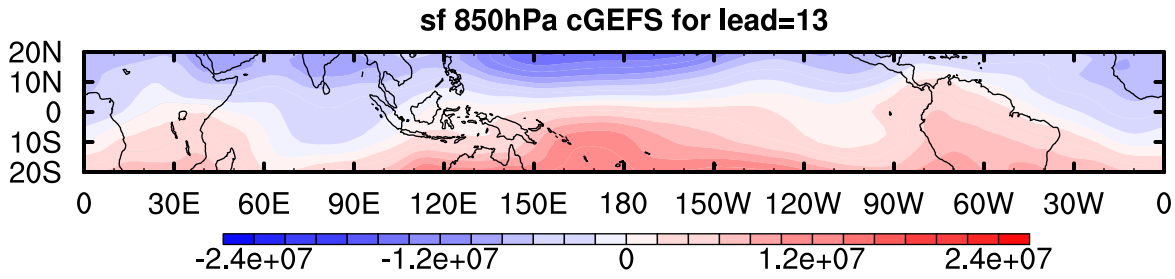

u 200hPa cGEFS for lead=13
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

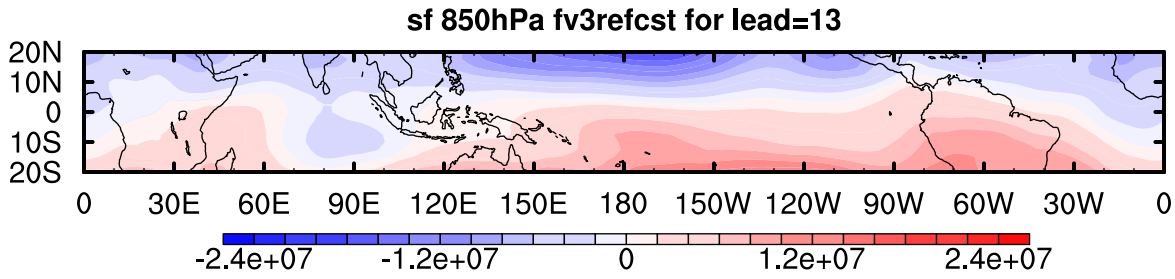

u 200hPa fv3refcst for lead=13
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

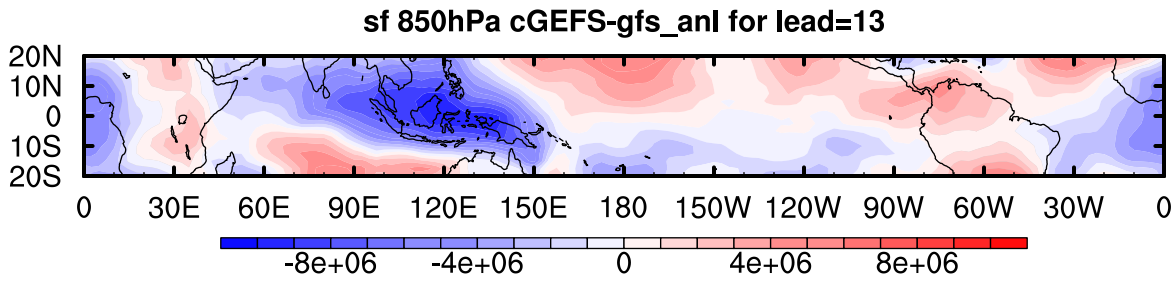

u 200hPa cGEFS-gfs_anl for lead=13
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

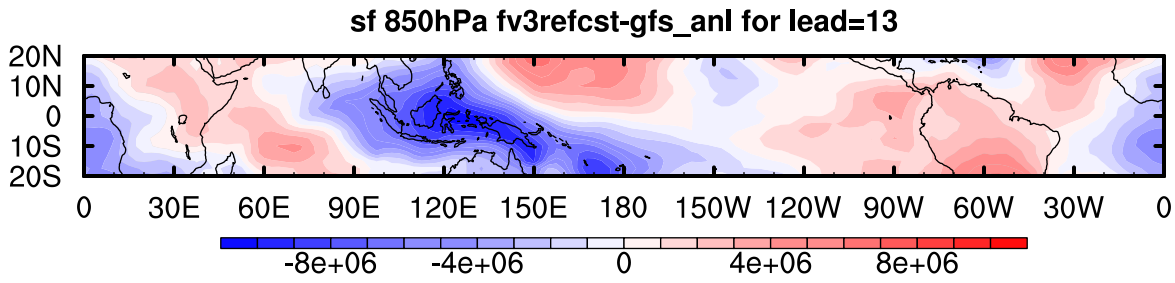

u 200hPa fv3refcst-gfs_anl for lead=13
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

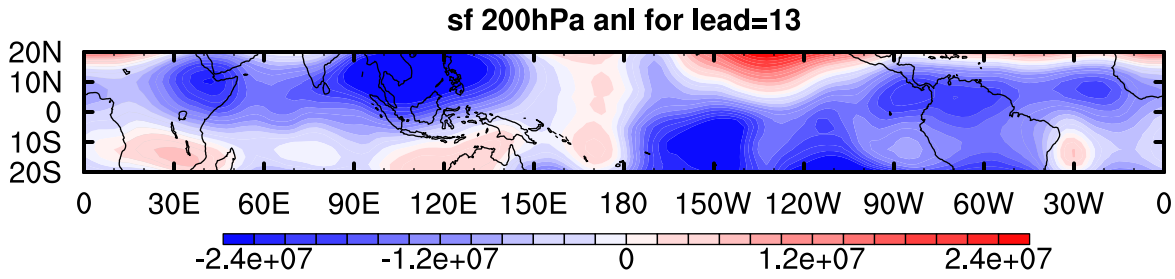

sf 850hPa anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

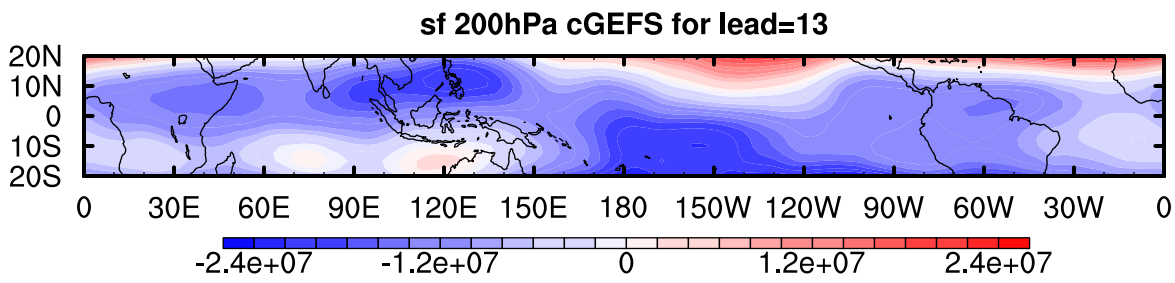

sf 850hPa cGEFS for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

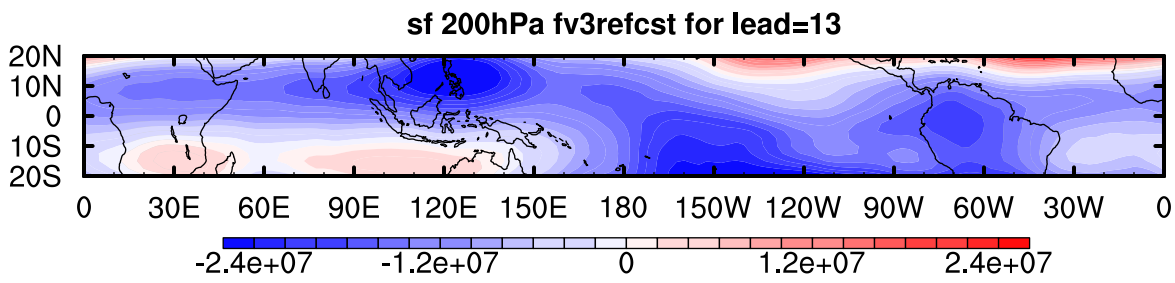

sf 850hPa fv3refcst for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

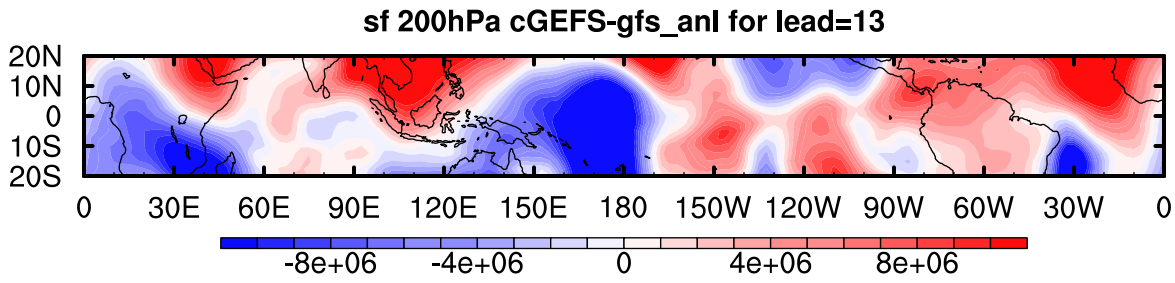

sf 850hPa cGEFS-gfs_anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

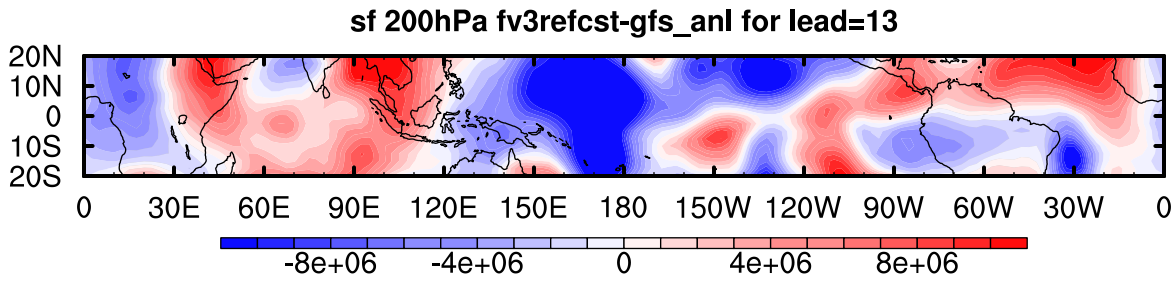

sf 850hPa fv3refcst-gfs_anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

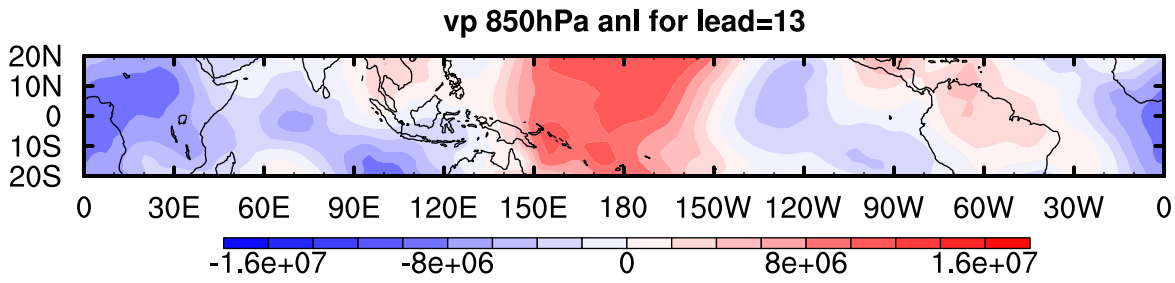

sf 200hPa anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

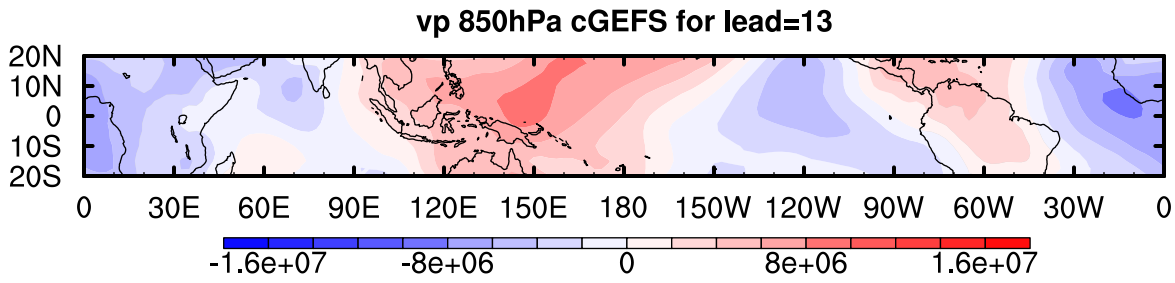

sf 200hPa cGEFS for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

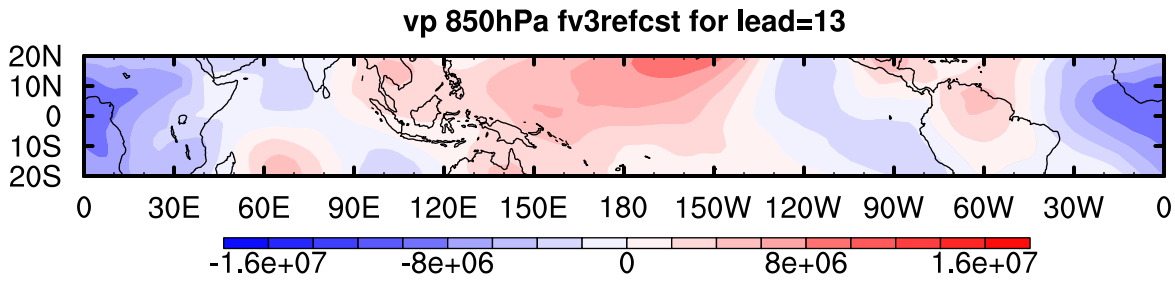

sf 200hPa fv3refcst for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

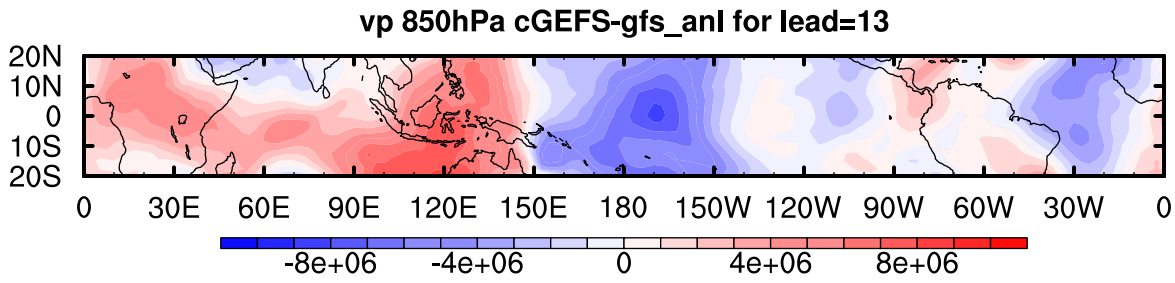

sf 200hPa cGEFS-gfs_anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

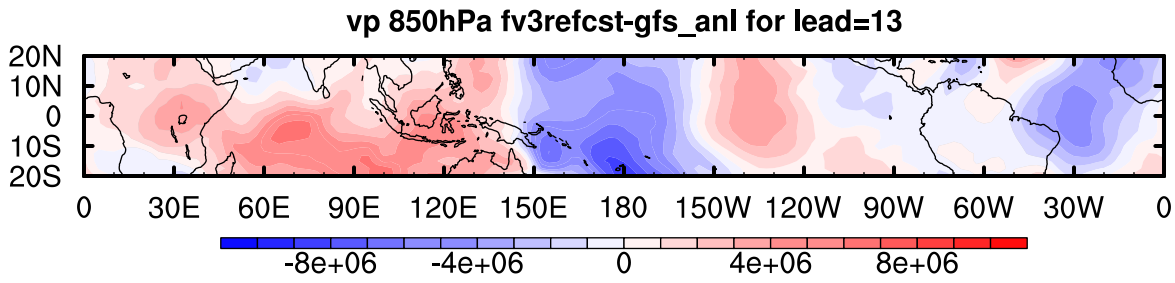

sf 200hPa fv3refcst-gfs_anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

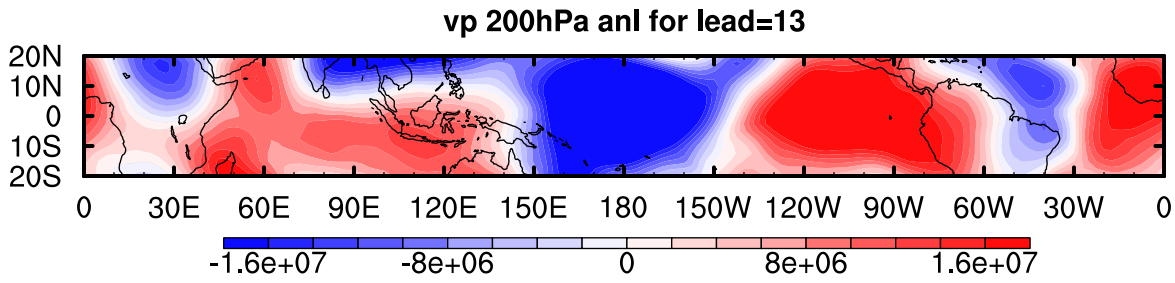

vp 850hPa anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

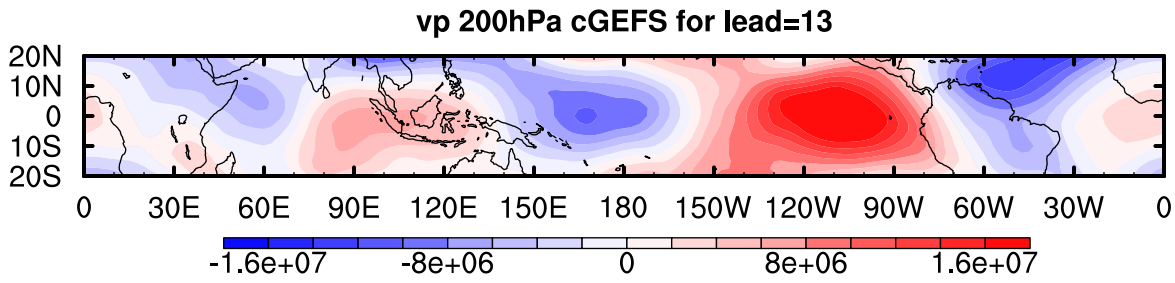

vp 850hPa cGEFS for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

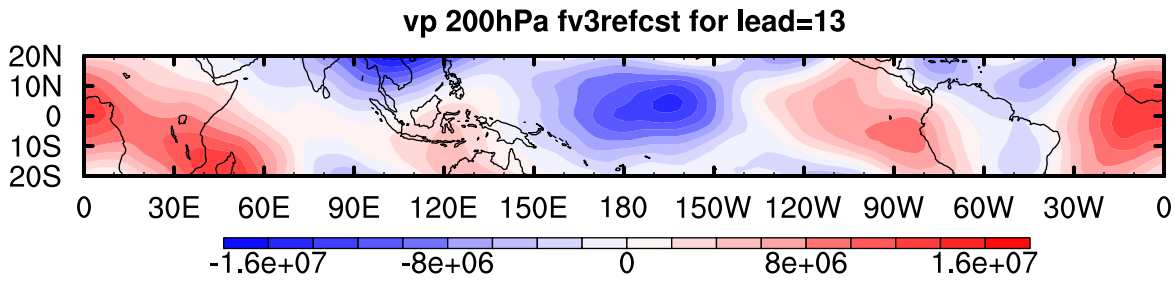

vp 850hPa fv3refcst for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

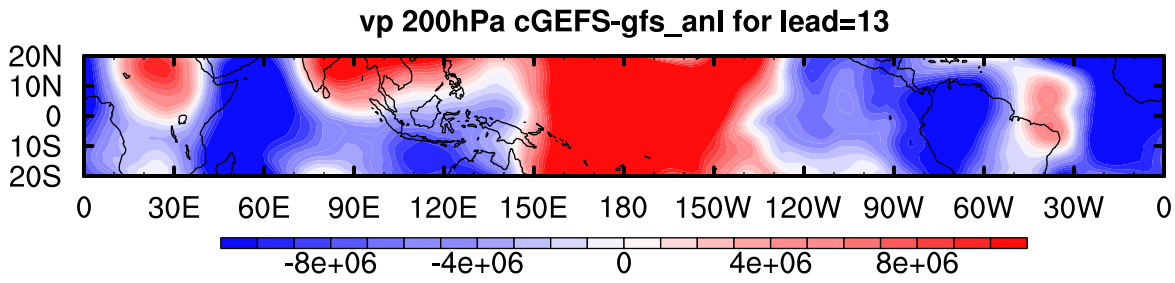

vp 850hPa cGEFS-gfs_anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

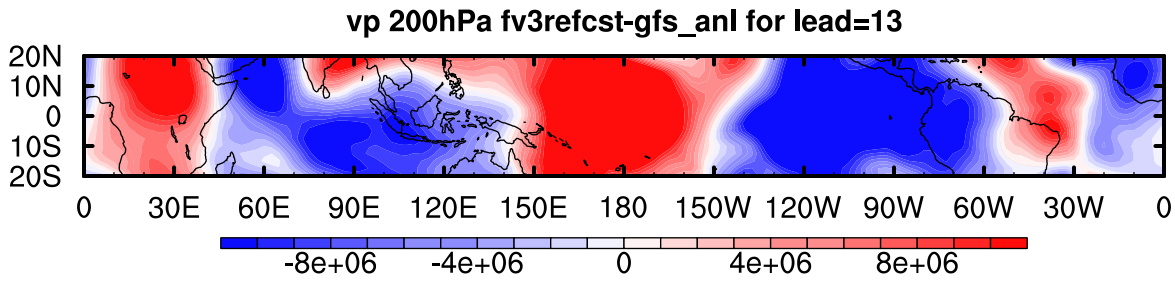

vp 850hPa fv3refcst-gfs_anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

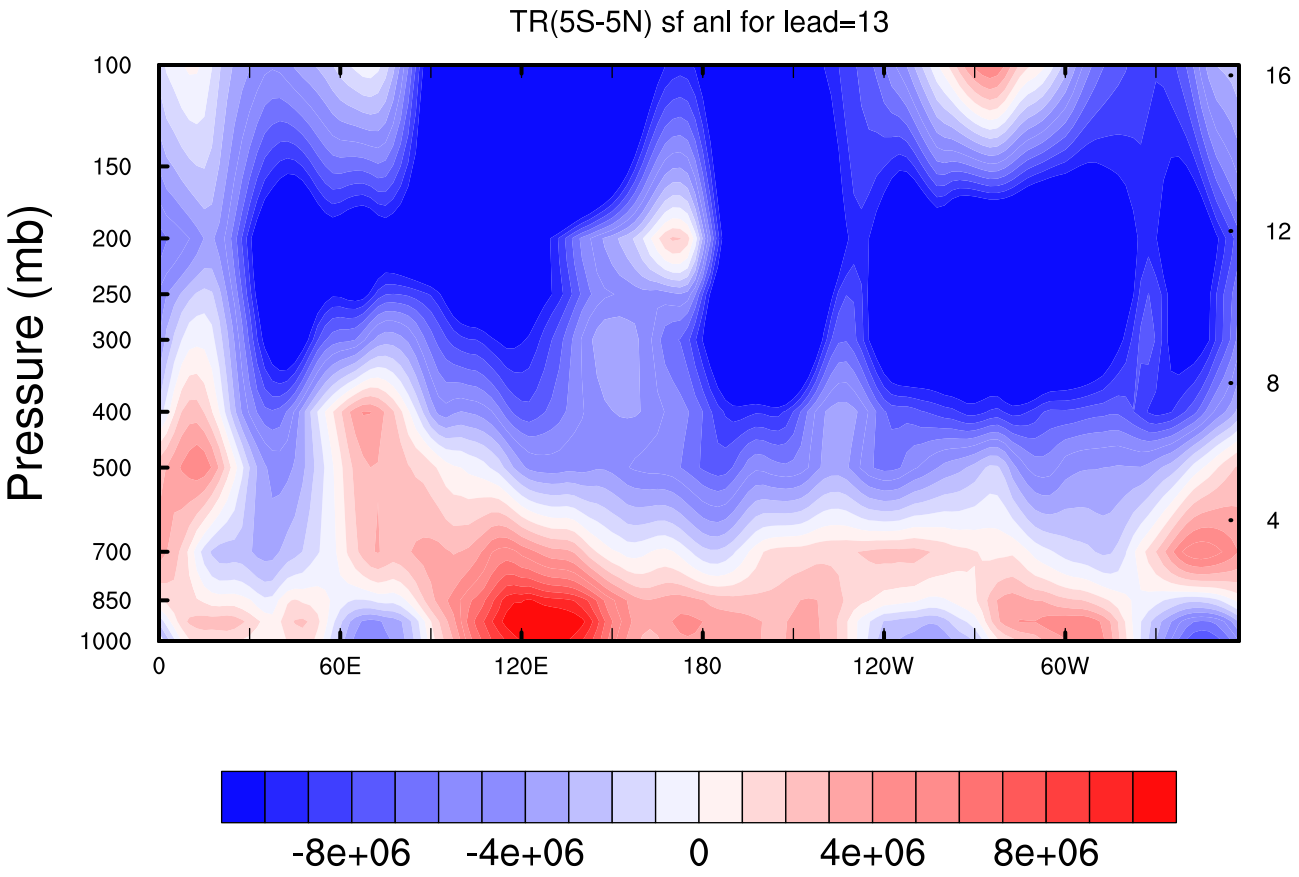

vp 200hPa anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

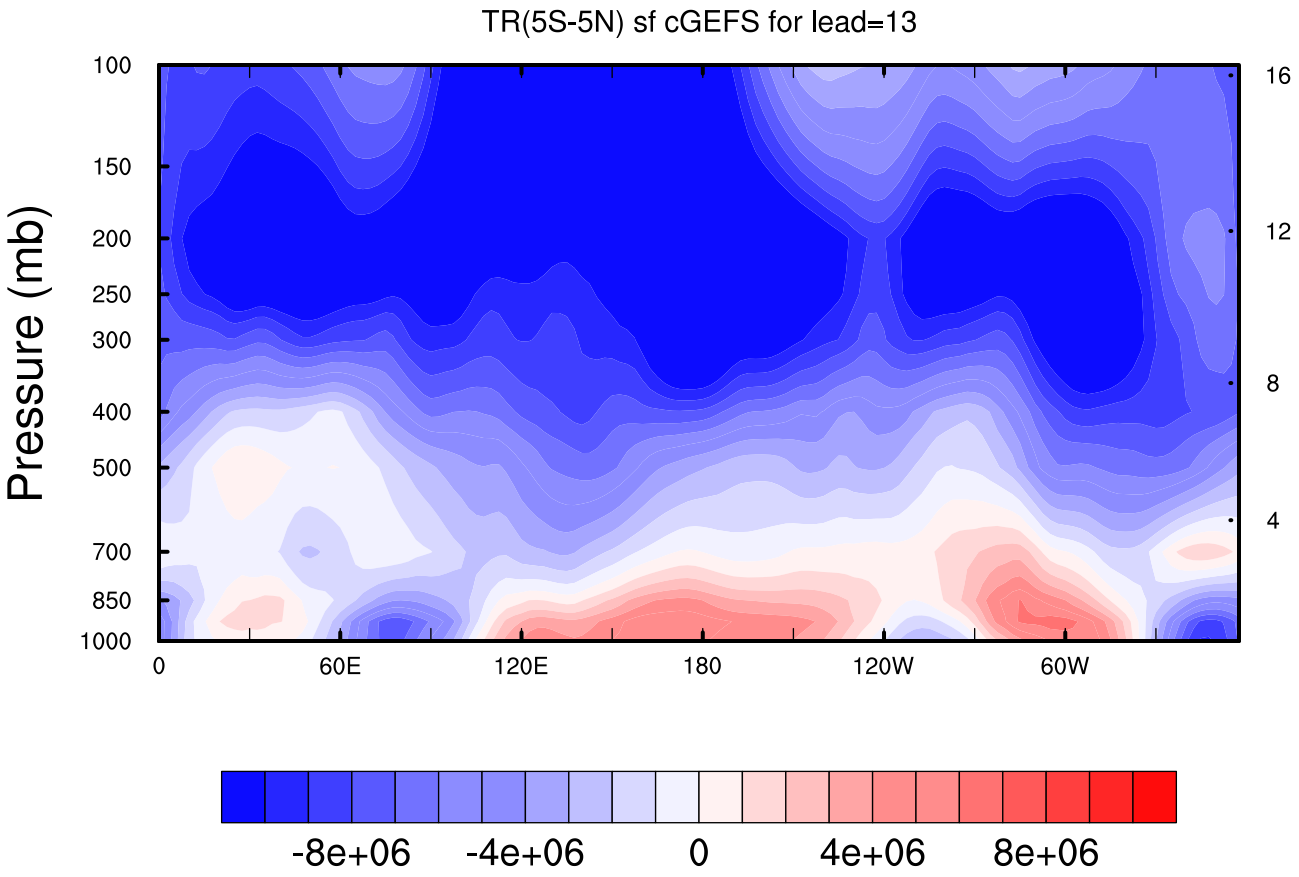

vp 200hPa cGEFS for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

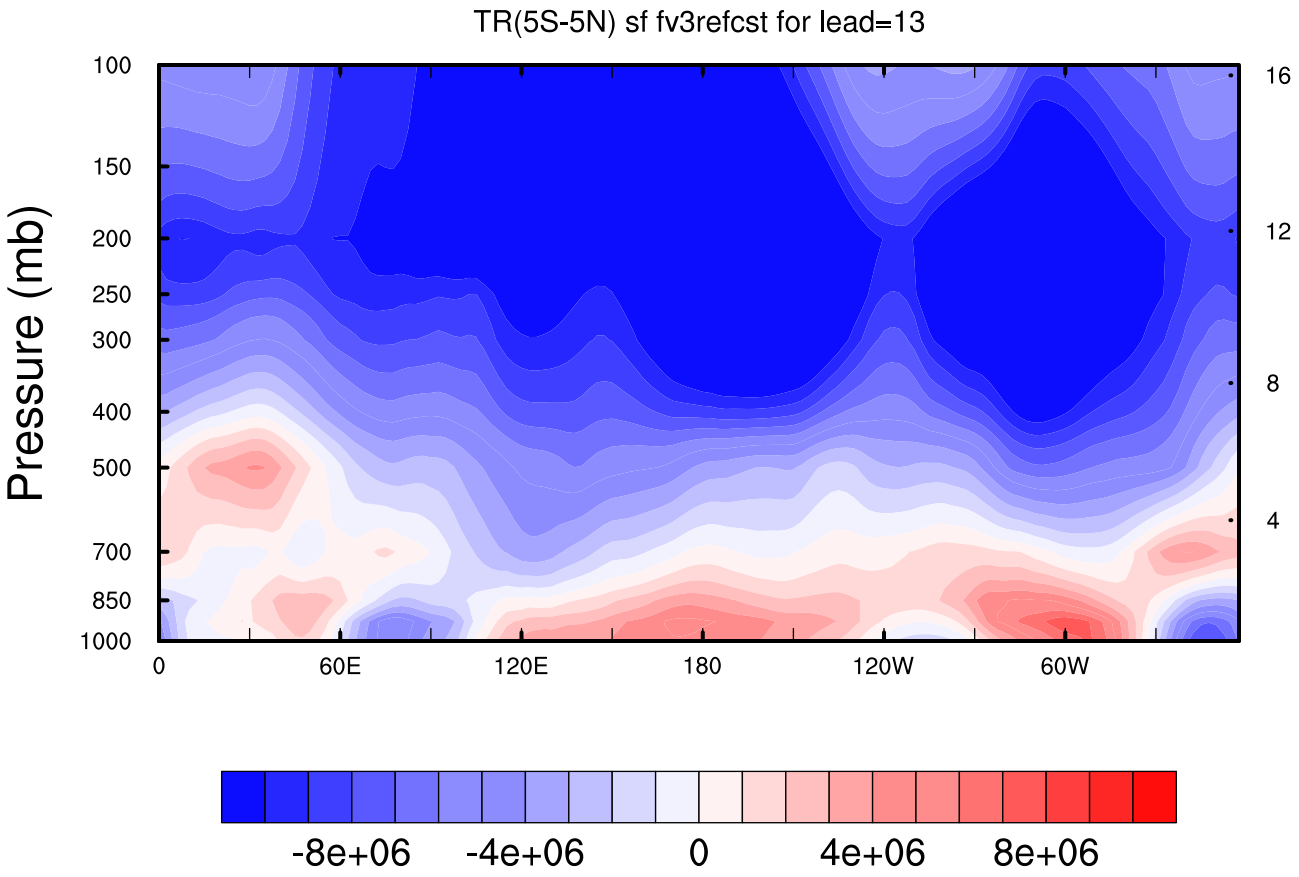

vp 200hPa fv3refcst for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

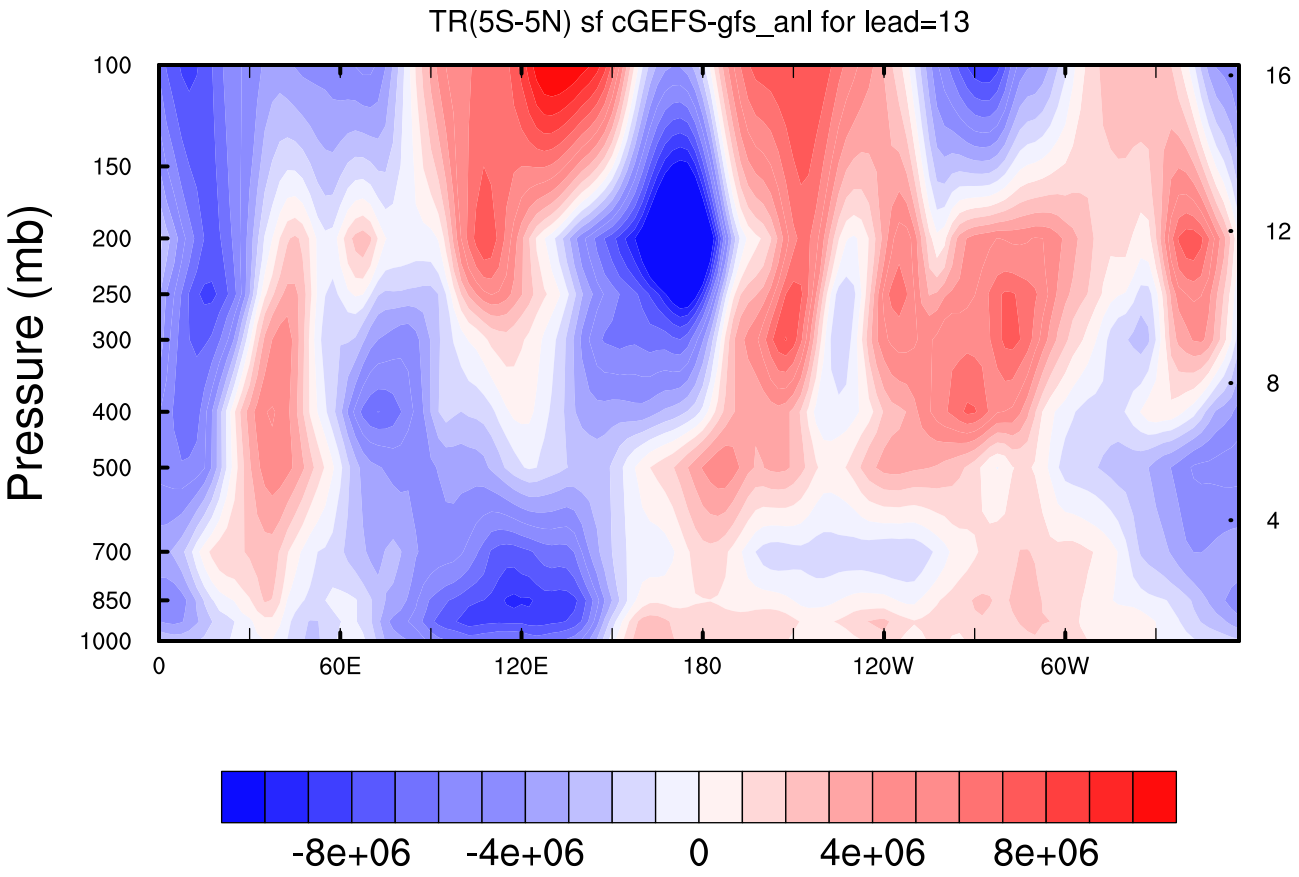

vp 200hPa cGEFS-gfs_anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

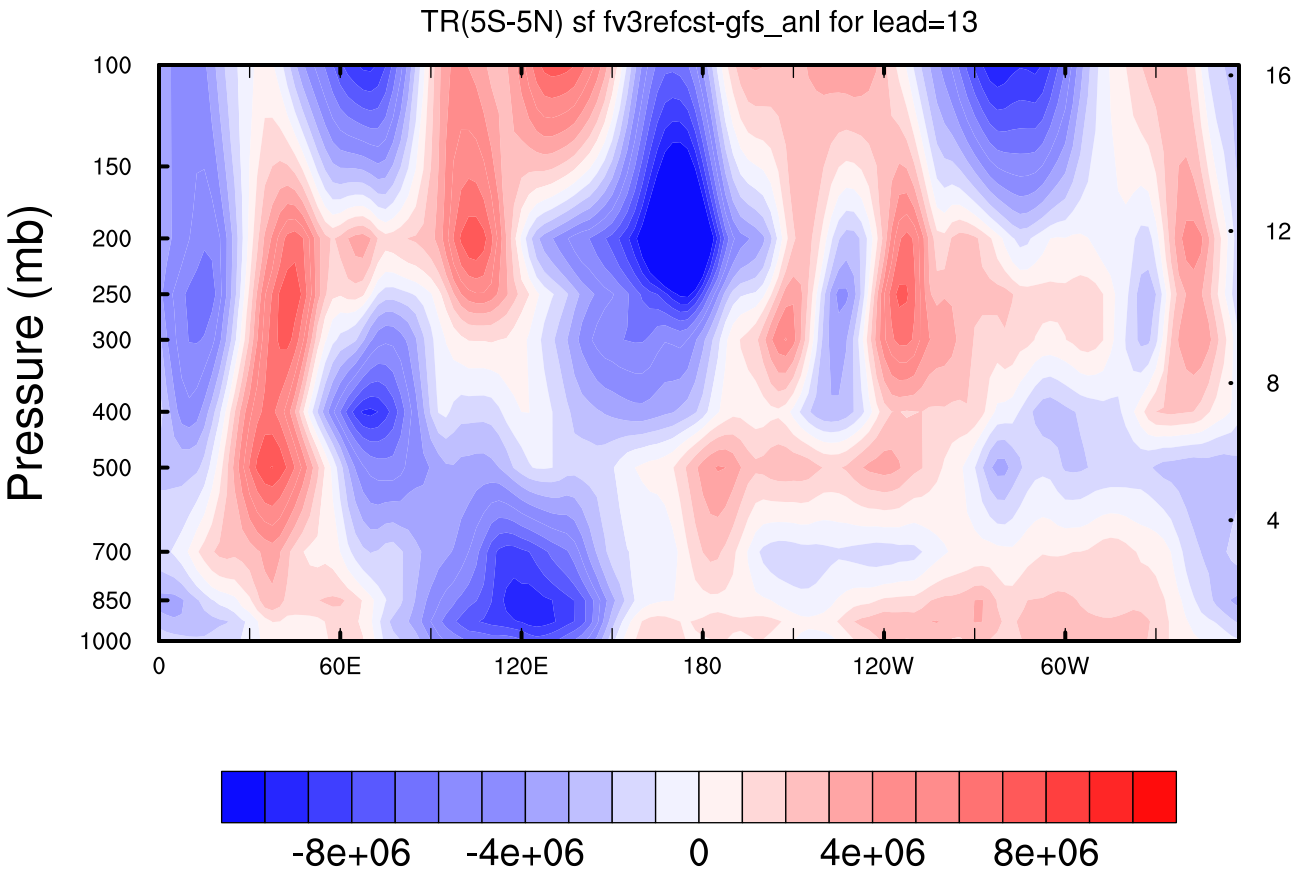

vp 200hPa fv3refcst-gfs_anl for lead=13
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

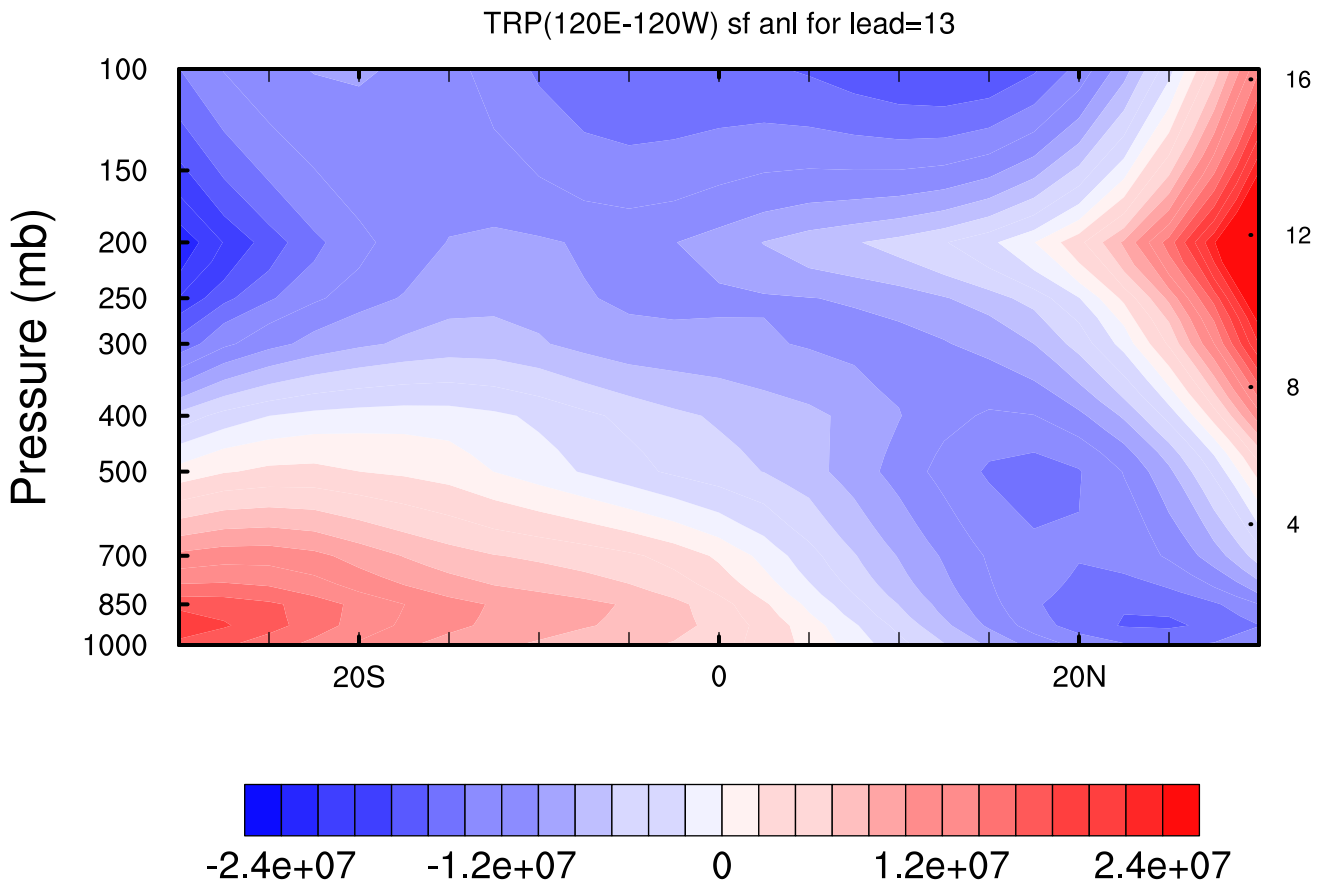

TR(5S-5N) sf anl for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

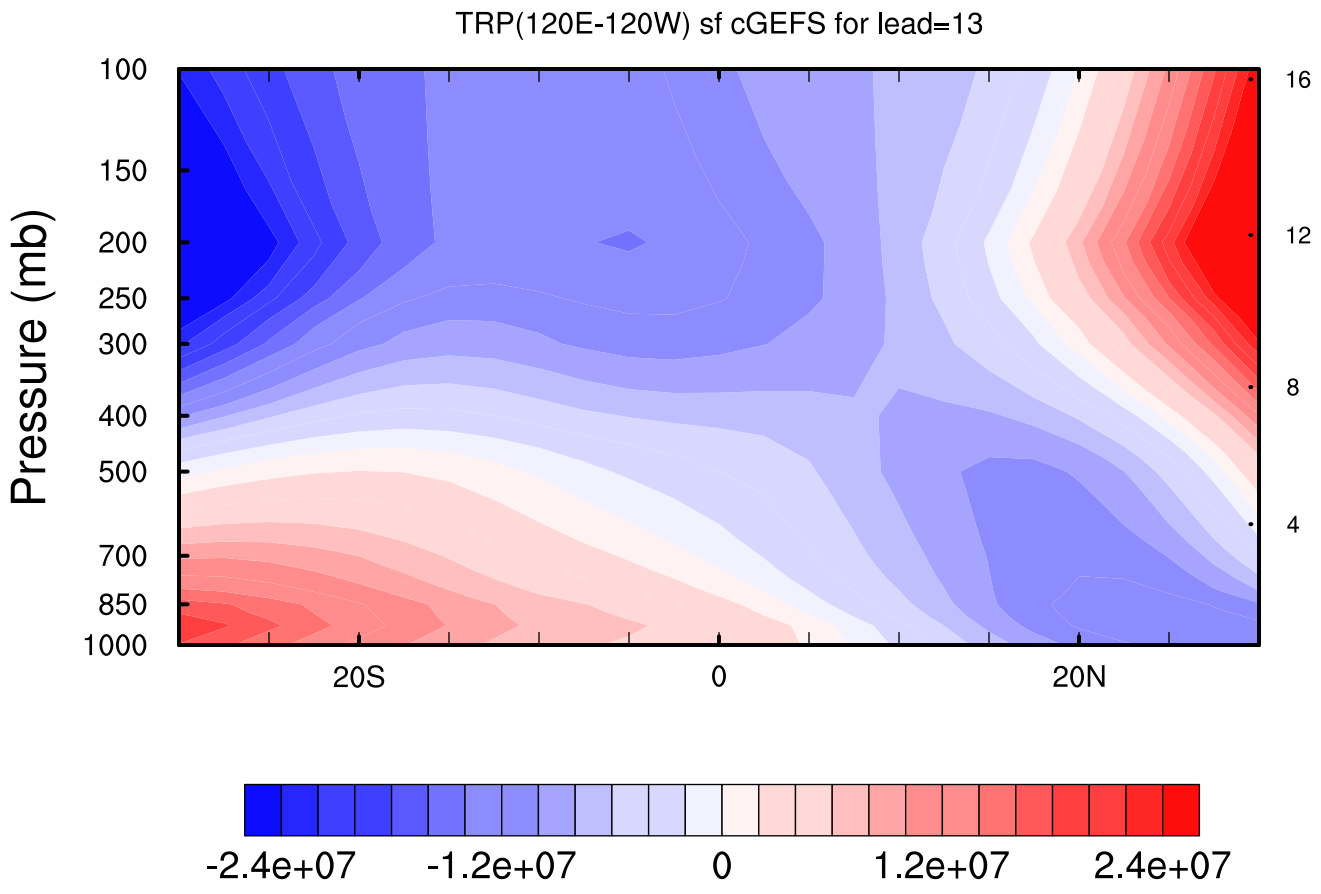

TR(5S-5N) sf cGEFS for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

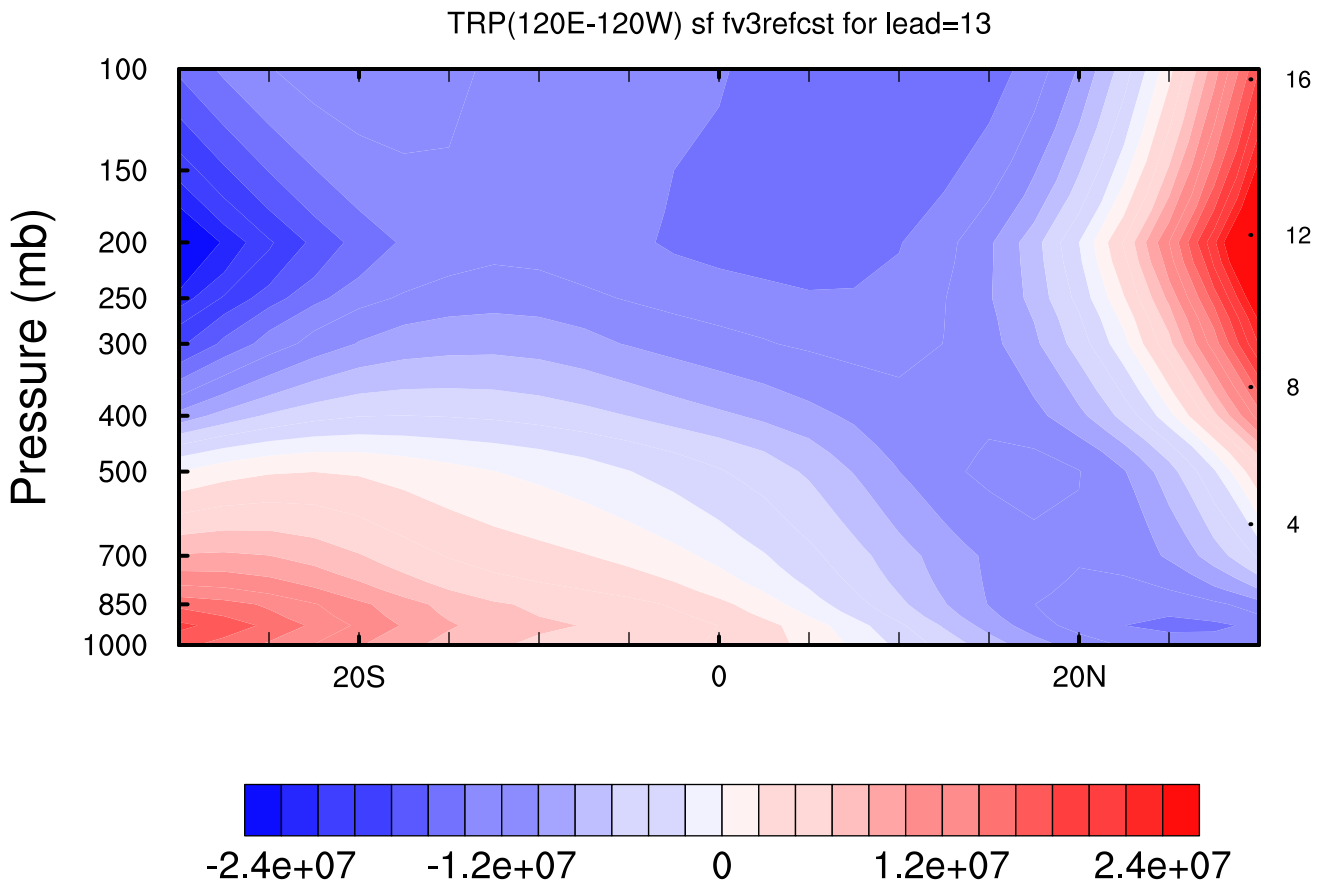

TR(5S-5N) sf fv3refcst for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

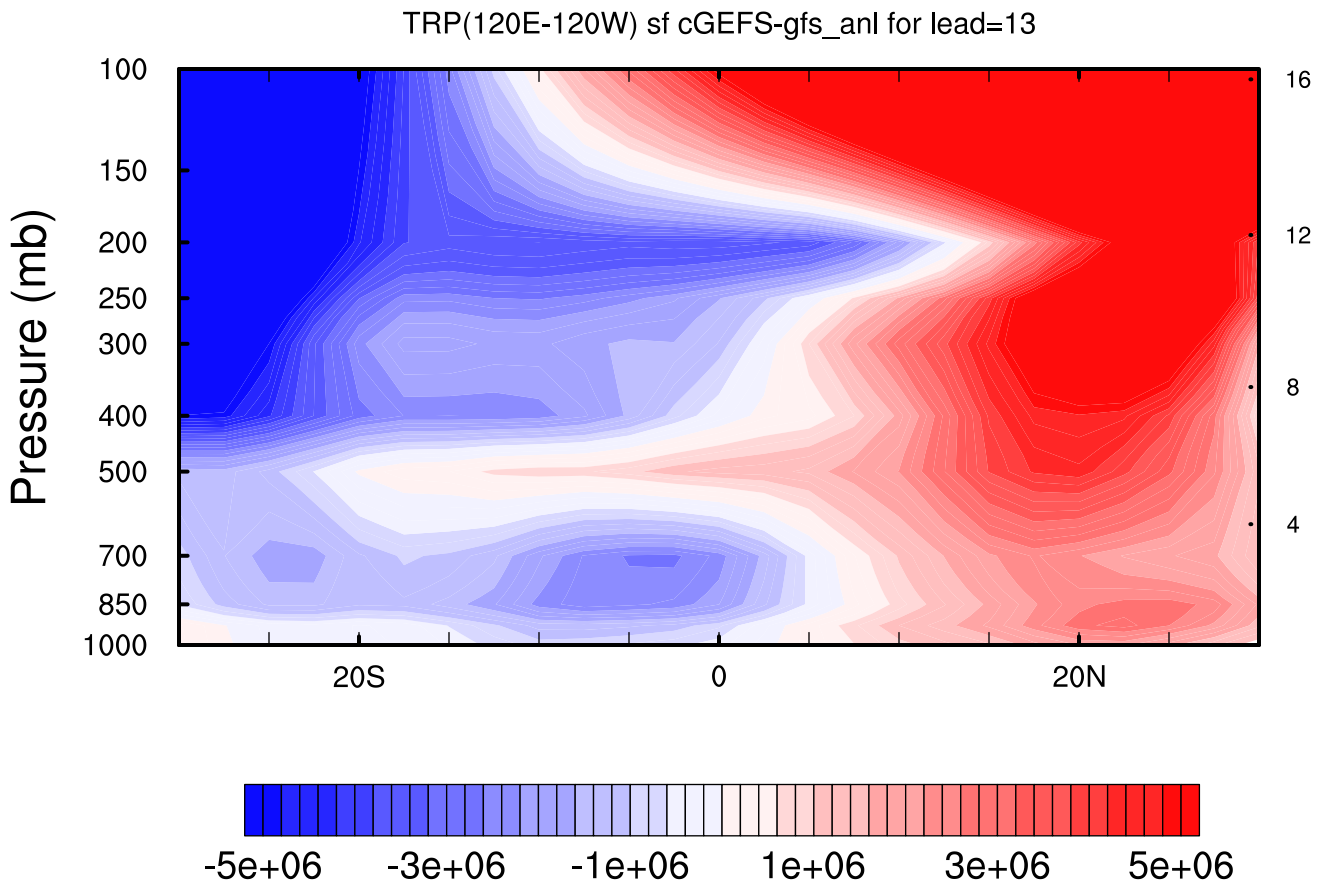

TR(5S-5N) sf cGEFS-gfs_anl for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

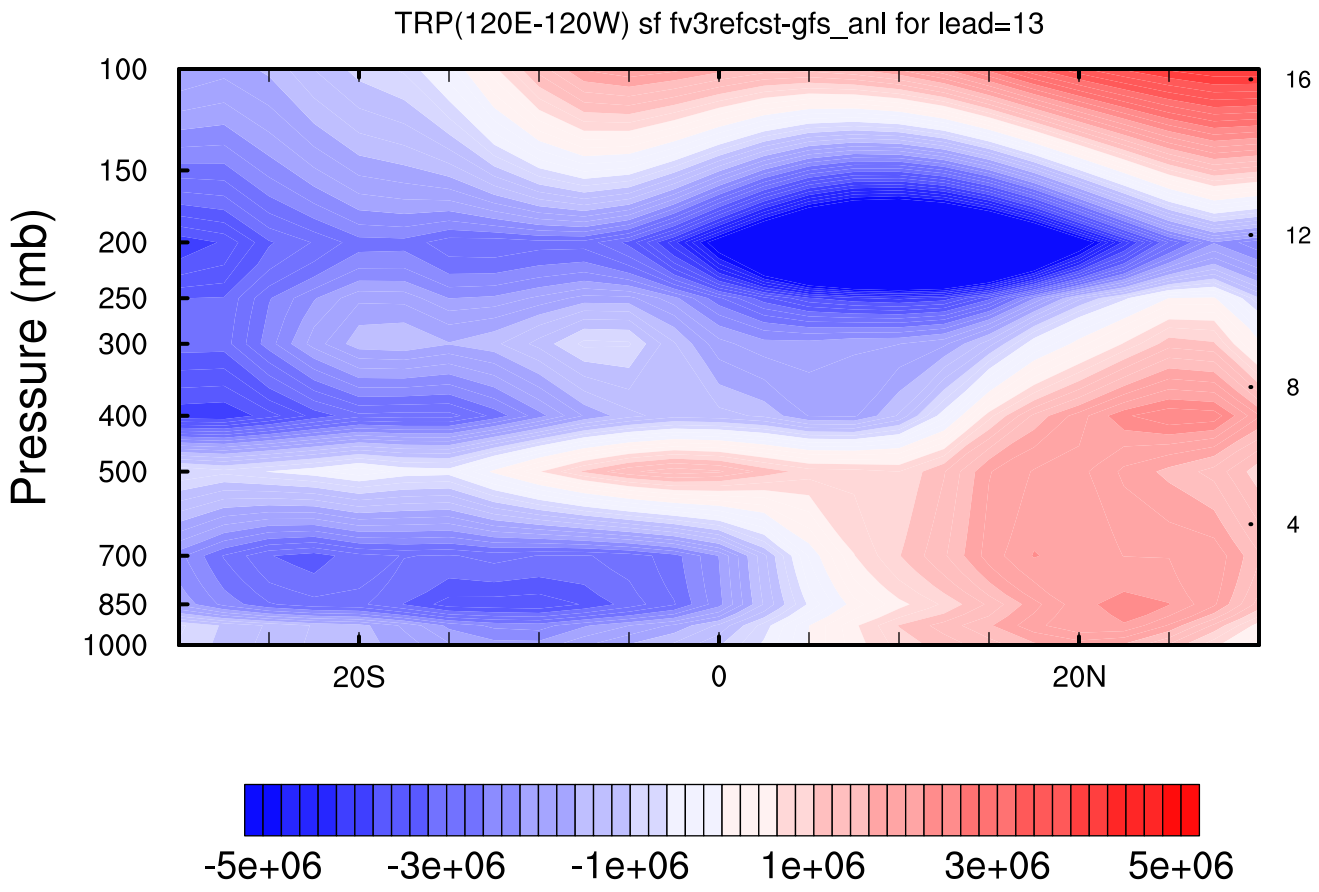

TR(5S-5N) sf fv3refcst-gfs_anl for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

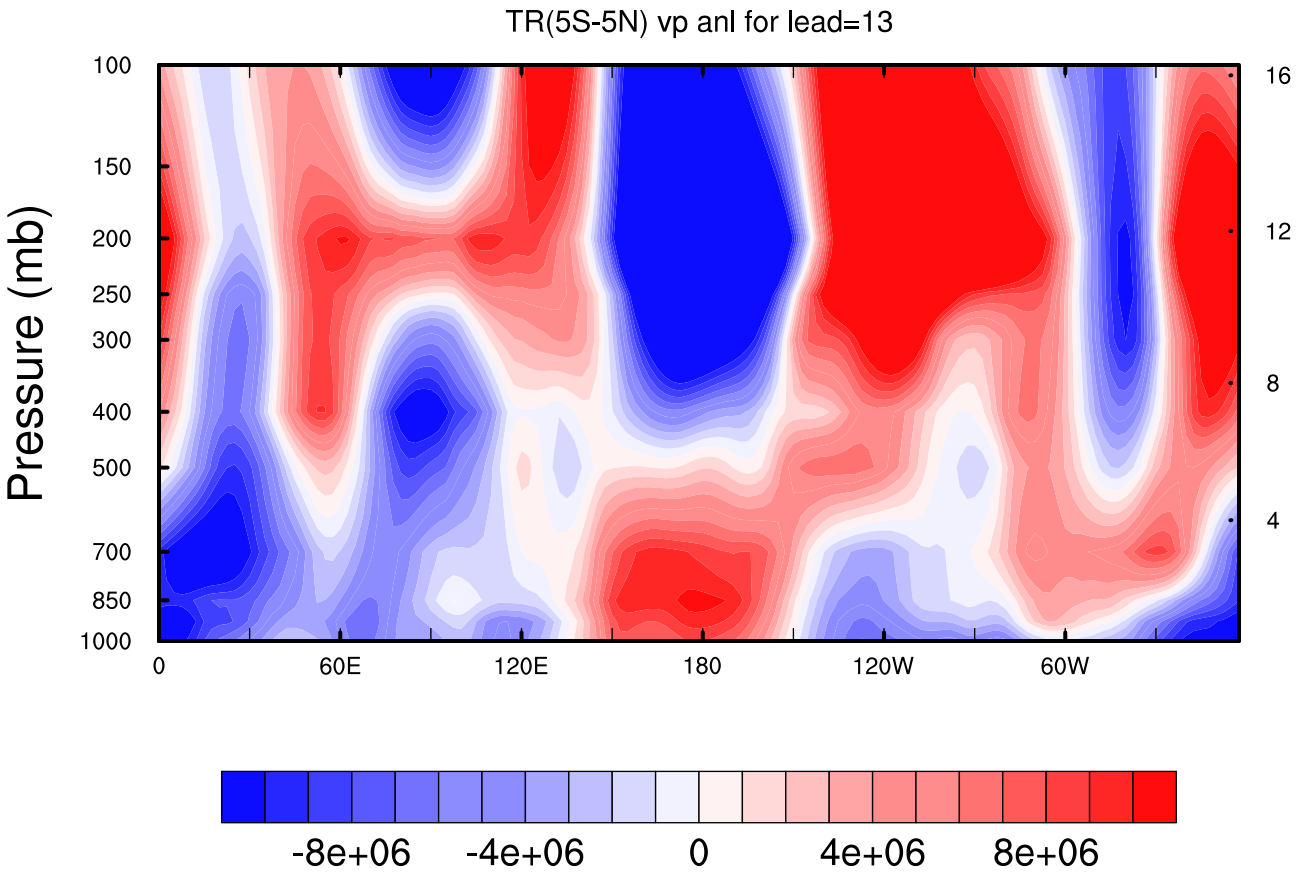

TRP(120E-120W) sf anl for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

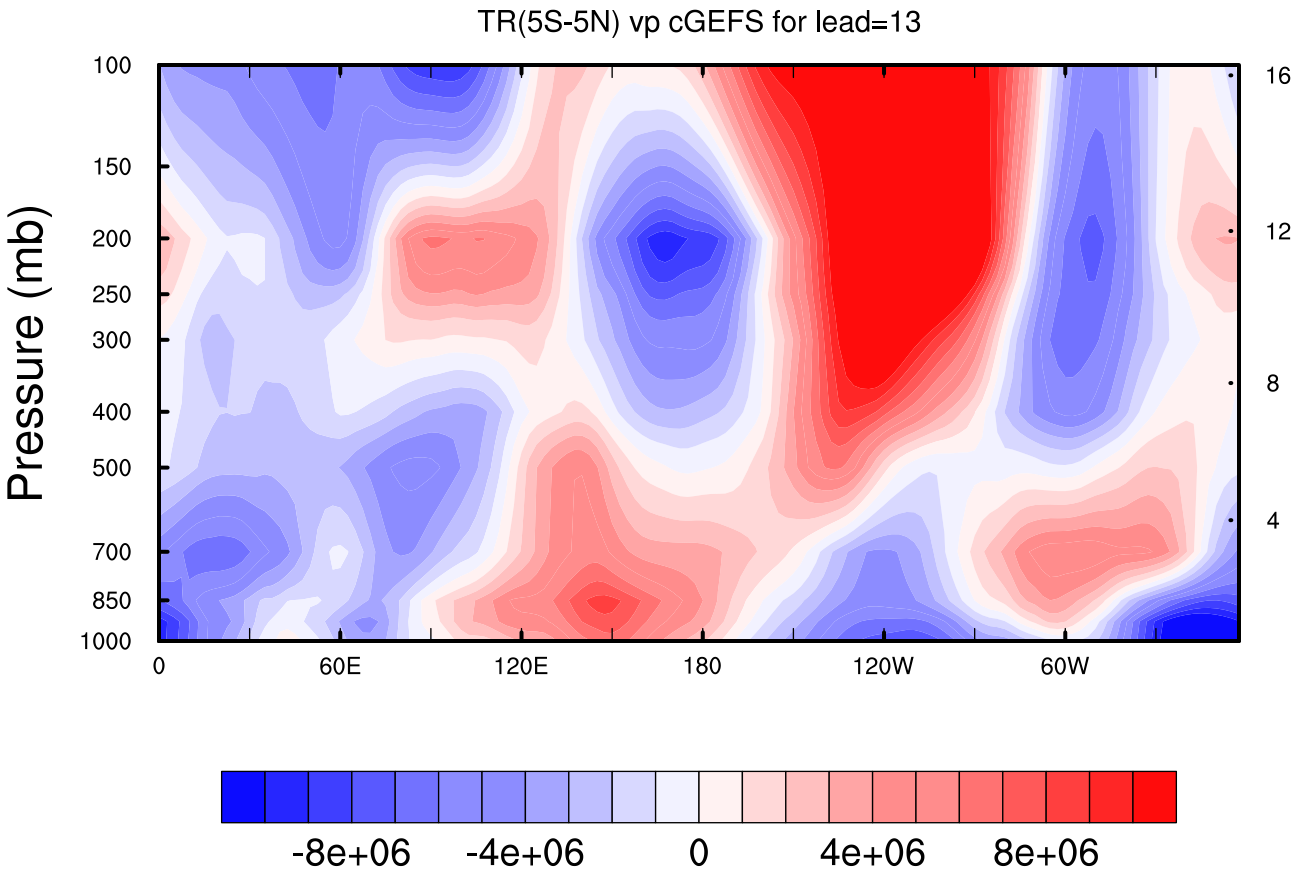

TRP(120E-120W) sf cGEFS for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

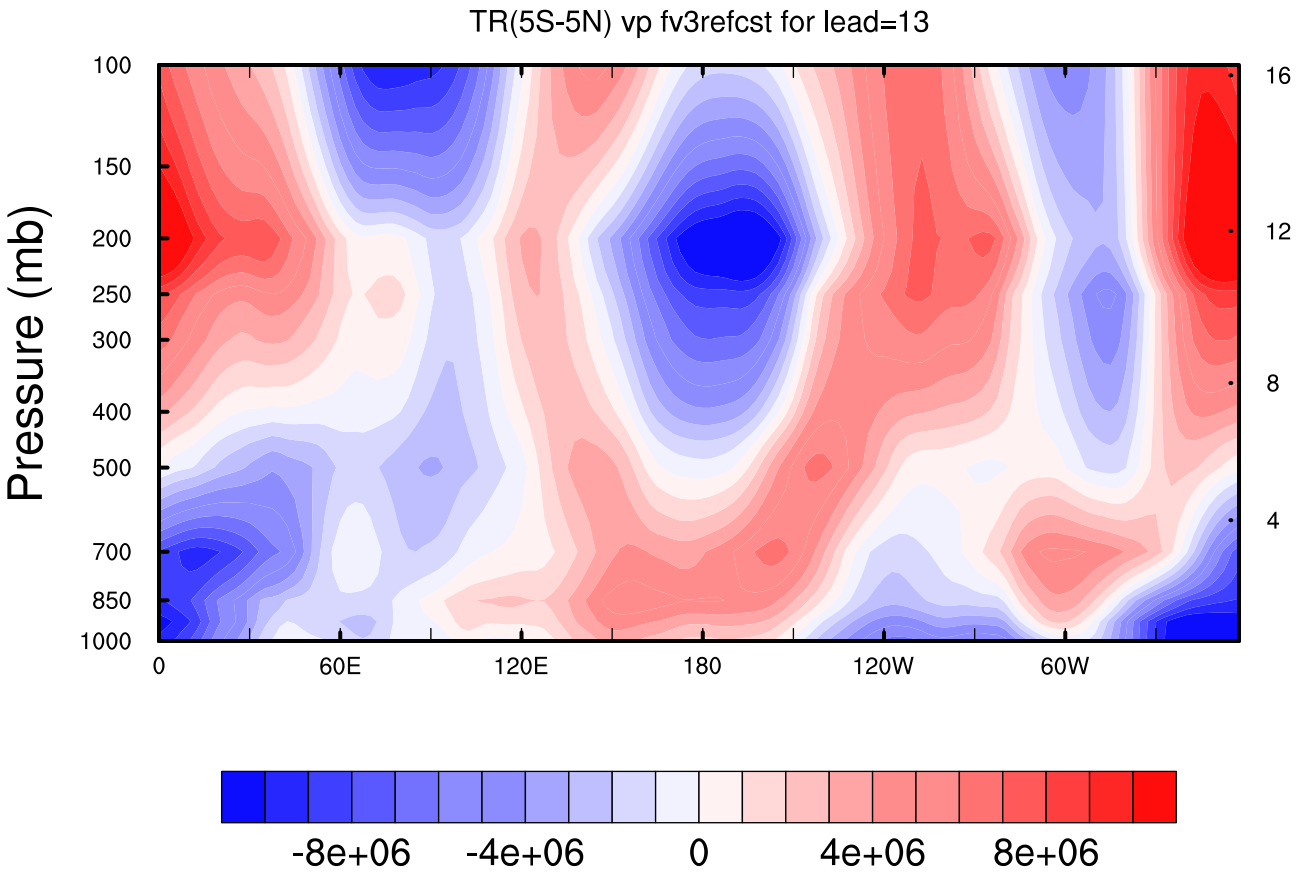

TRP(120E-120W) sf fv3refcst for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

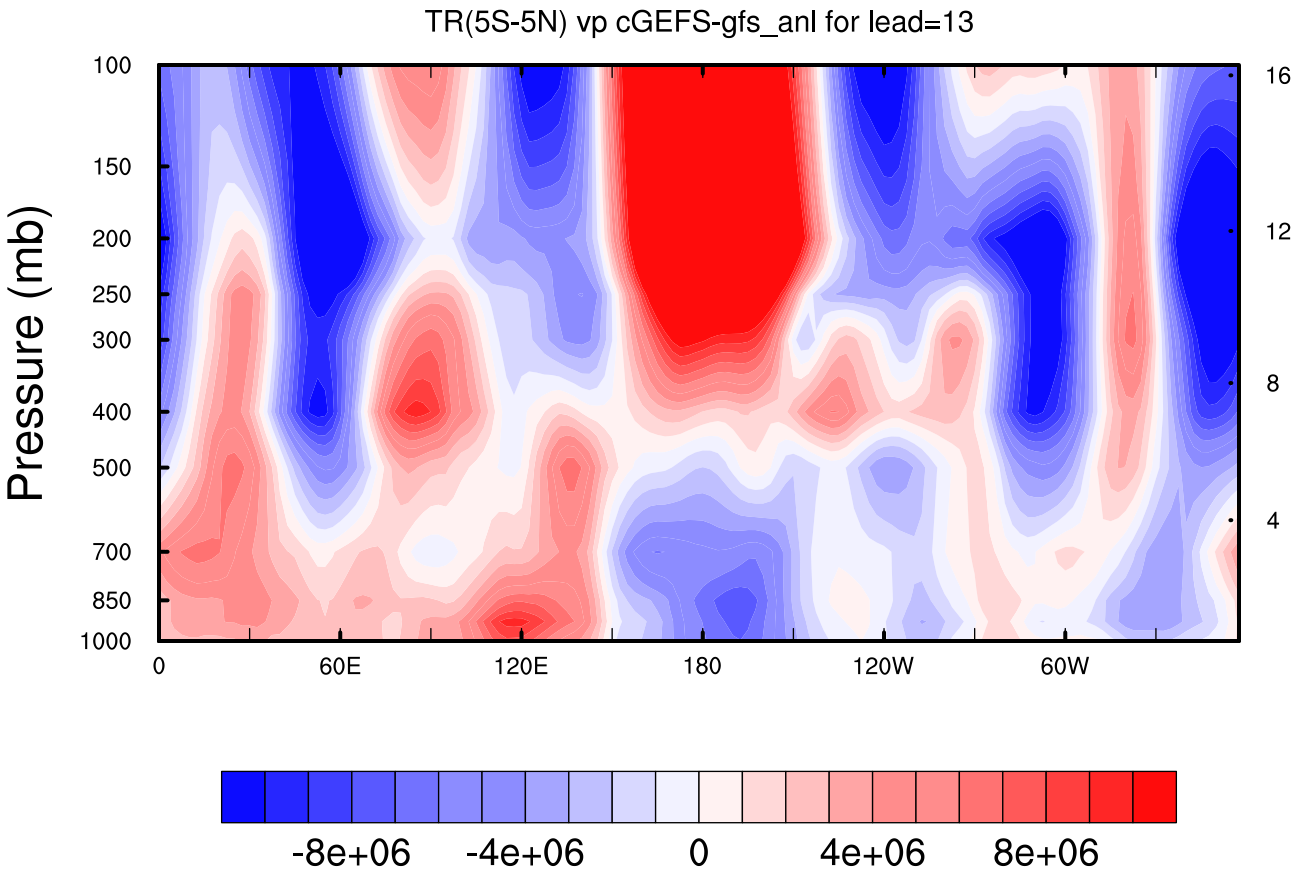

TRP(120E-120W) sf cGEFS-gfs_anl for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

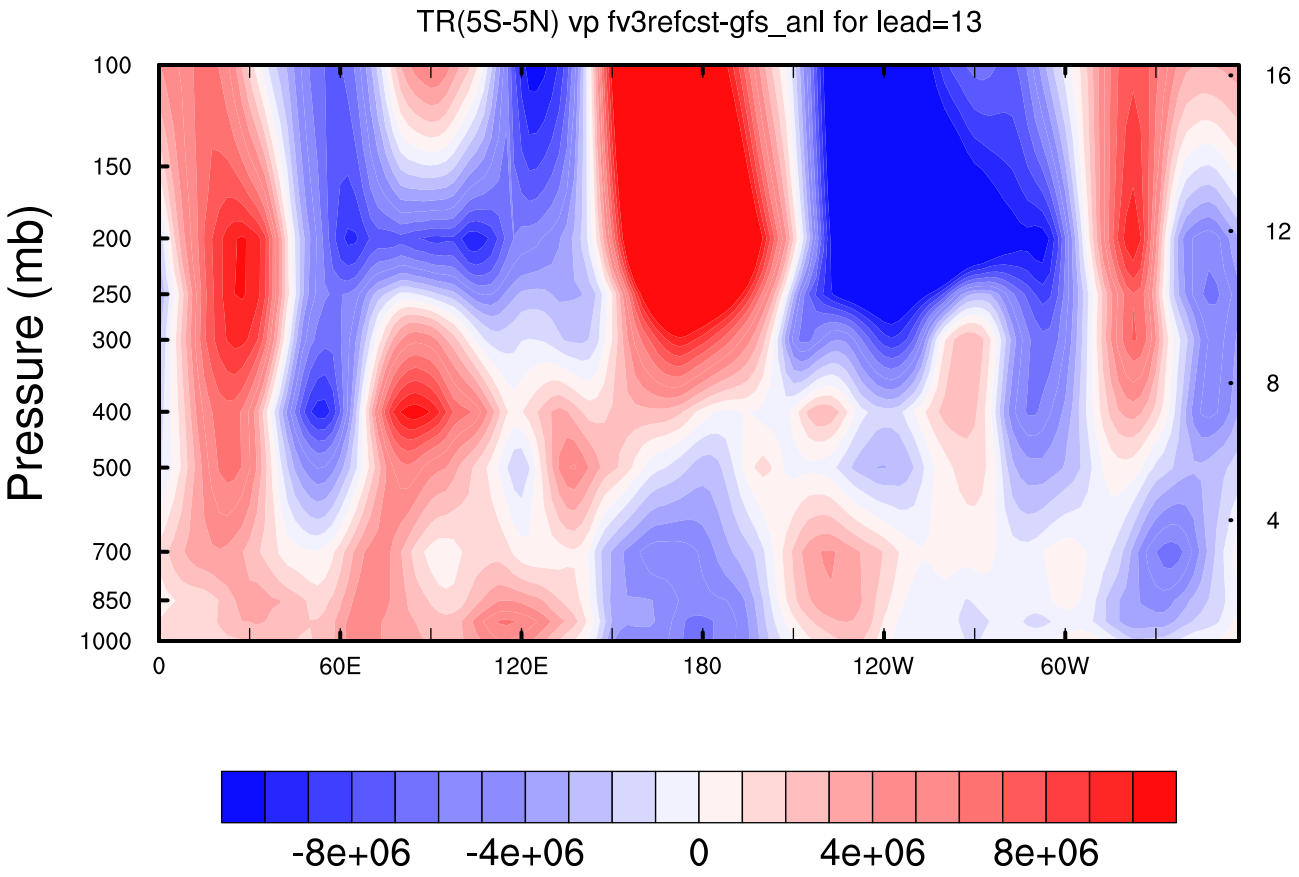

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06


TR(5S-5N) vp anl for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS-gfs_anl for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst-gfs_anl for lead=13
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
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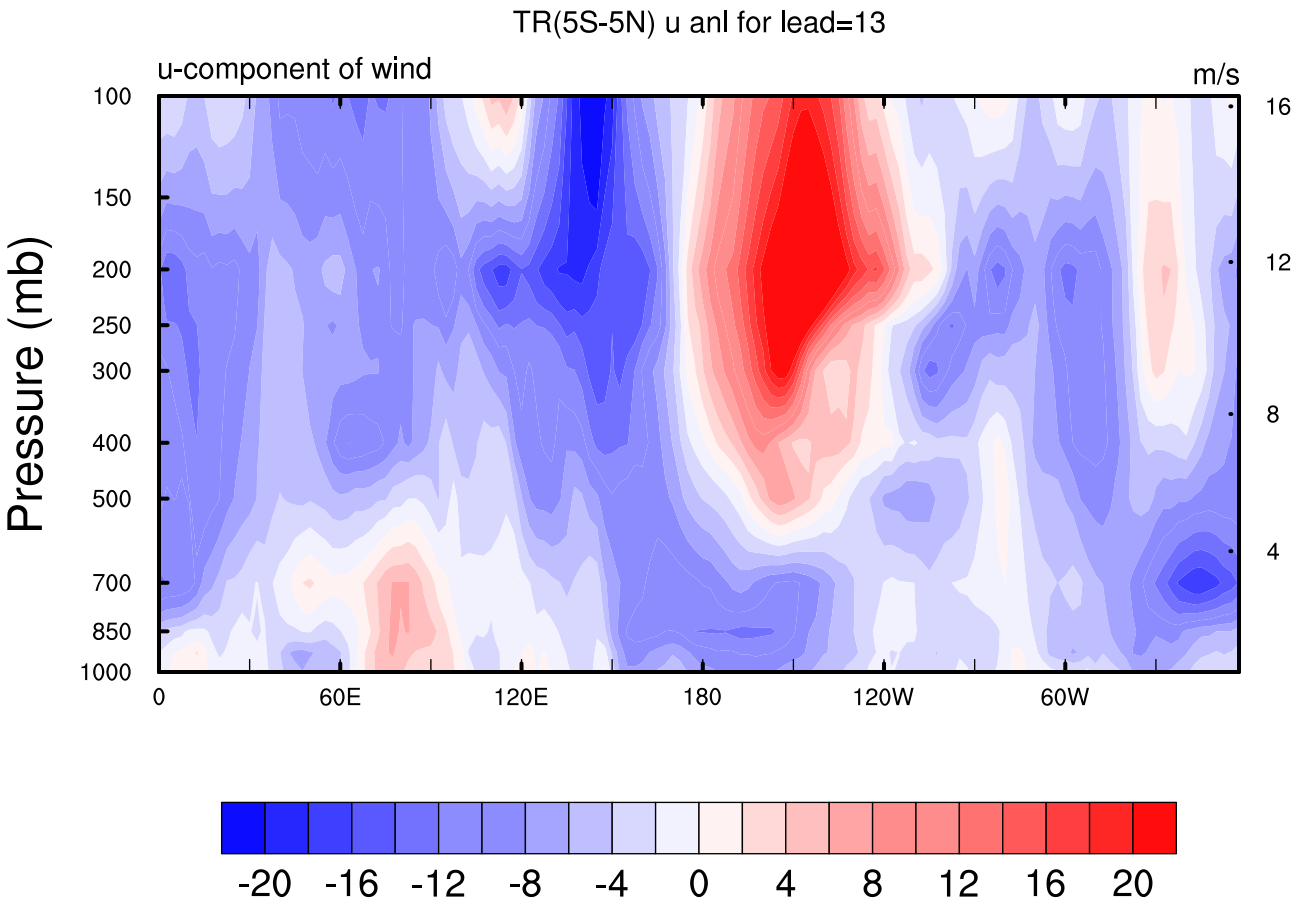
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) u anl for lead=13
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
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-4
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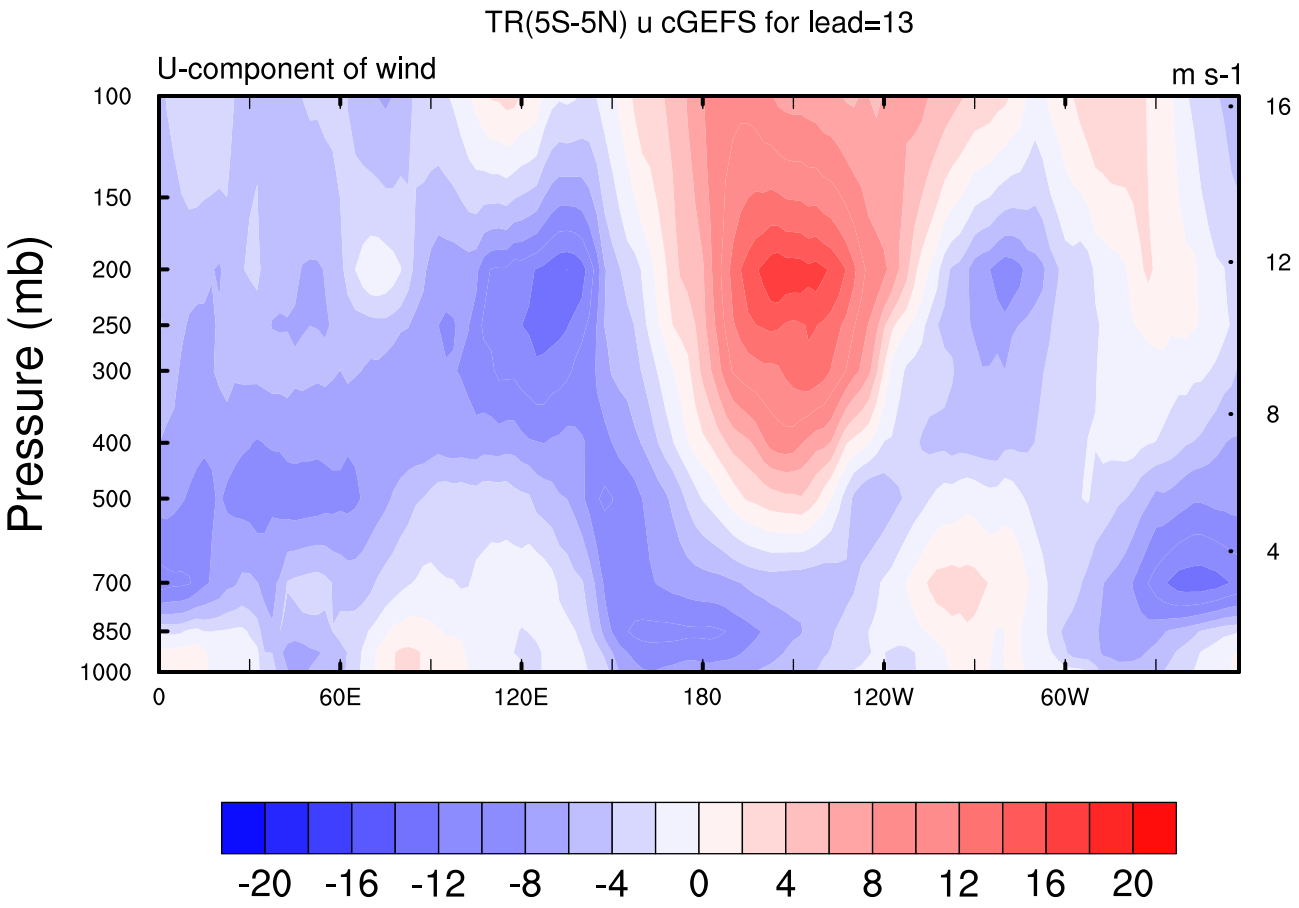
4
8
12
16
20


TR(5S-5N) u cGEFS for lead=13
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
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8
4
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-12
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-4
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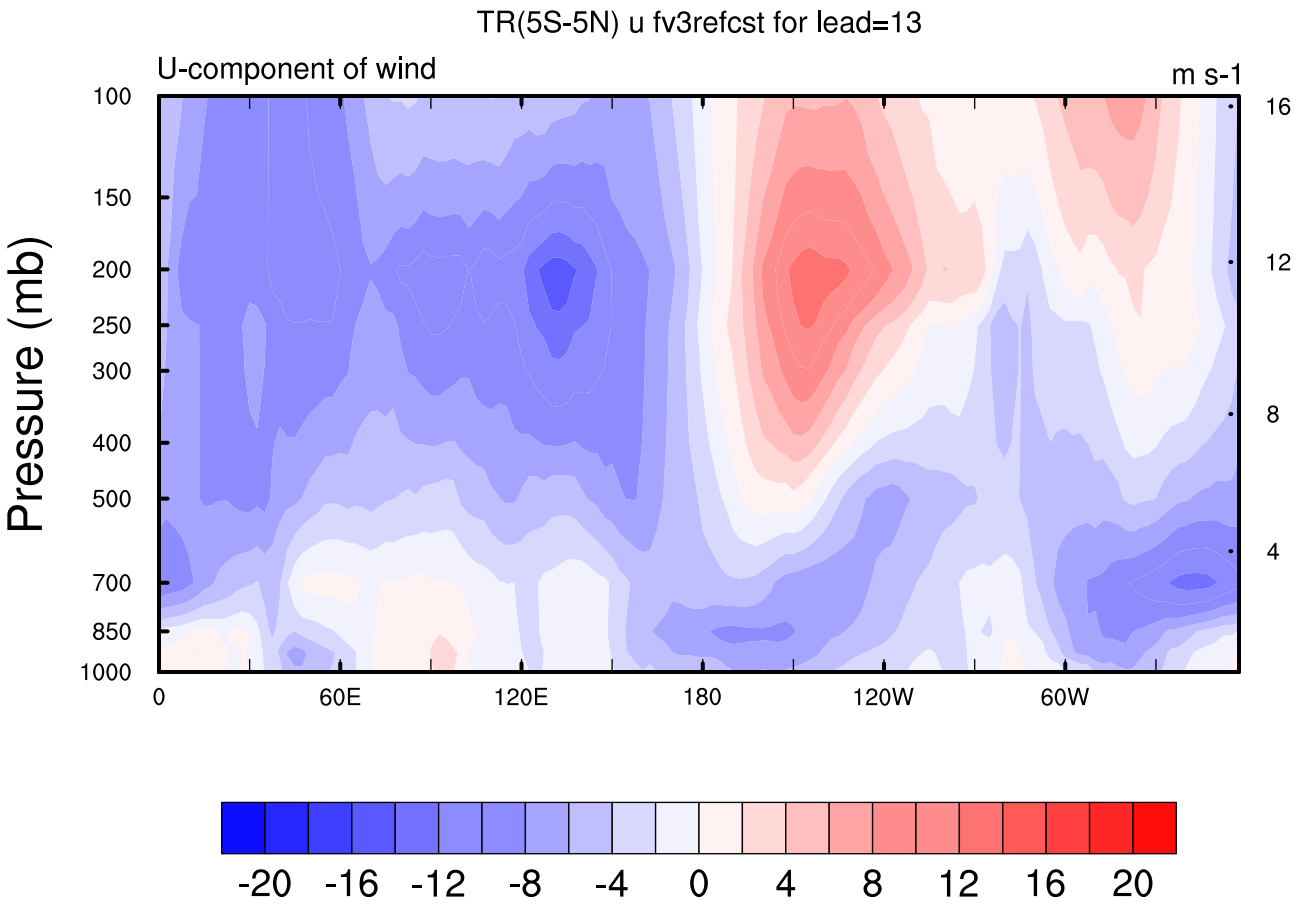
4
8
12
16
20


TR(5S-5N) u fv3refcst for lead=13
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
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500
700
850
1000
0
60E
120E
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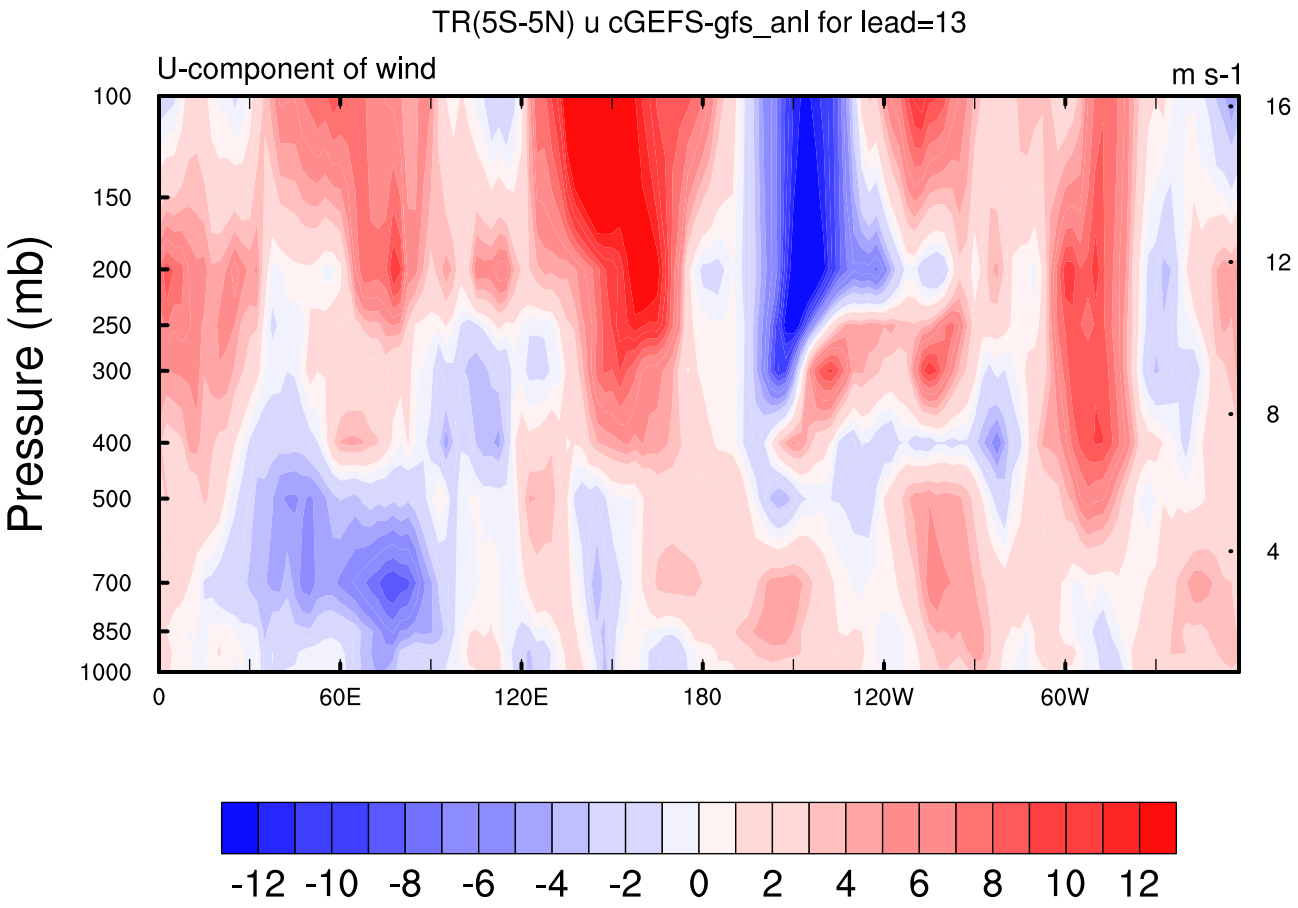
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=13
U-component of wind
m s-1
Pressure (mb)
100
150
200
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500
700
850
1000
0
60E
120E
180
120W
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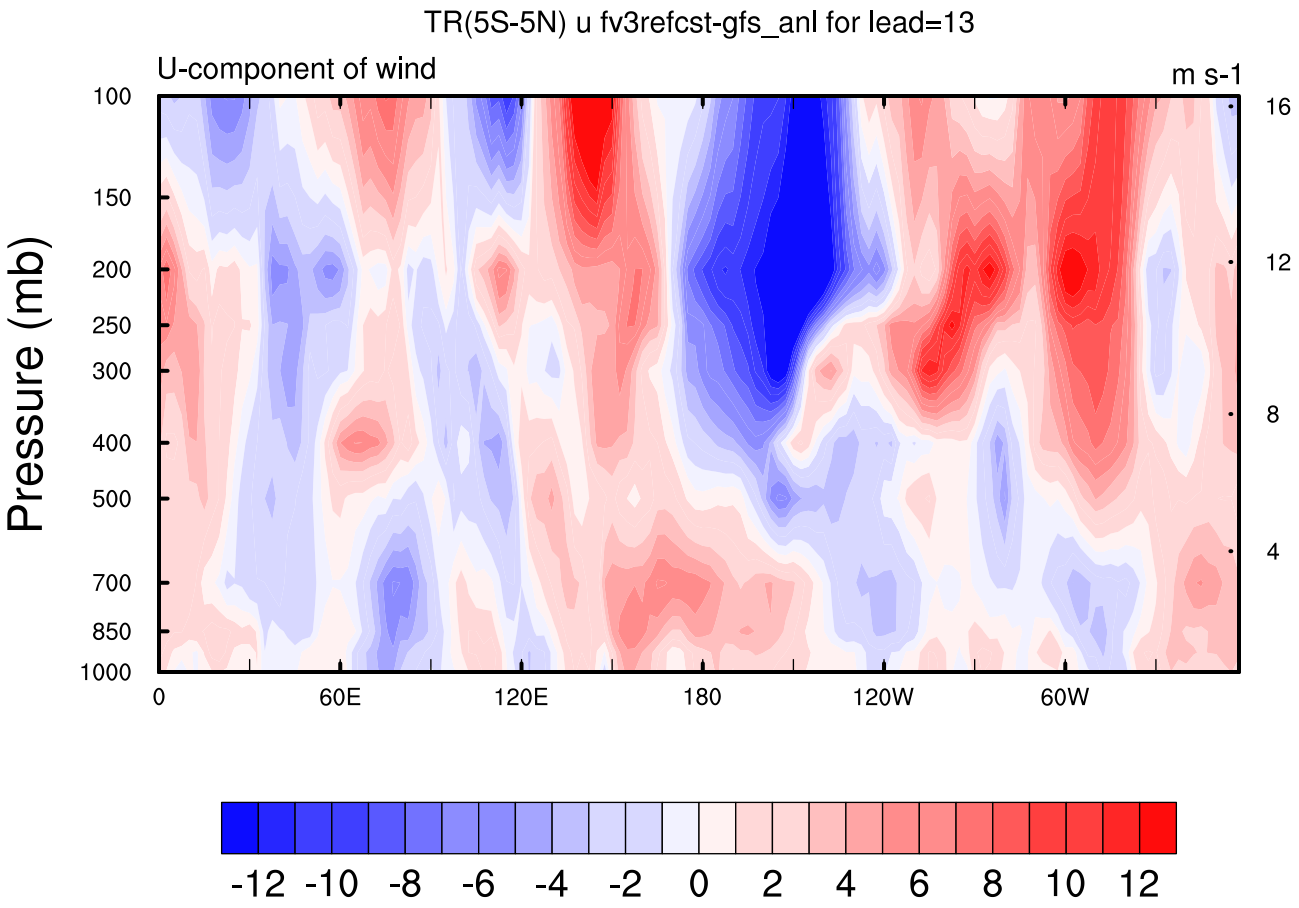
TR(5S-5N) u fv3refcst-gfs_anl for lead=13
U-component of wind
m s-1
Pressure (mb)
100
150
200
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400
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700
850
1000
0
60E
120E
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120W
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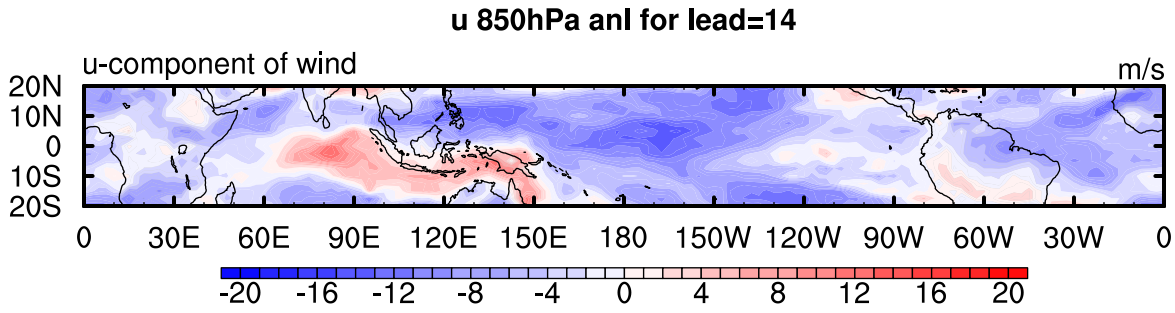
u 850hPa anl for lead=14
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-8
-4
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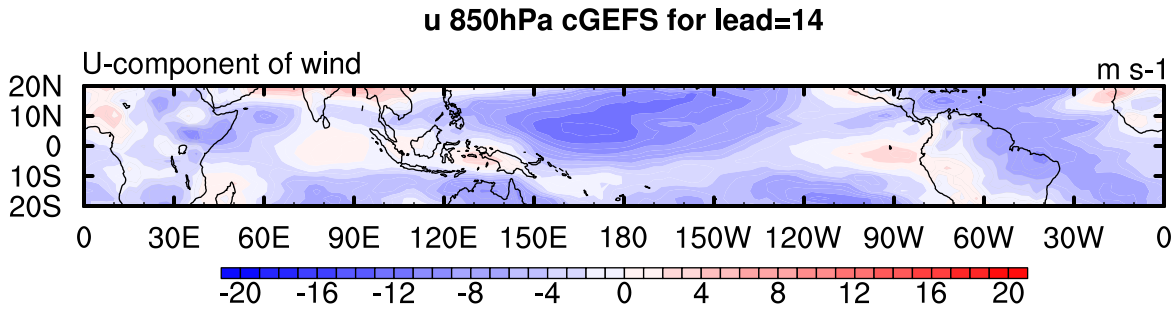
8
12
16
20


u 850hPa cGEFS for lead=14
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-4
0
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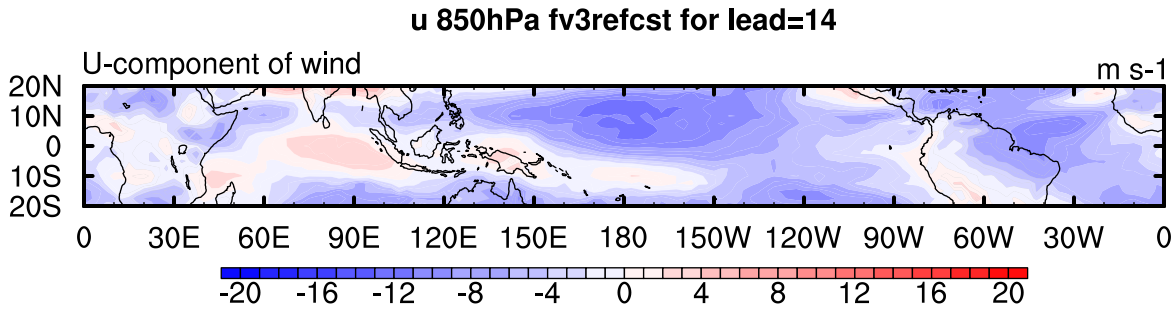
16
20


u 850hPa fv3refcst for lead=14
U-component of wind
m s-1
20N
10N
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10S
20S
0
30E
60E
90E
120E
150E
180
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16
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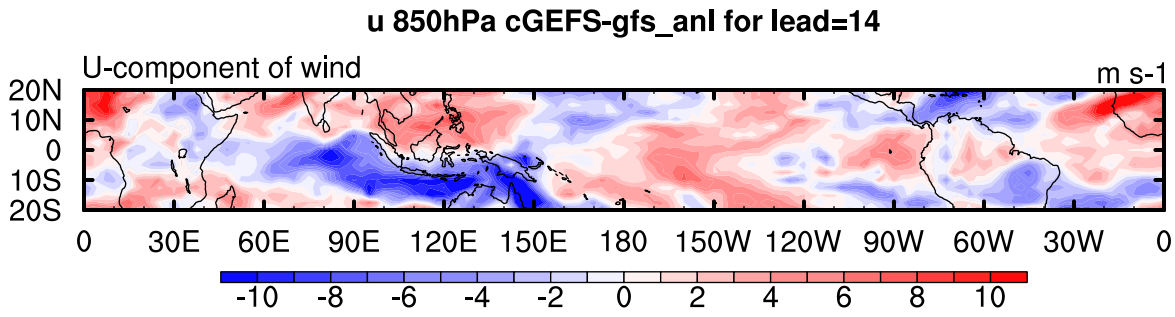
u 850hPa cGEFS-gfs_anl for lead=14
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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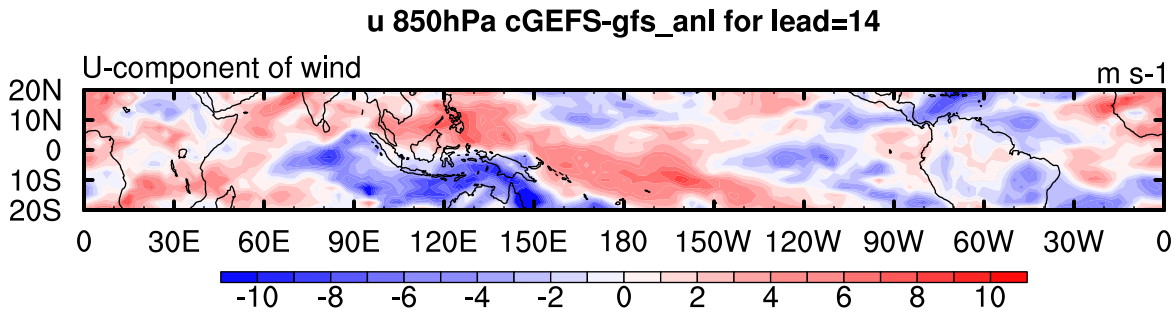
u 850hPa cGEFS-gfs_anl for lead=14
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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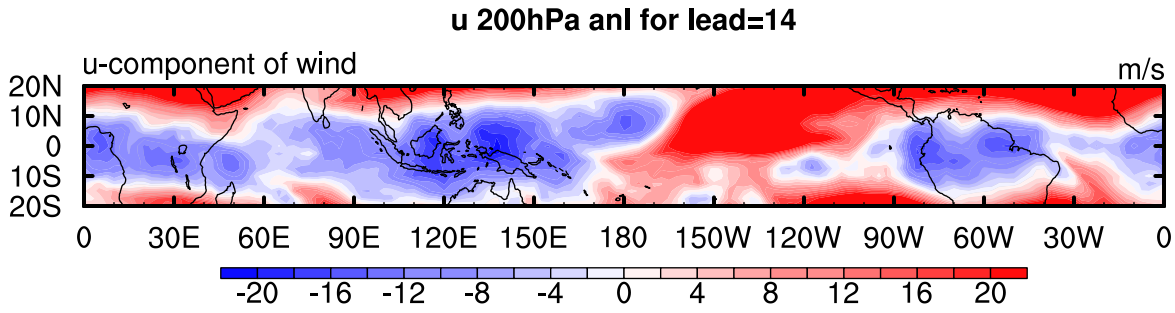
u 200hPa anl for lead=14
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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16
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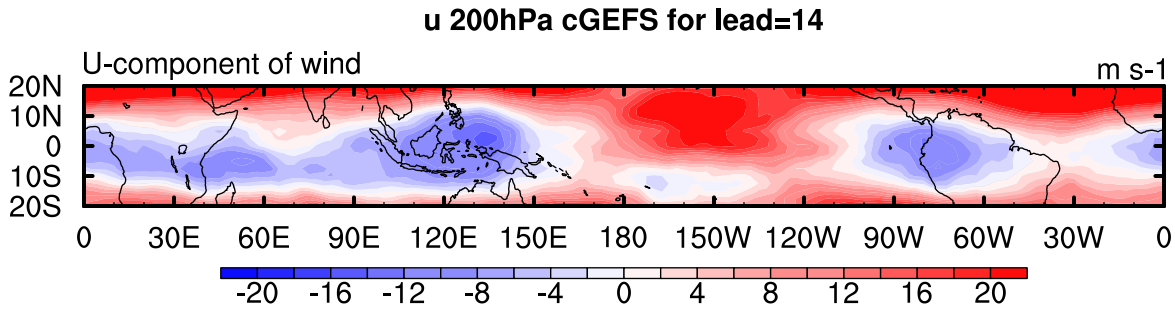
u 200hPa cGEFS for lead=14
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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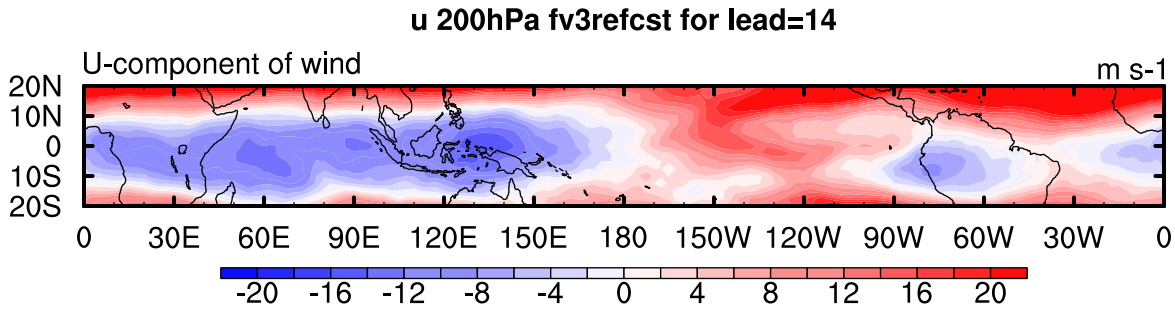
u 200hPa fv3refcst for lead=14
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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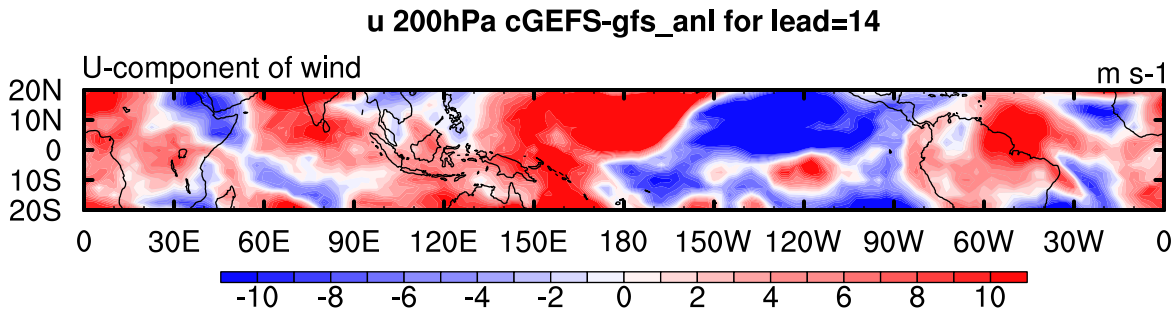
u 200hPa cGEFS-gfs_anl for lead=14
U-component of wind
m s-1
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10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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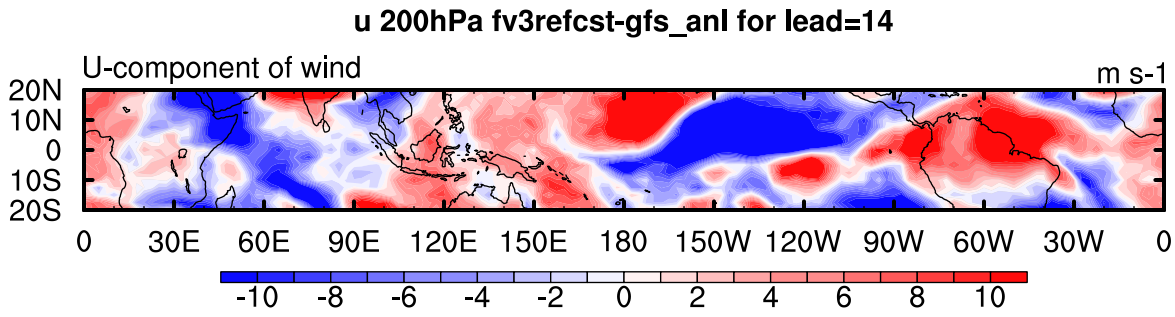
u 200hPa fv3refcst-gfs_anl for lead=14
U-component of wind
m s-1
20N
10N
0
10S
20S
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30E
60E
90E
120E
150E
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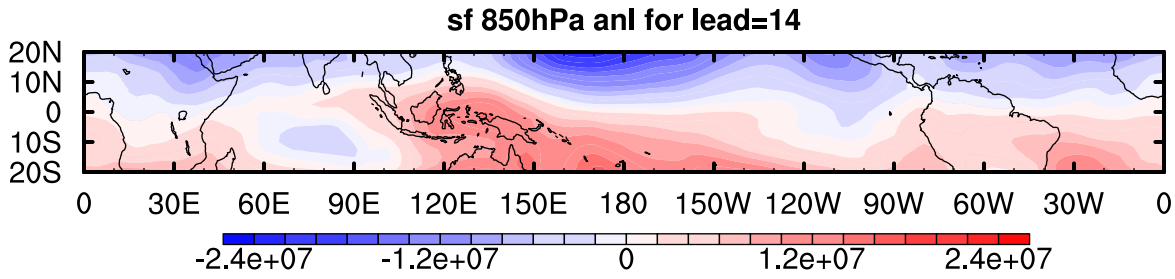
sf 850hPa anl for lead=14
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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60W
30W
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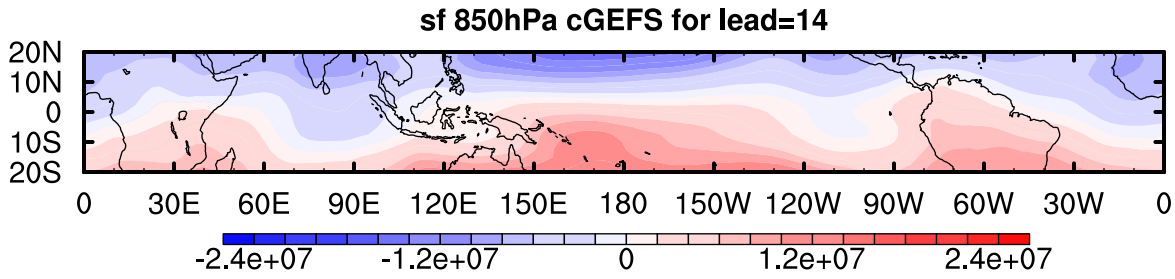
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=14
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10S
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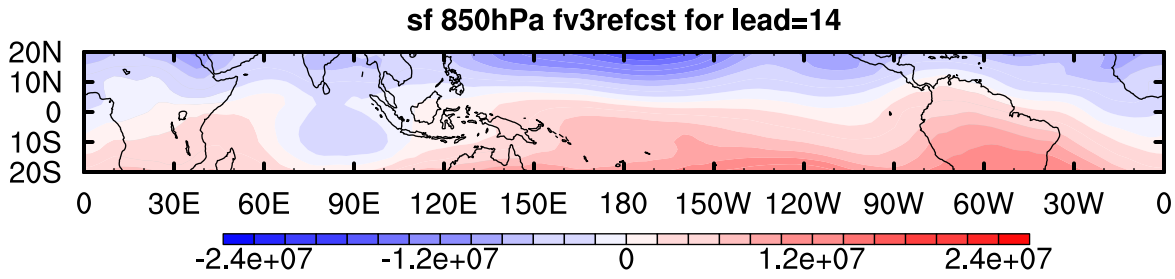
2.4e+07


sf 850hPa fv3refcst for lead=14
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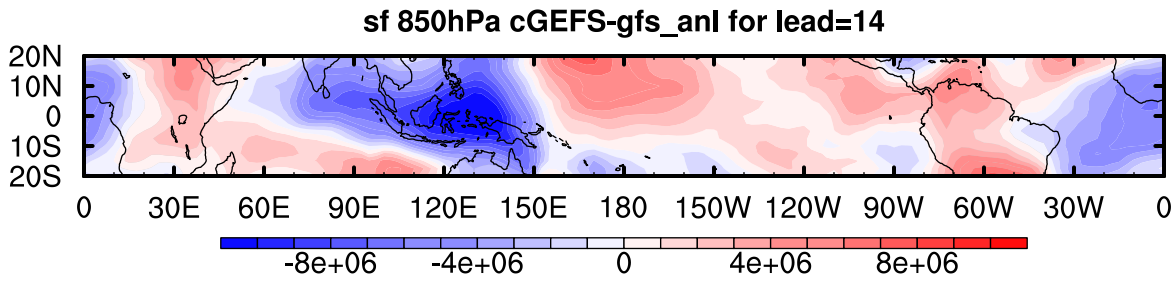
sf 850hPa cGEFS-gfs_anl for lead=14
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10S
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90E
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30W
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-4e+06
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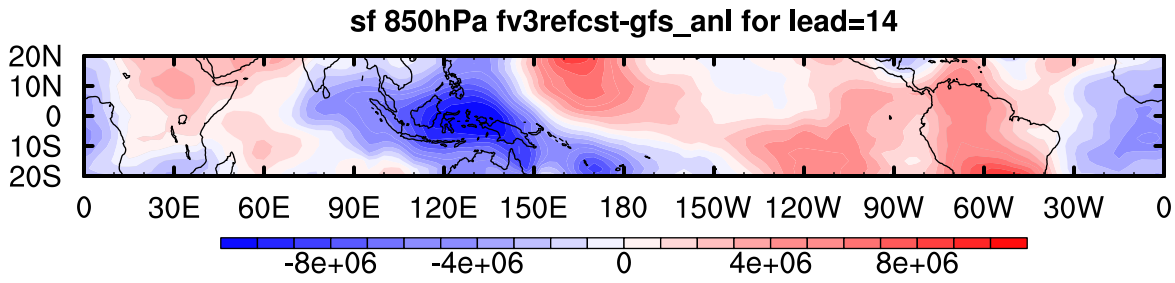
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=14
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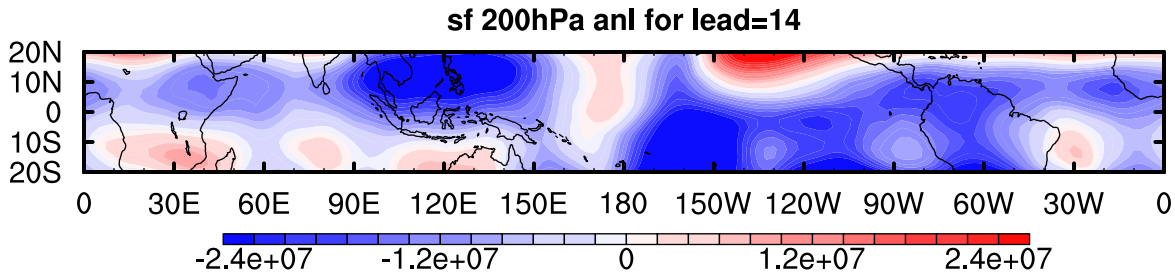
sf 200hPa anl for lead=14
20N
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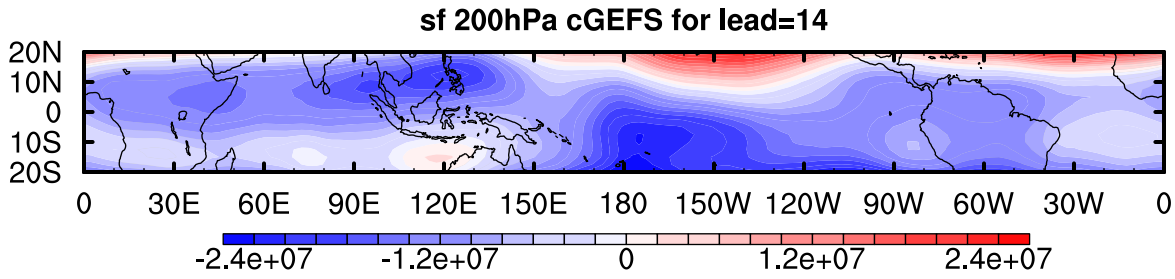
2.4e+07


sf 200hPa cGEFS for lead=14
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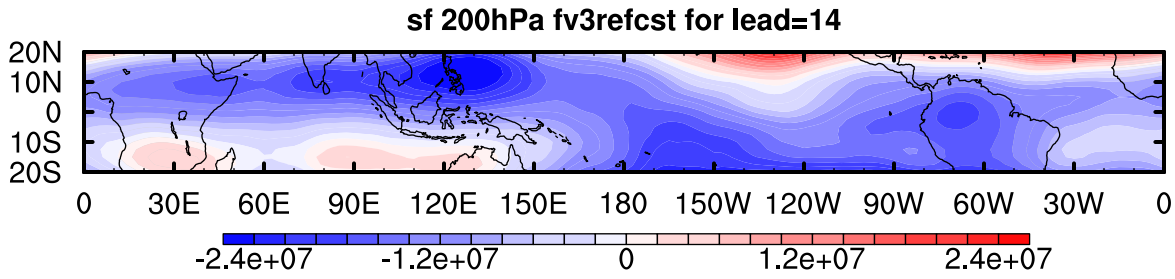
sf 200hPa fv3refcst for lead=14
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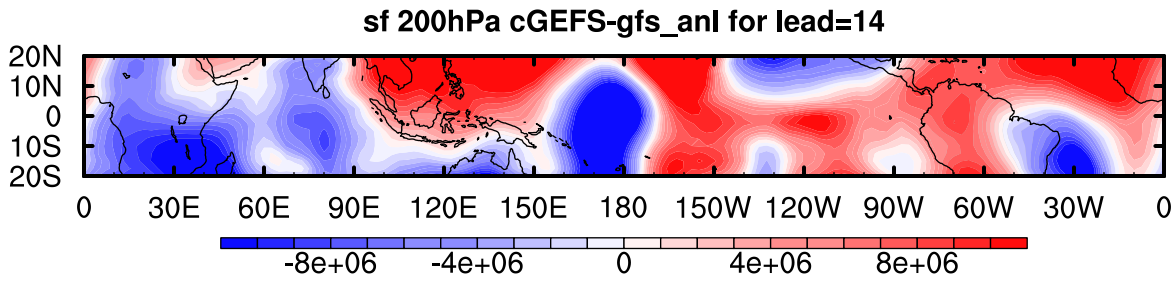
2.4e+07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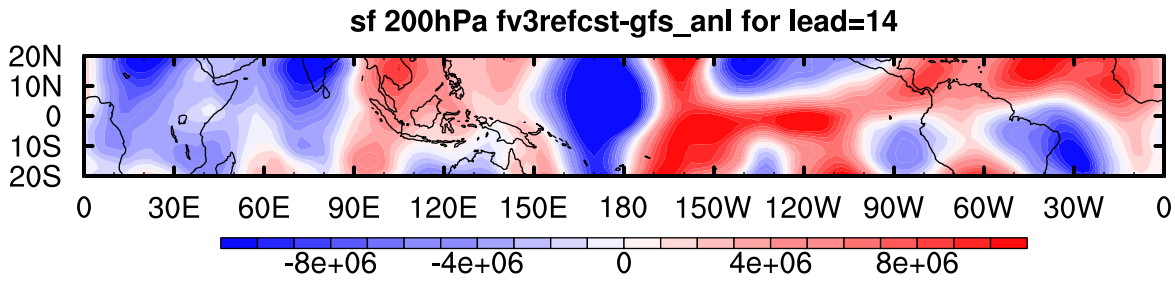
sf 200hPa fv3refcst-gfs_anl for lead=14
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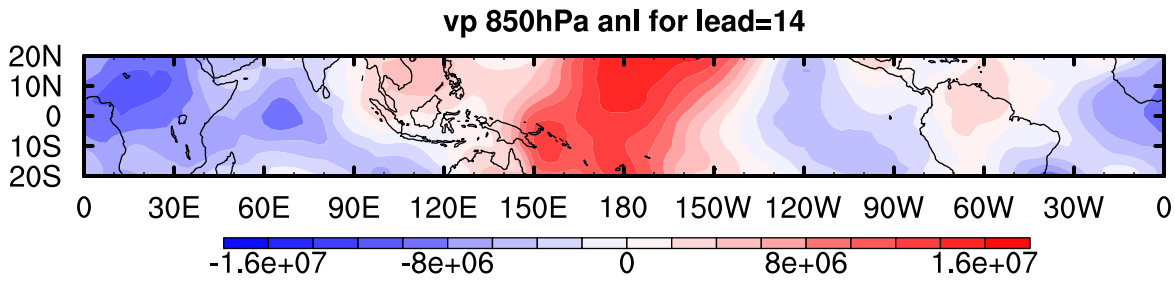
vp 850hPa anl for lead=14
20N
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10S
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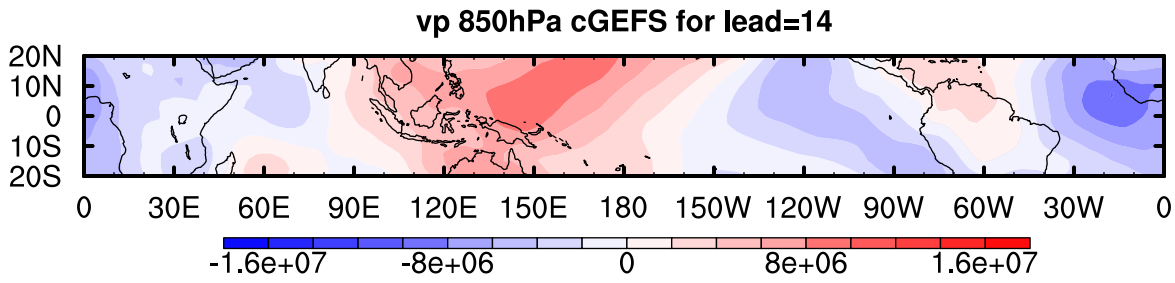
1.6e+07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30W
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-1.6e+07
-8e+06
0
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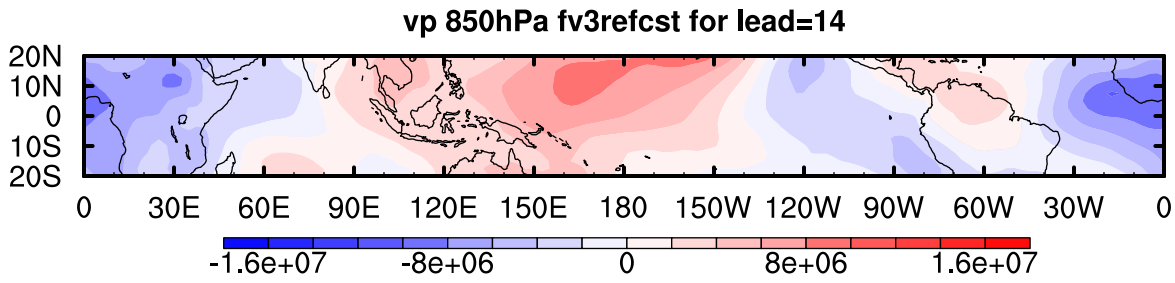
1.6e+07


vp 850hPa fv3refcst for lead=14
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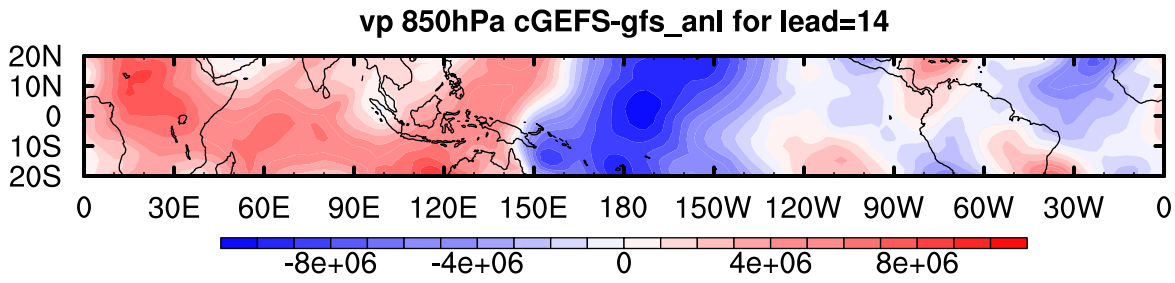
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=14
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10S
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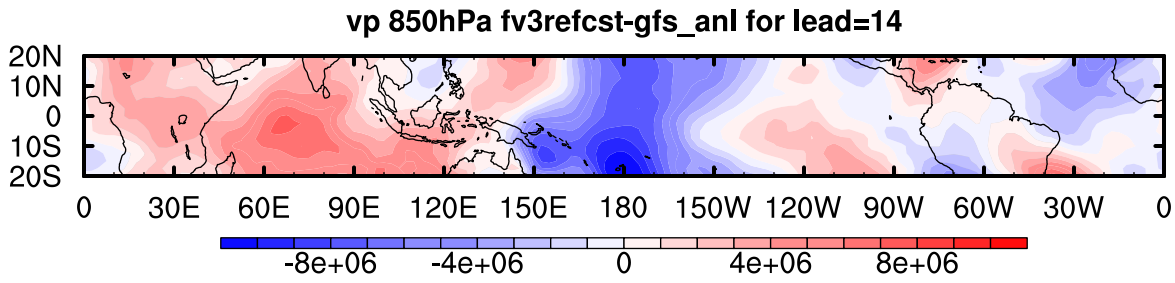
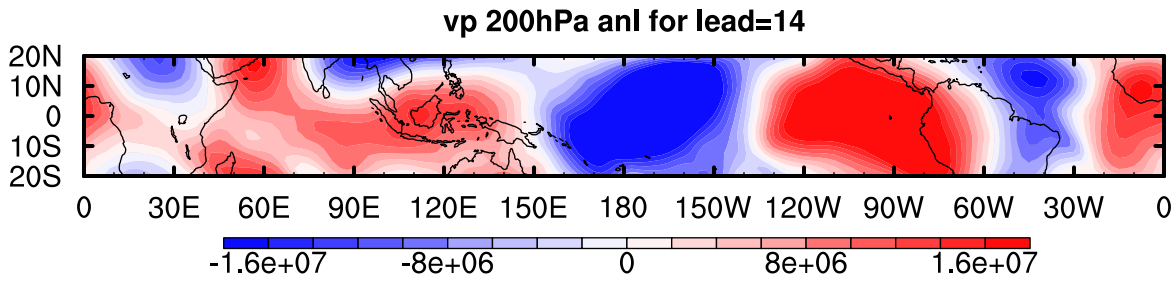
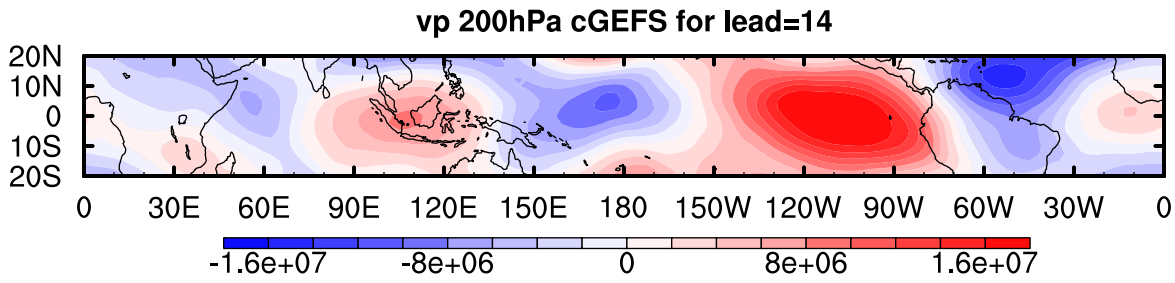
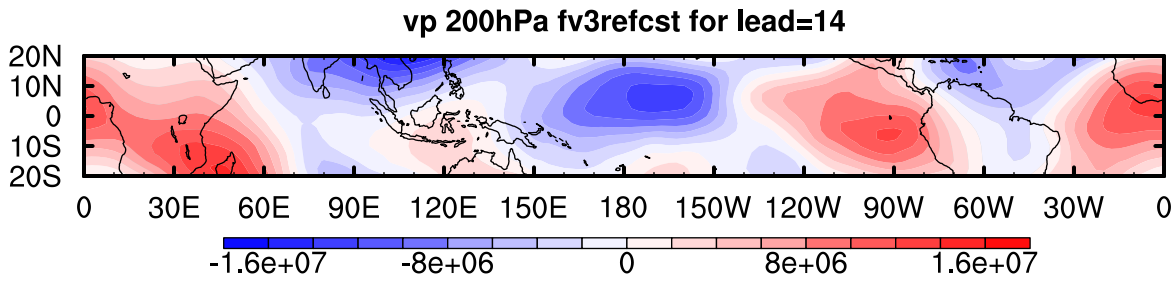
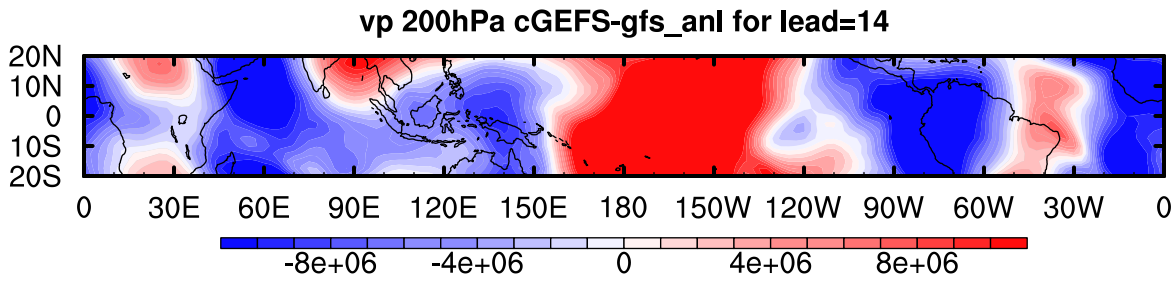
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

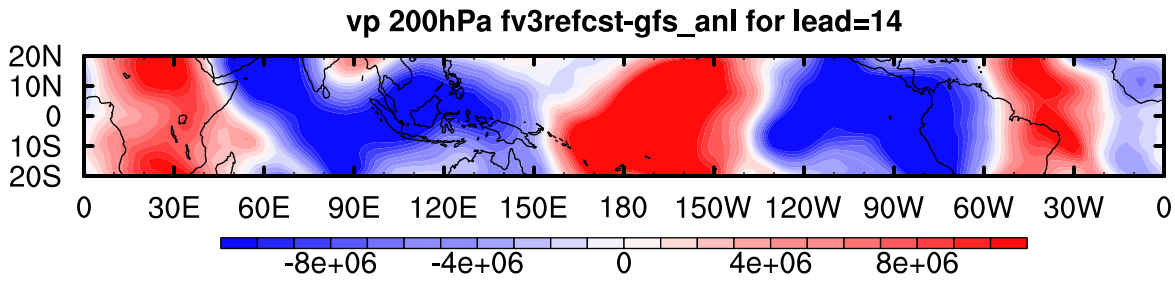

vp 850hPa fv3refcst-gfs_anl for lead=14
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

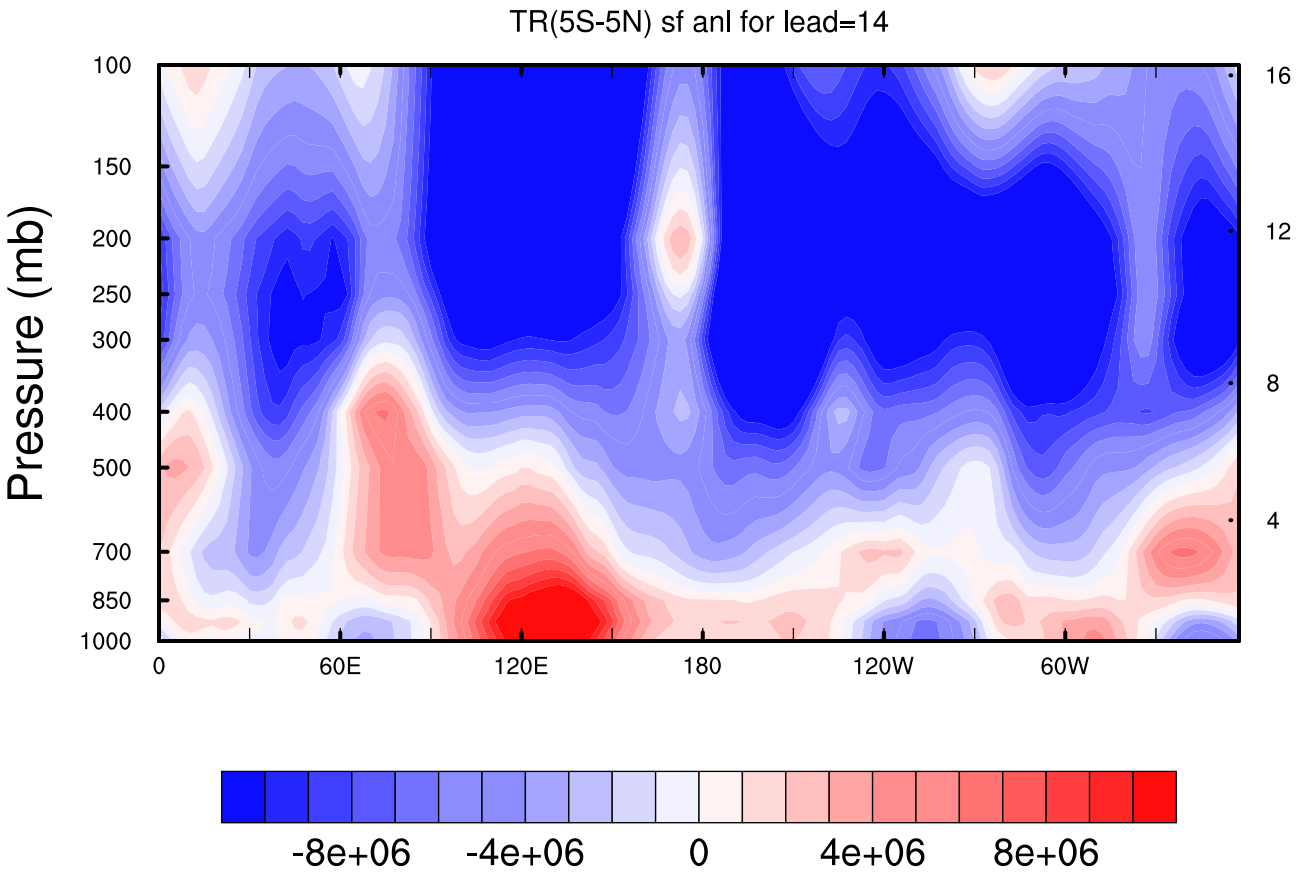

vp 200hPa anl for lead=14
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

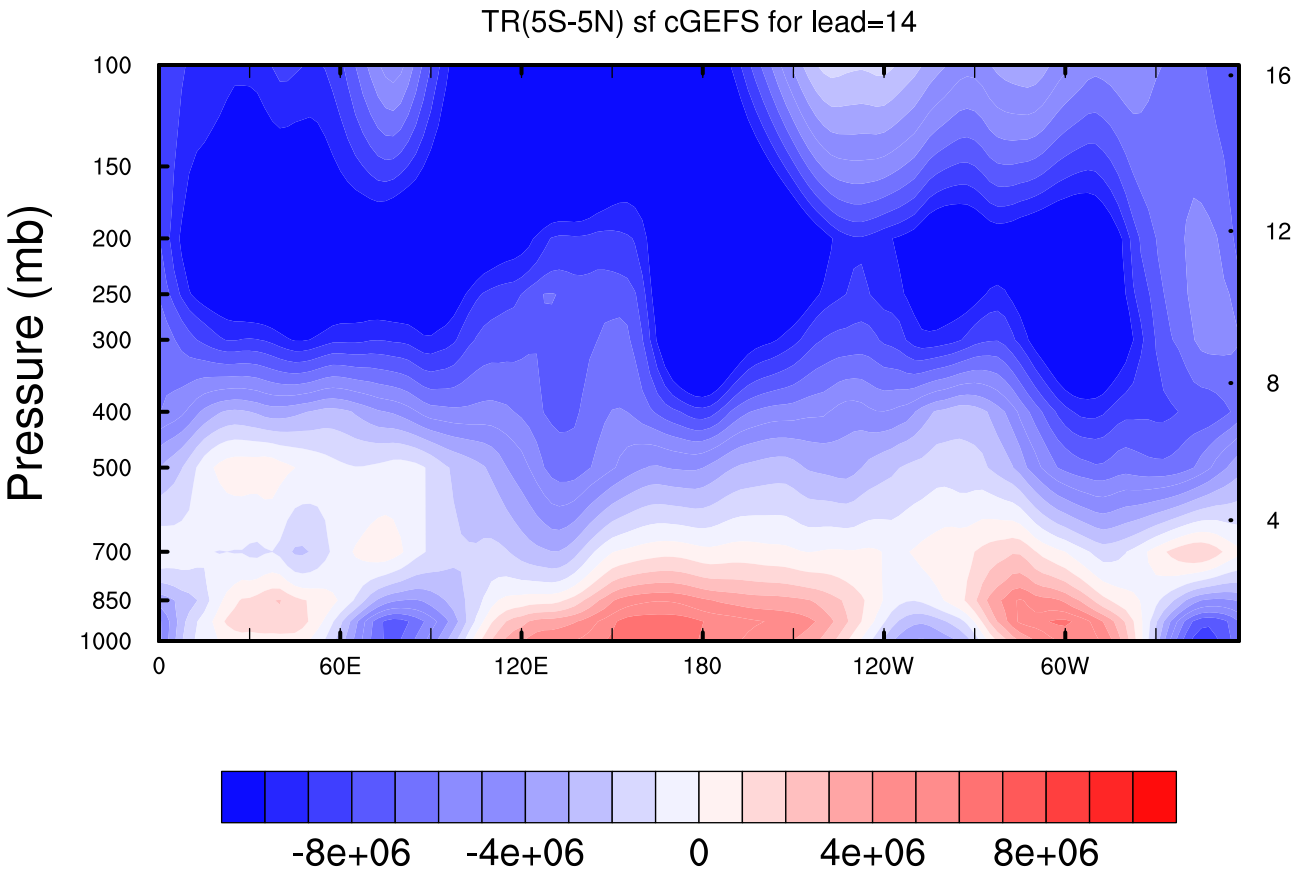

vp 200hPa cGEFS for lead=14
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

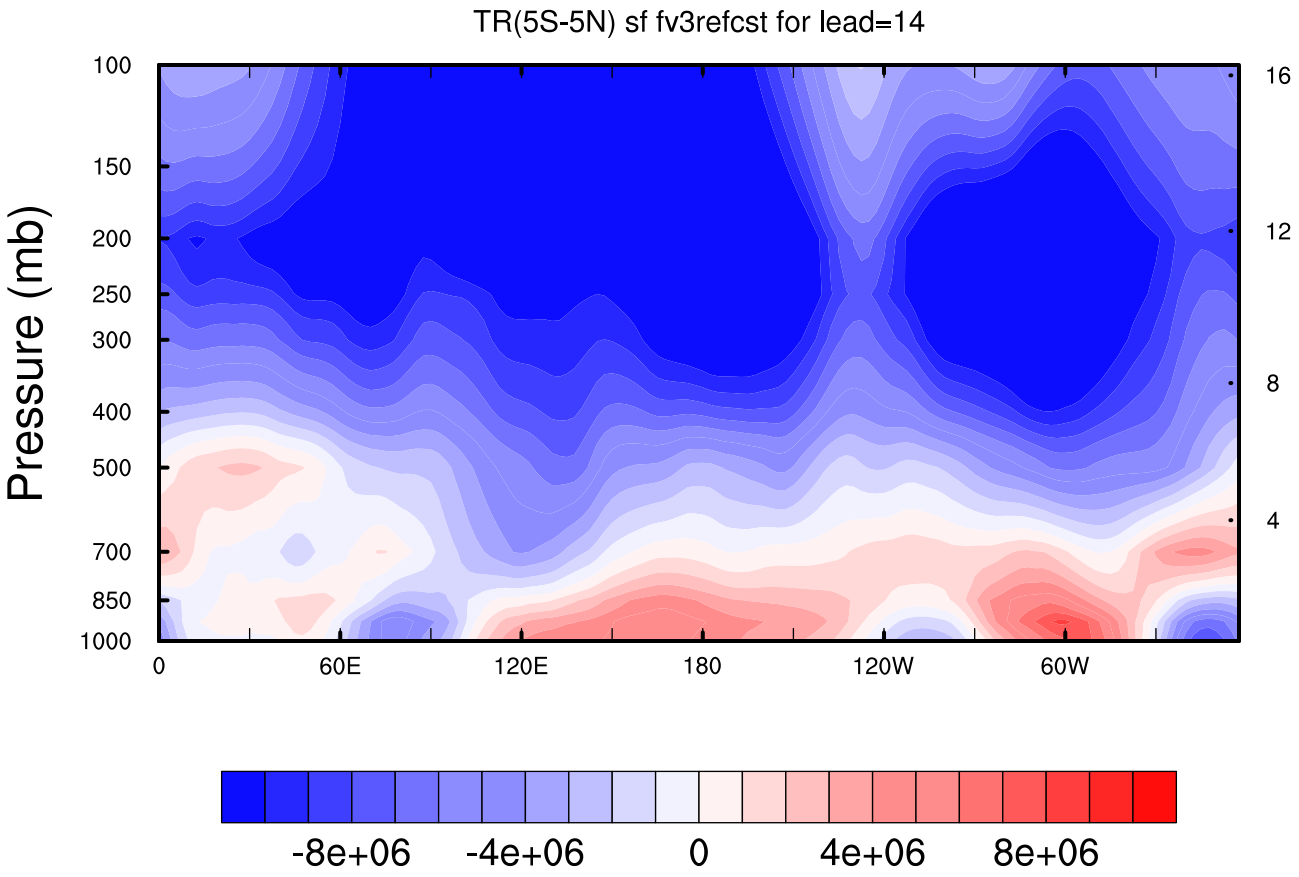

vp 200hPa fv3refcst for lead=14
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

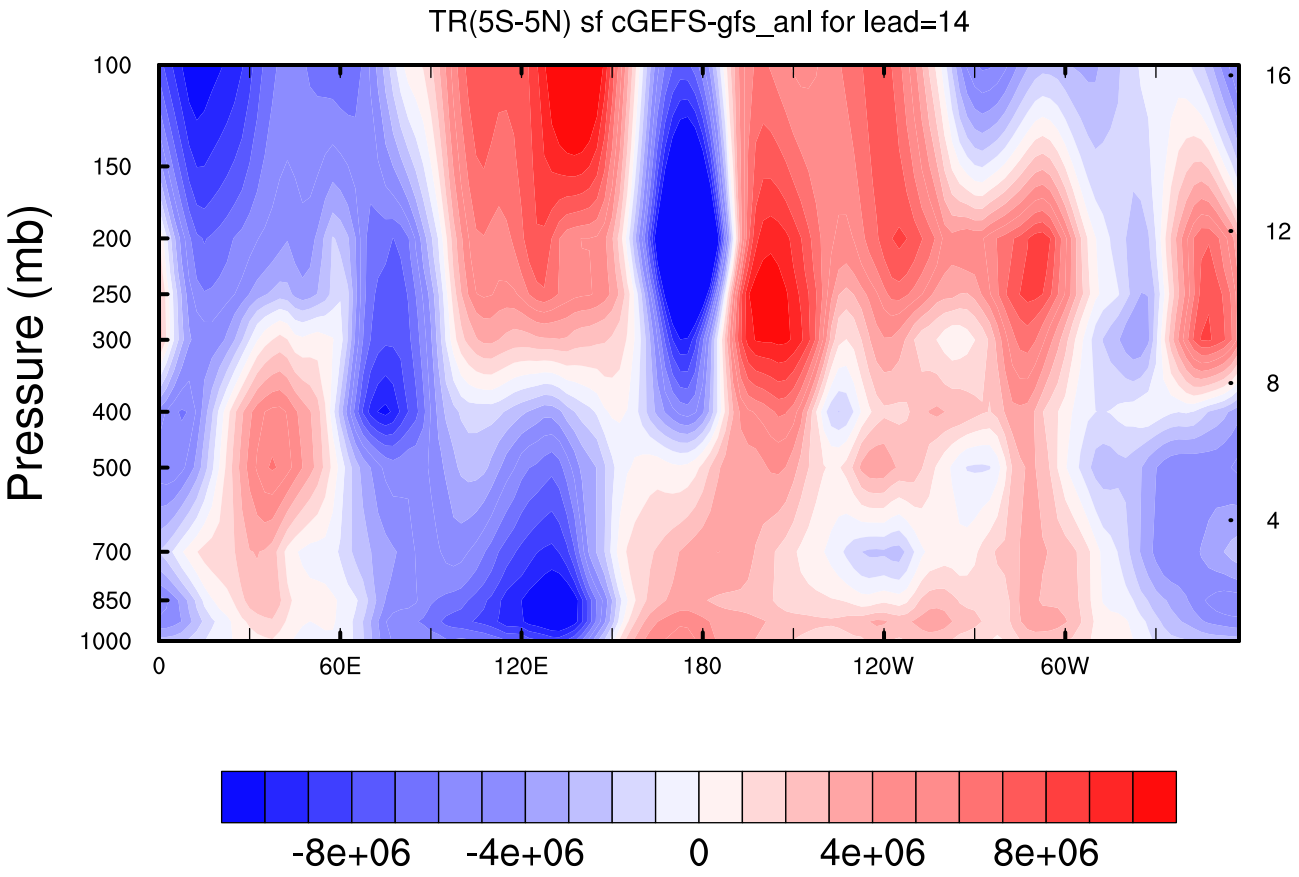

vp 200hPa cGEFS-gfs_anl for lead=14
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

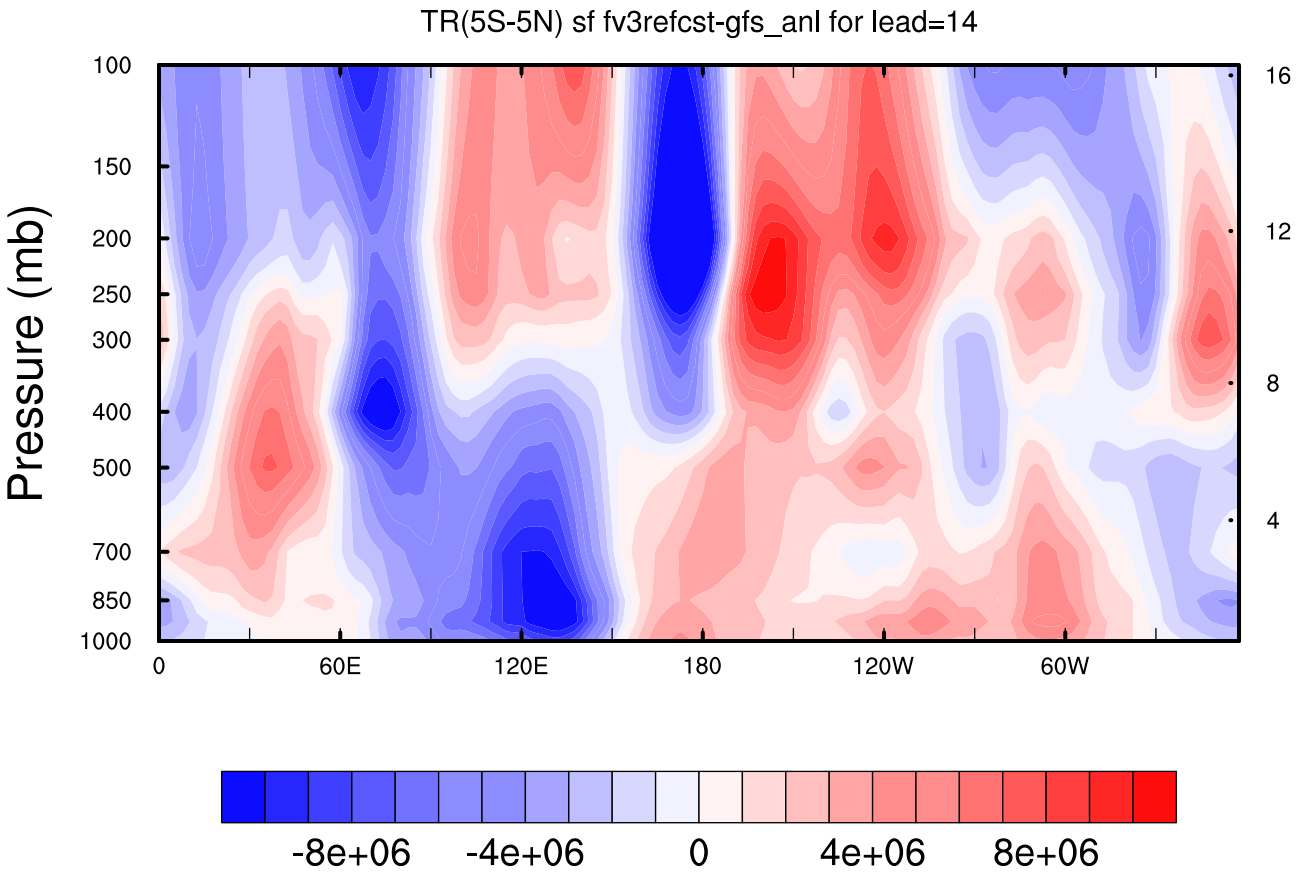

vp 200hPa fv3refcst-gfs_anl for lead=14
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

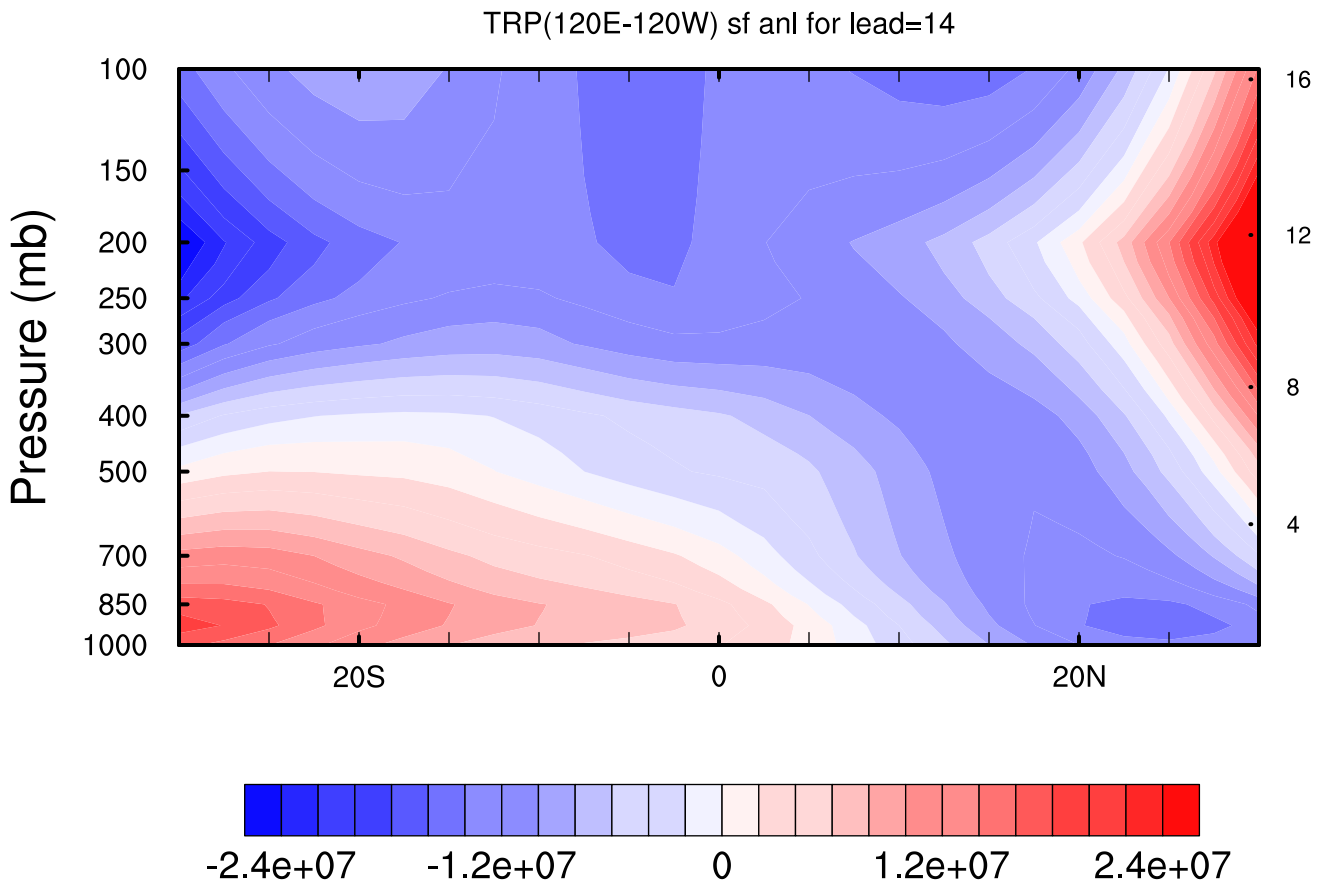

TR(5S-5N) sf anl for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

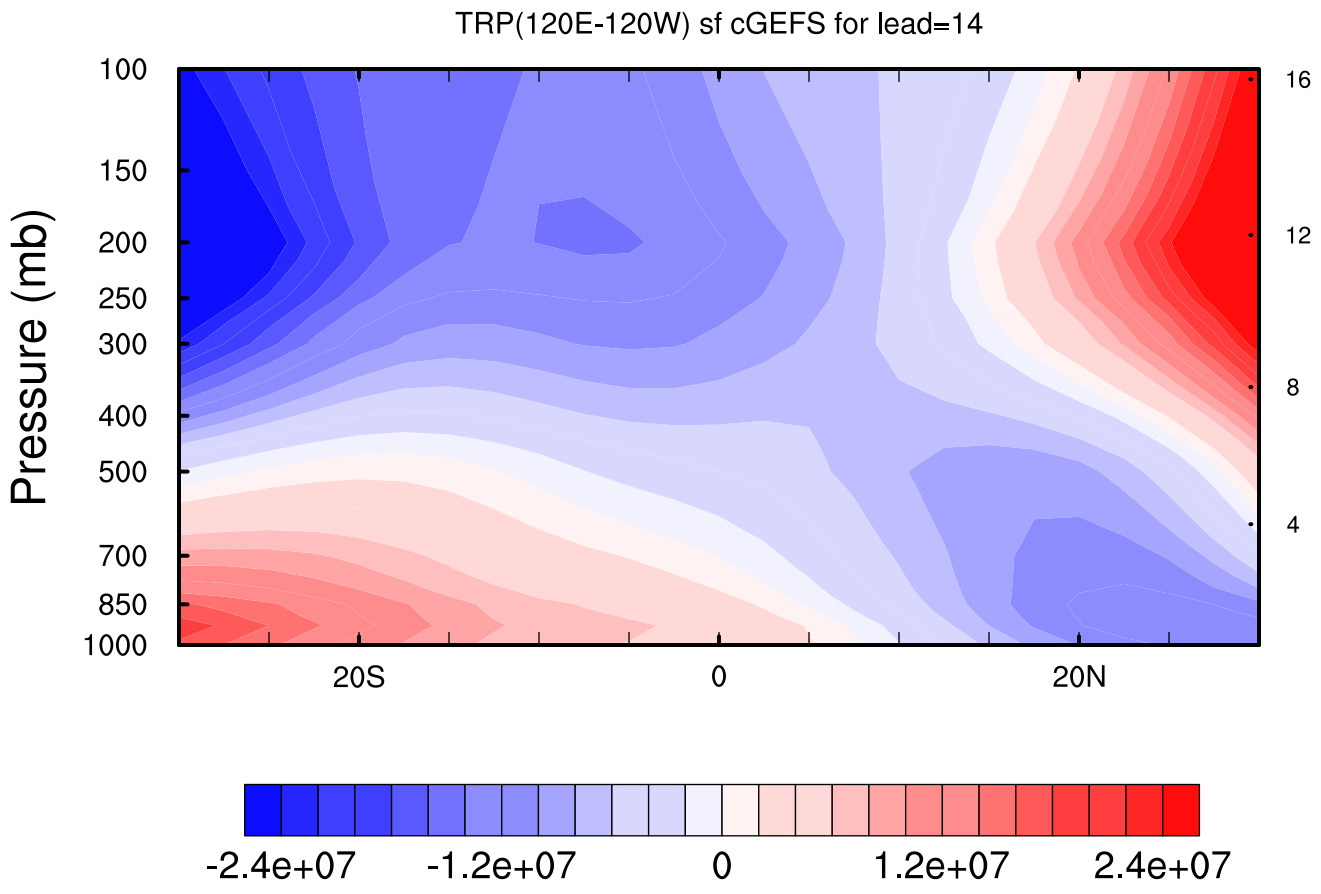

TR(5S-5N) sf cGEFS for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

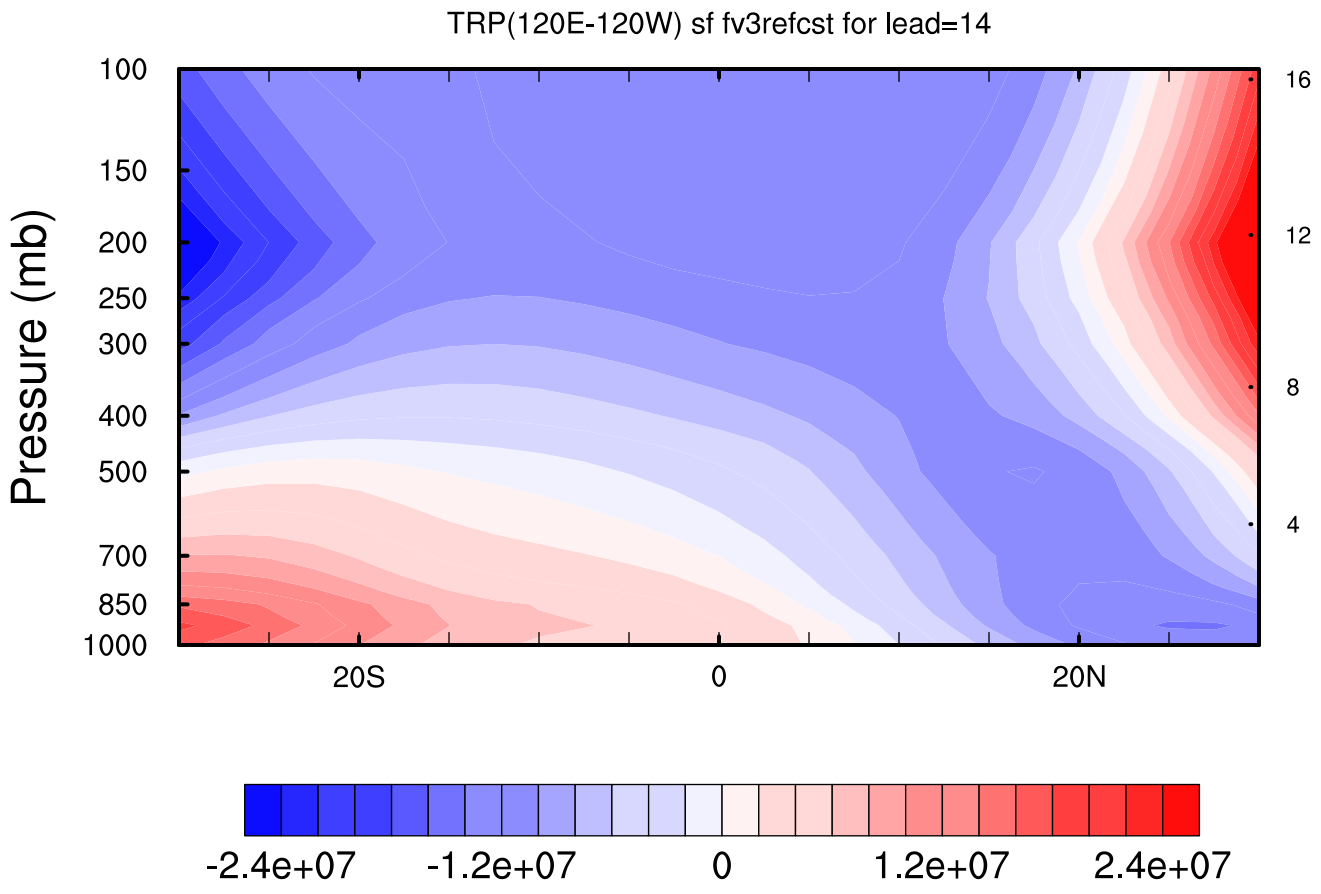

TR(5S-5N) sf fv3refcst for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

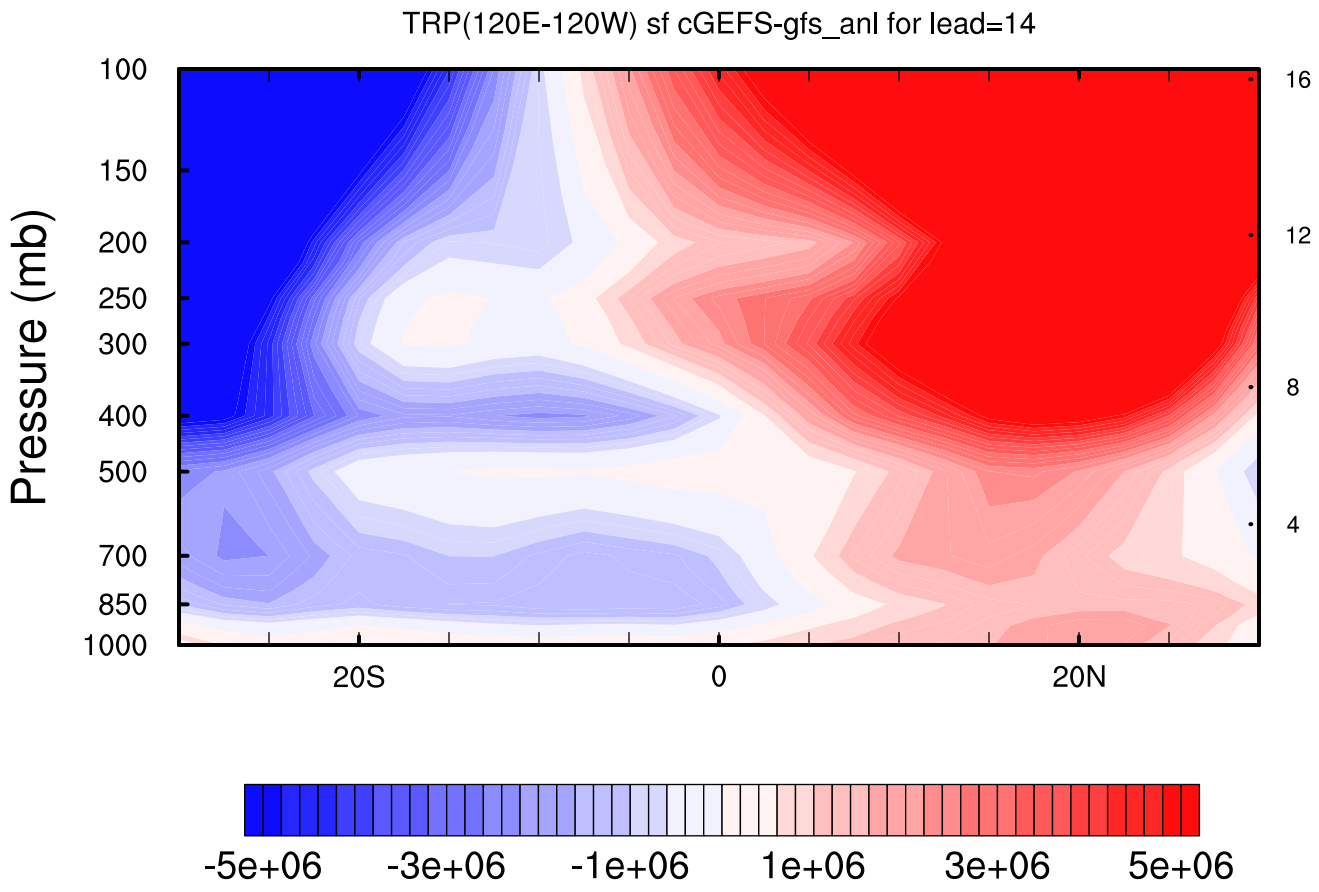

TR(5S-5N) sf cGEFS-gfs_anl for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

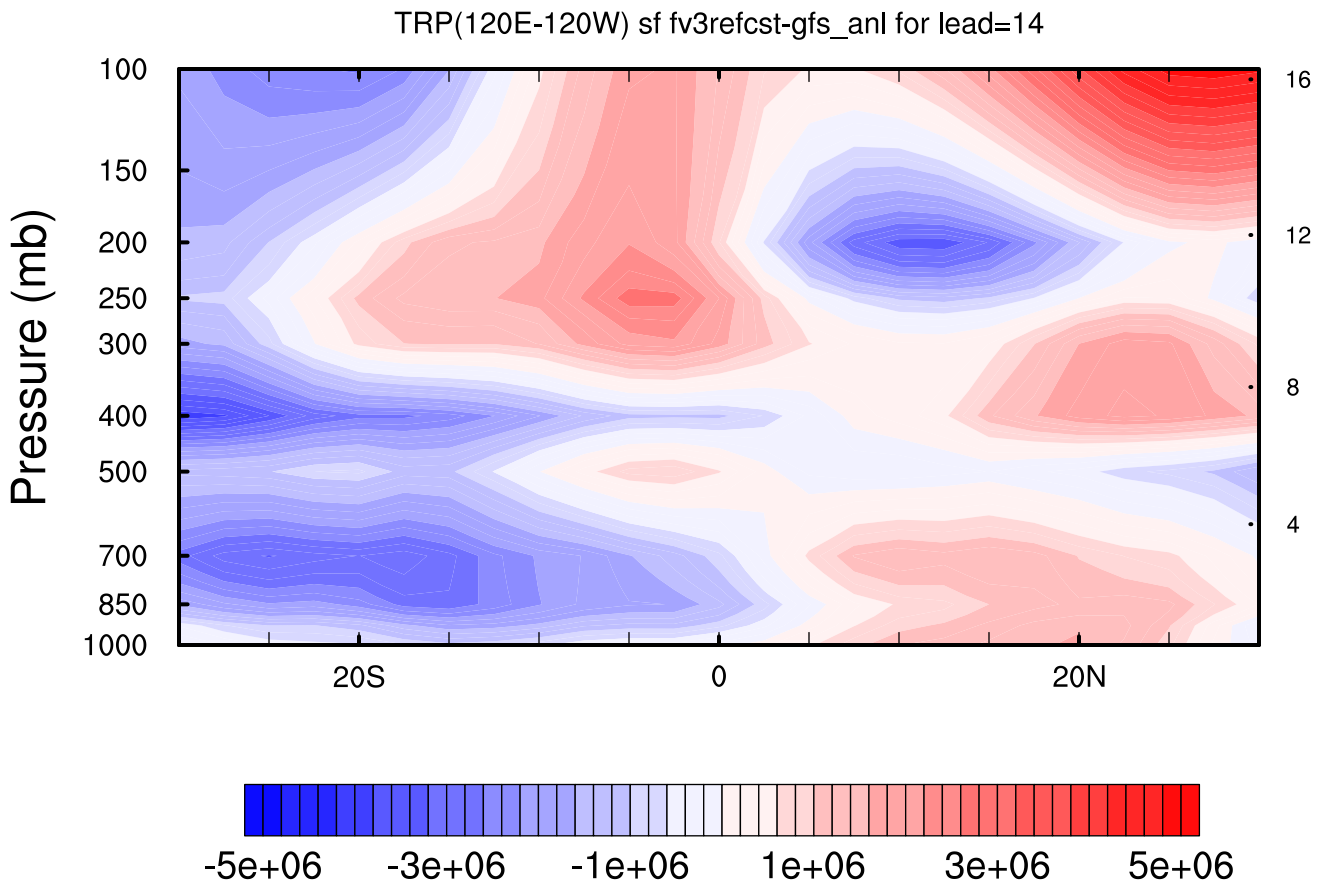

TR(5S-5N) sf fv3refcst-gfs_anl for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

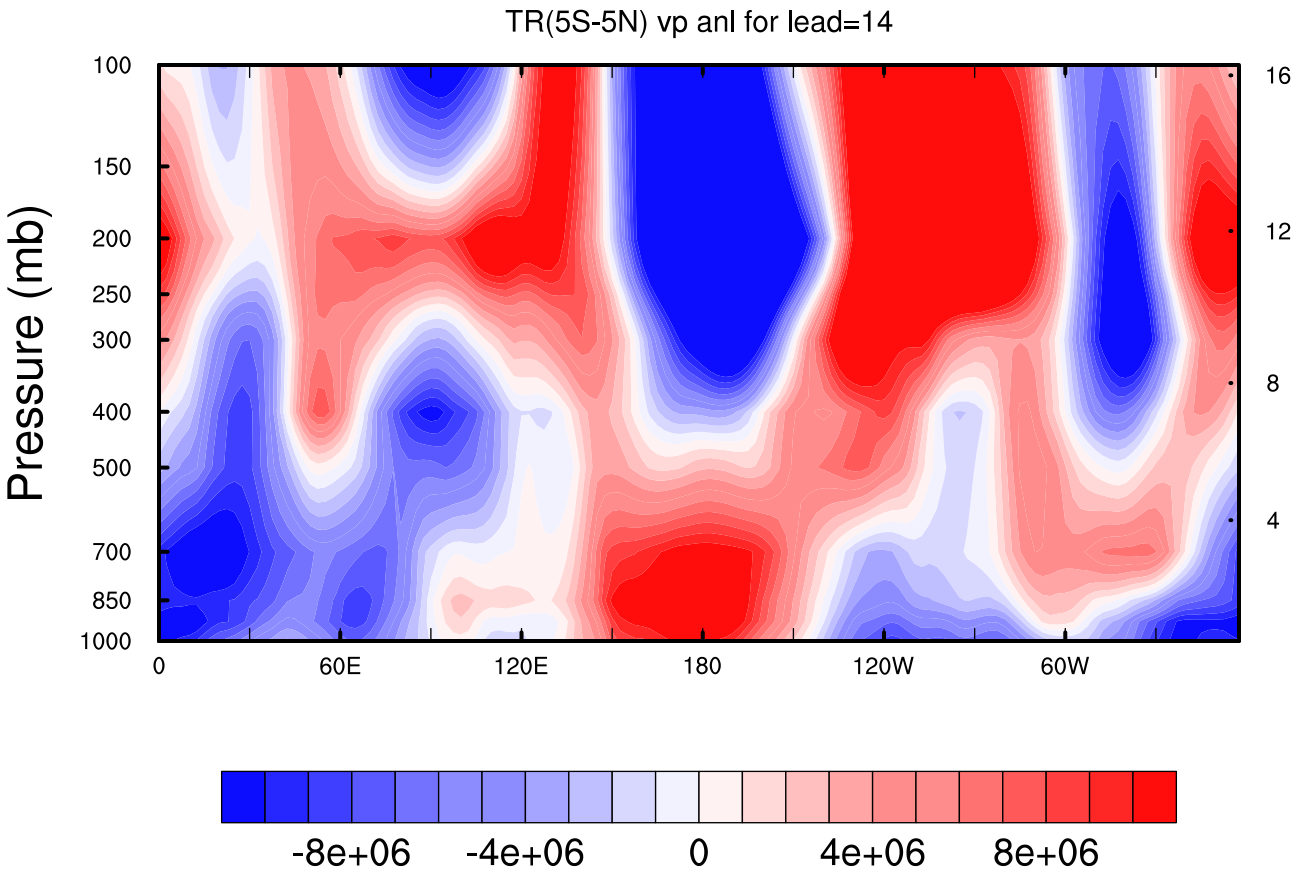

TRP(120E-120W) sf anl for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

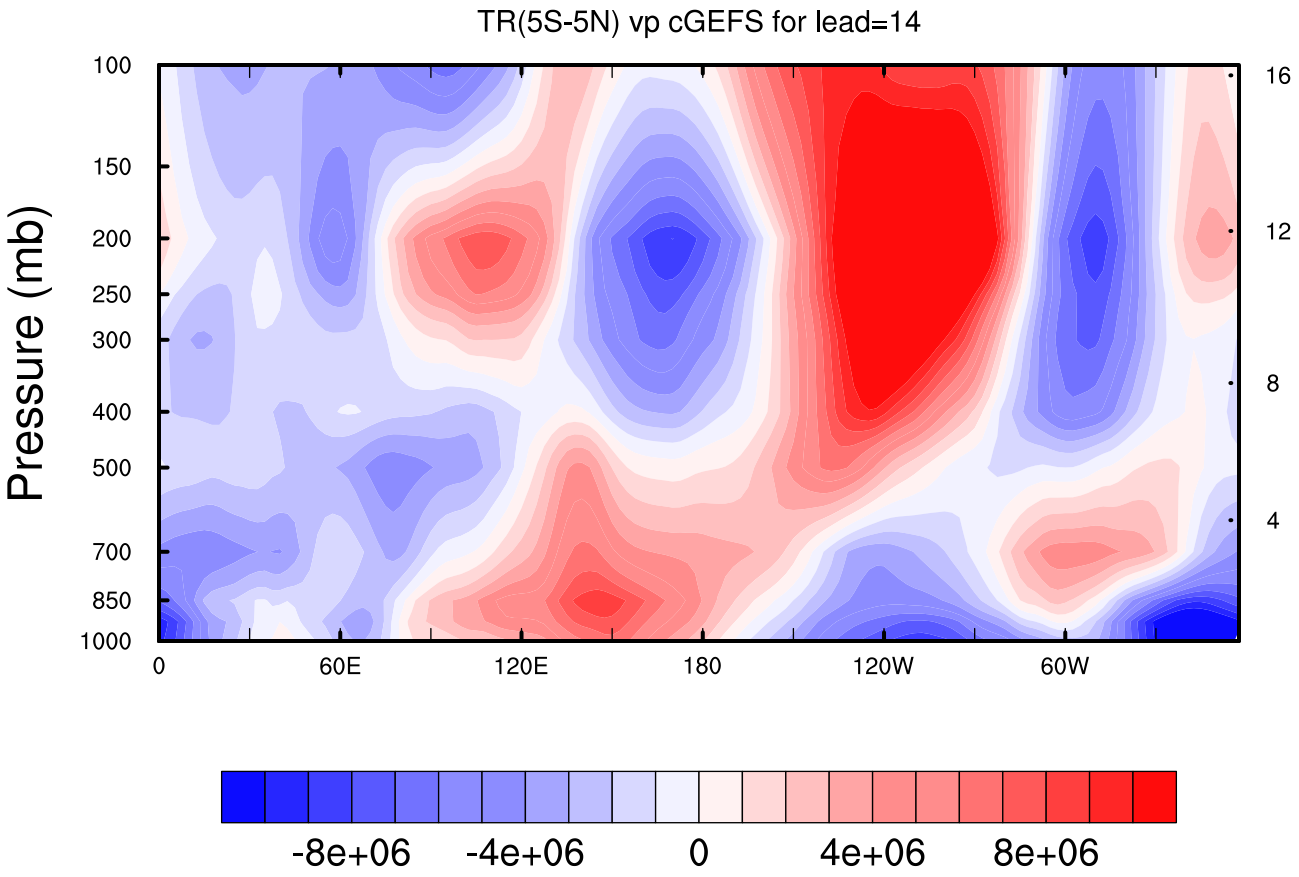

TRP(120E-120W) sf cGEFS for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

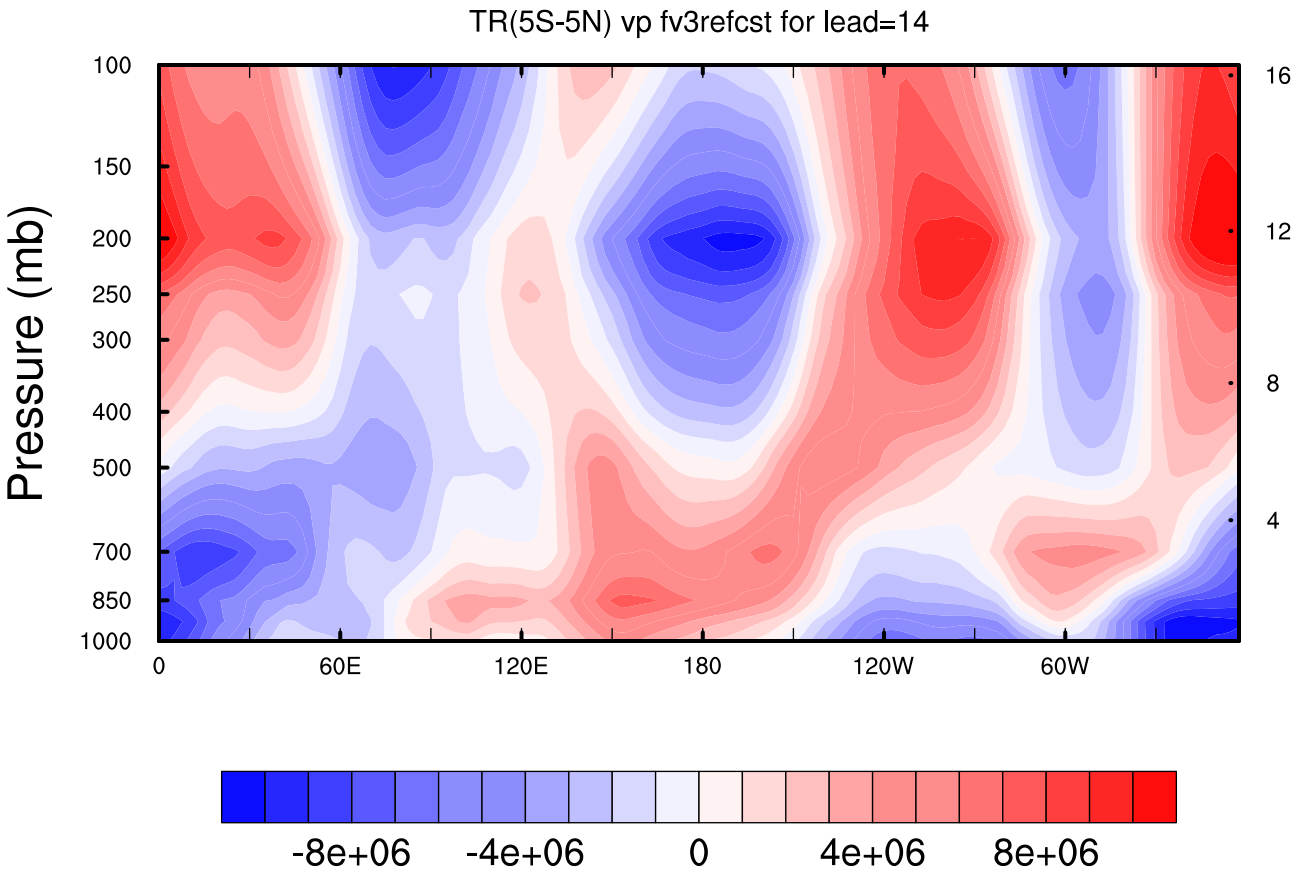

TRP(120E-120W) sf fv3refcst for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

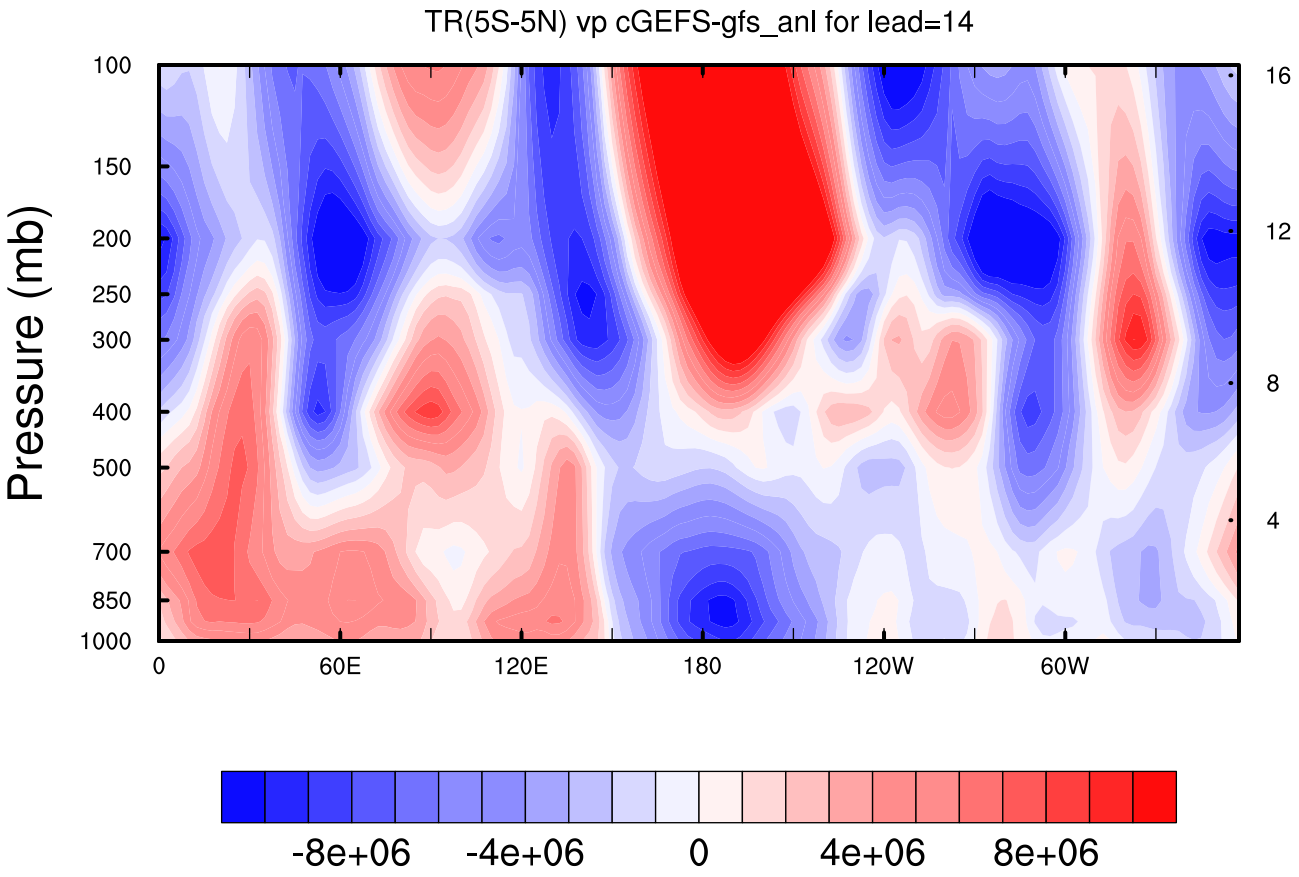

TRP(120E-120W) sf cGEFS-gfs_anl for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

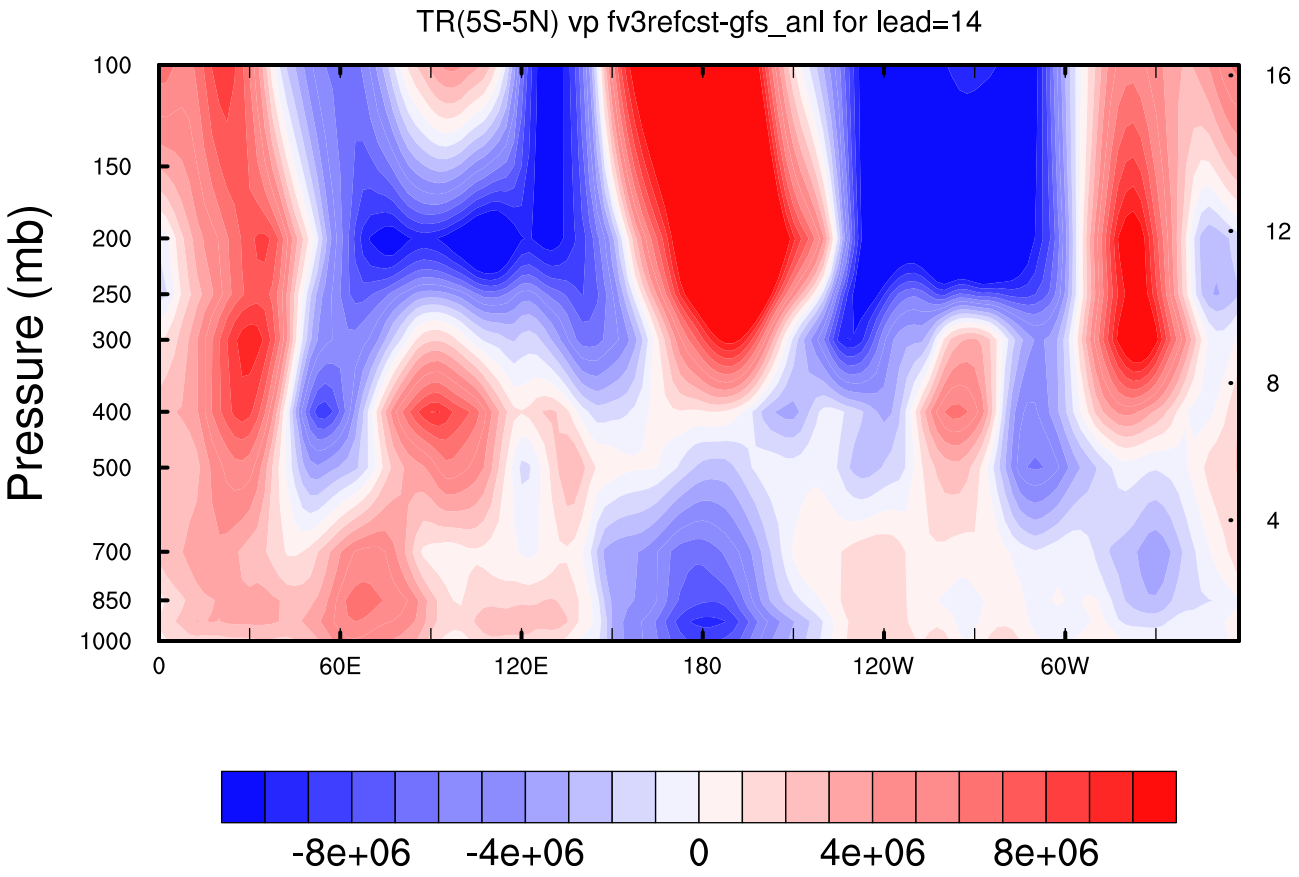

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

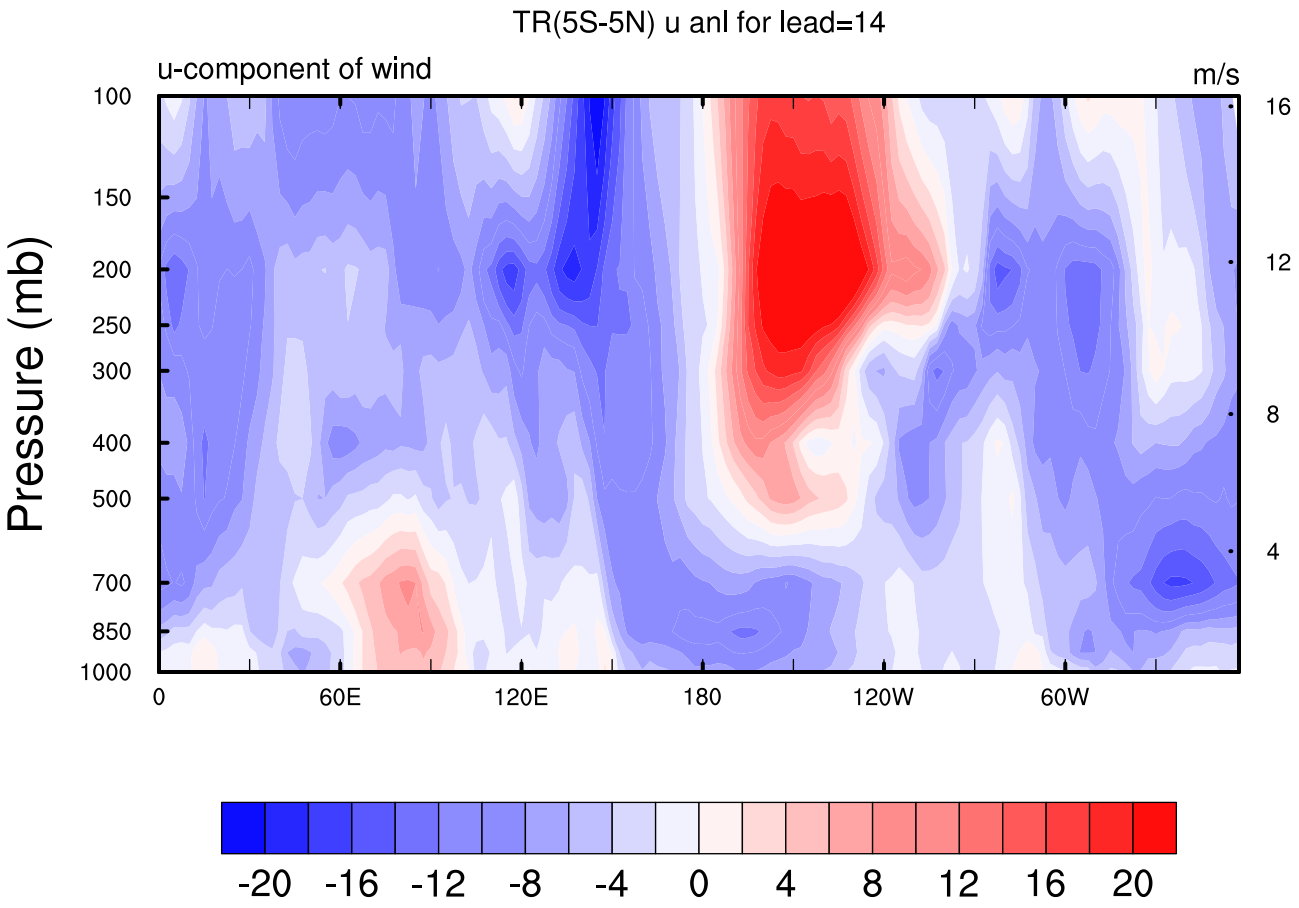

TR(5S-5N) vp anl for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

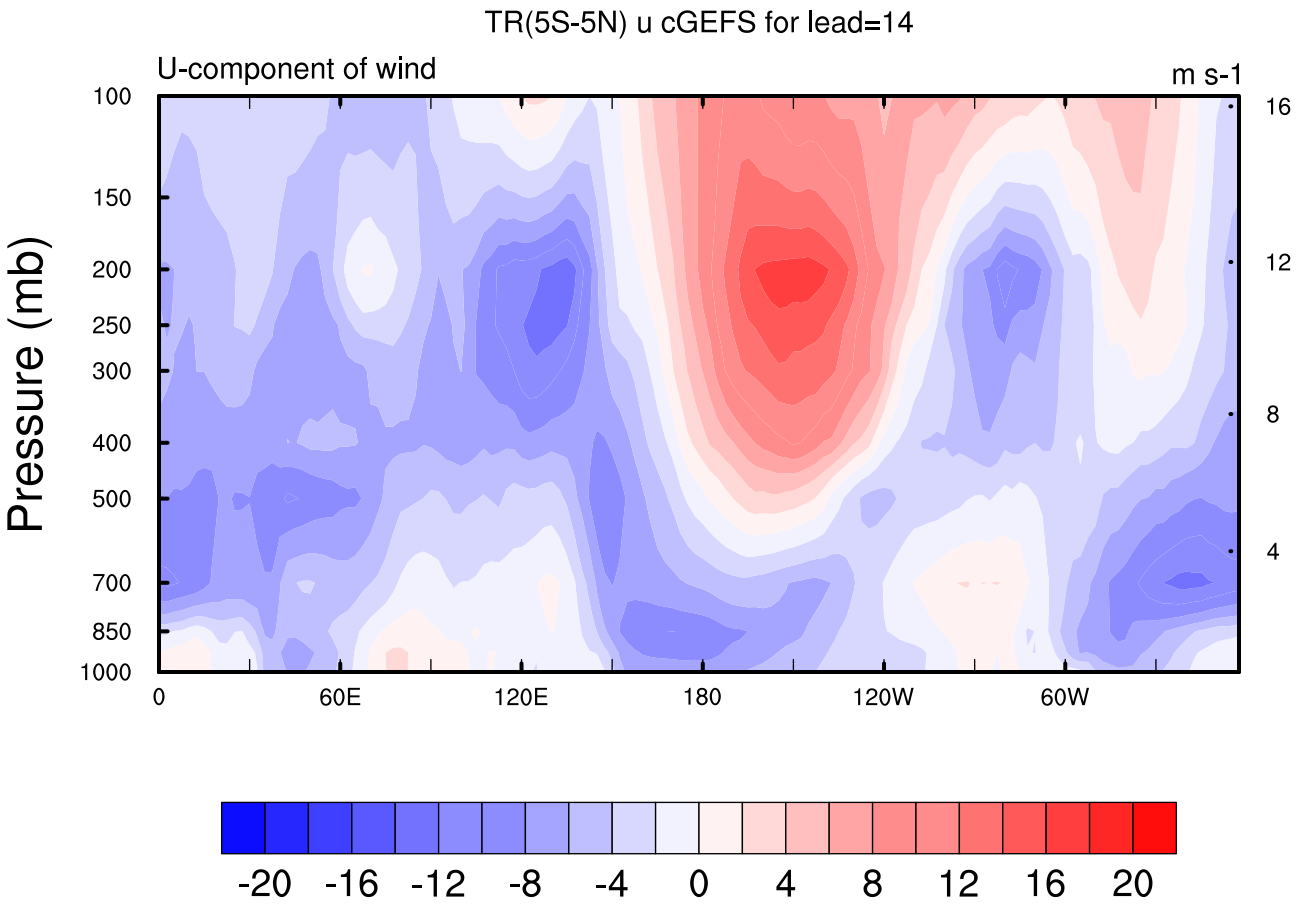

TR(5S-5N) vp cGEFS for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

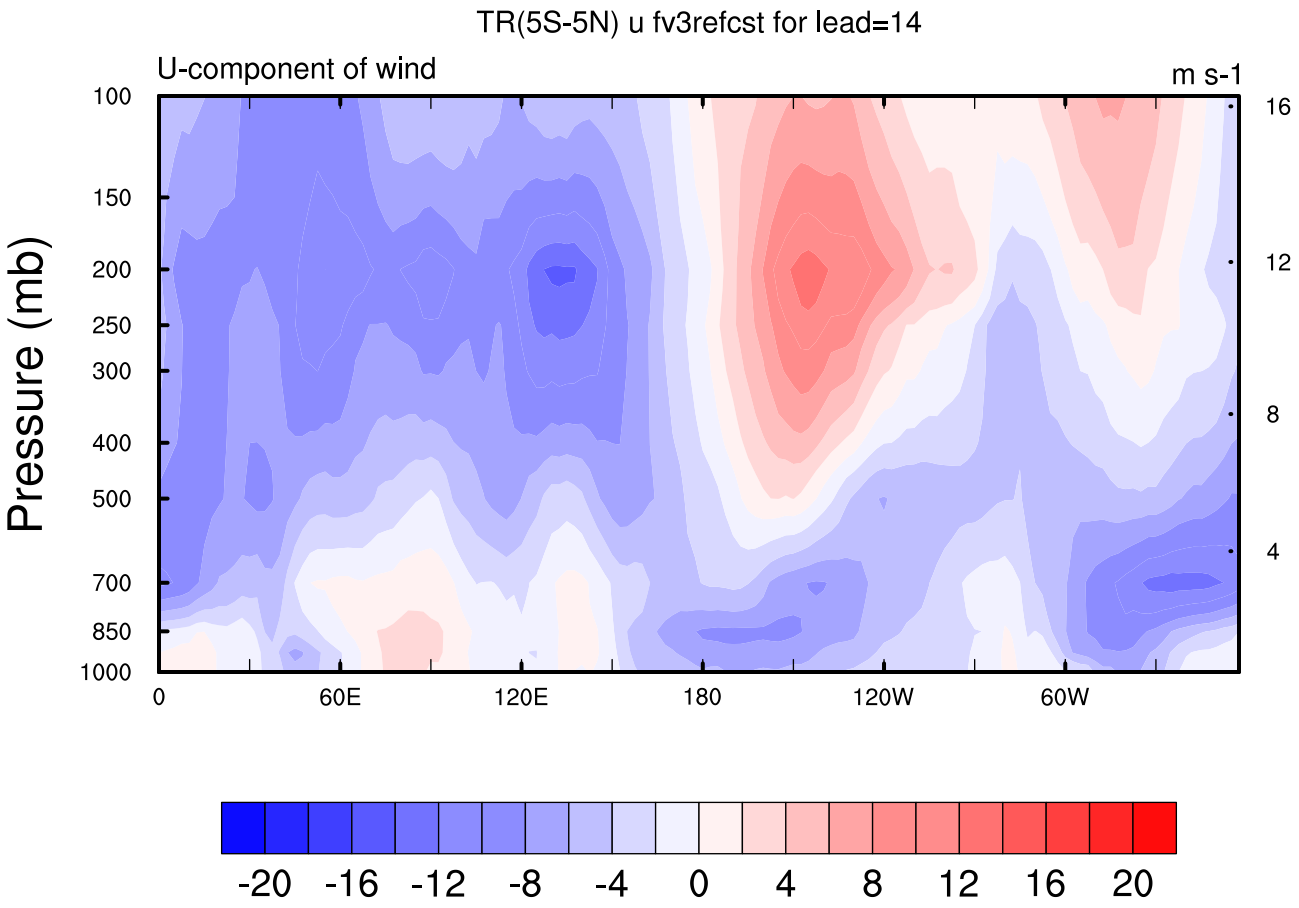

TR(5S-5N) vp fv3refcst for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

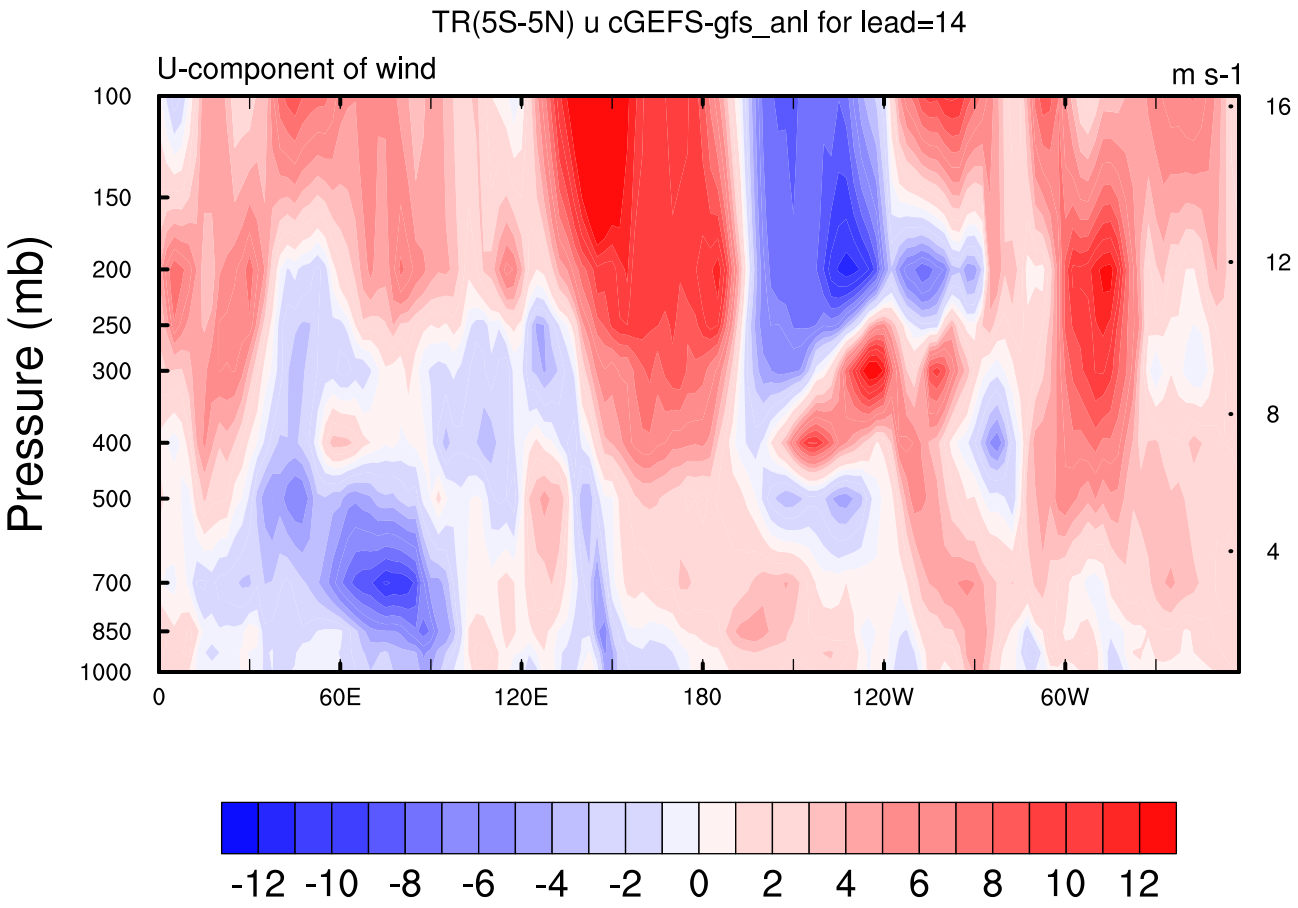

TR(5S-5N) vp cGEFS-gfs_anl for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

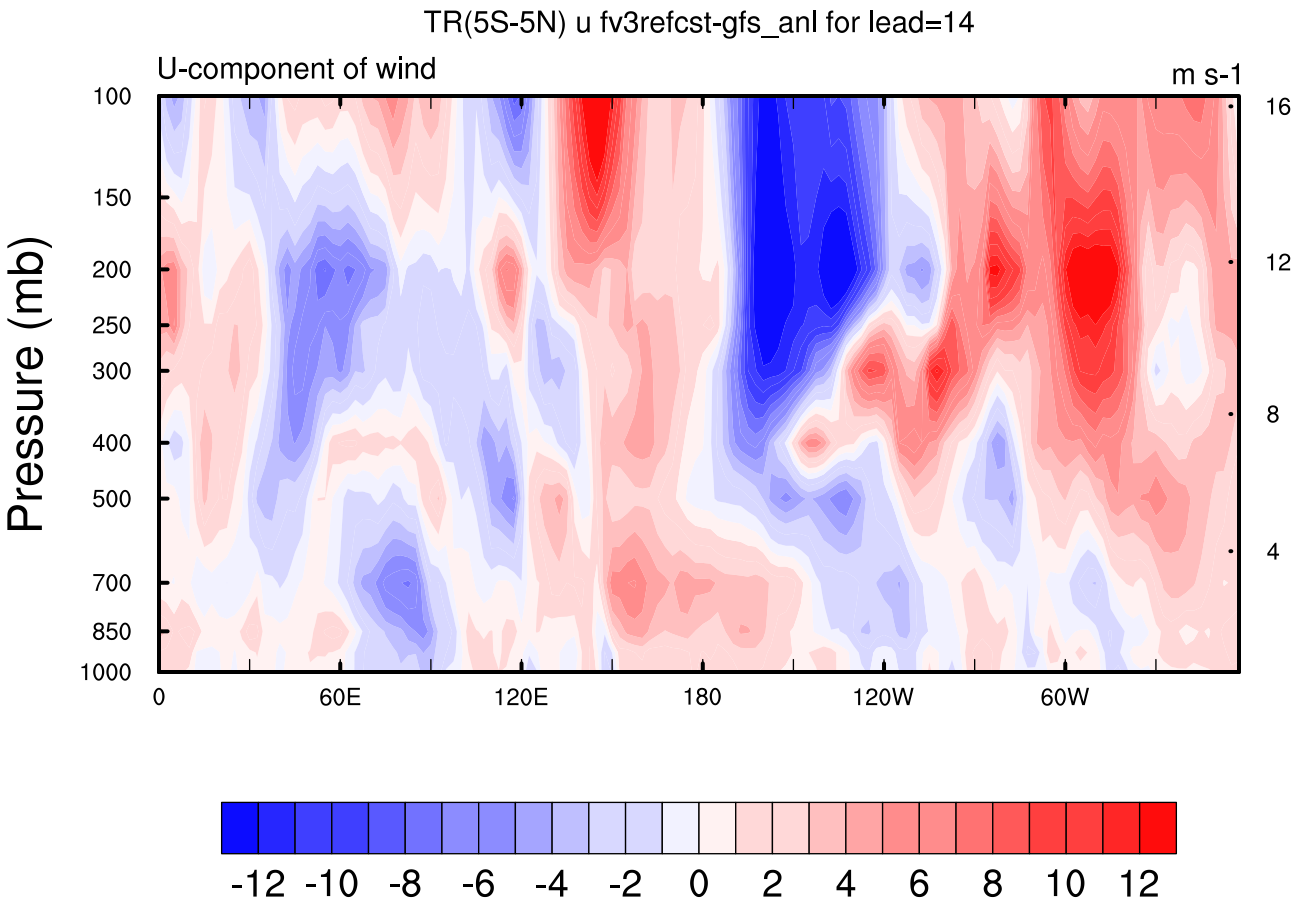

TR(5S-5N) vp fv3refcst-gfs_anl for lead=14
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

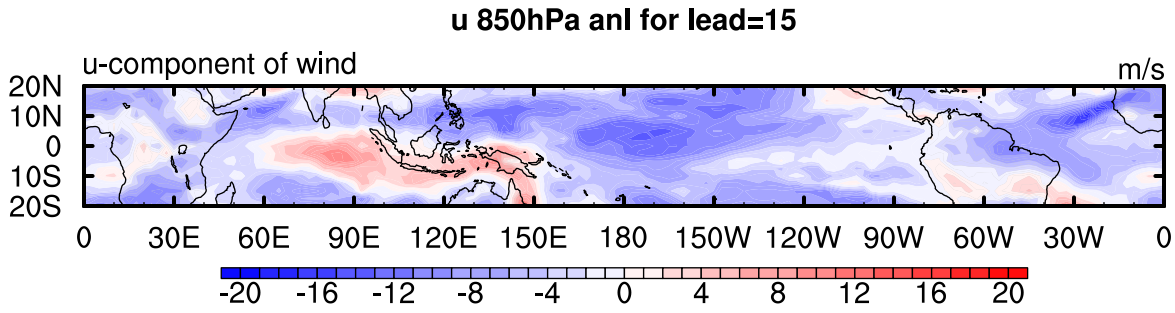

TR(5S-5N) u anl for lead=14
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

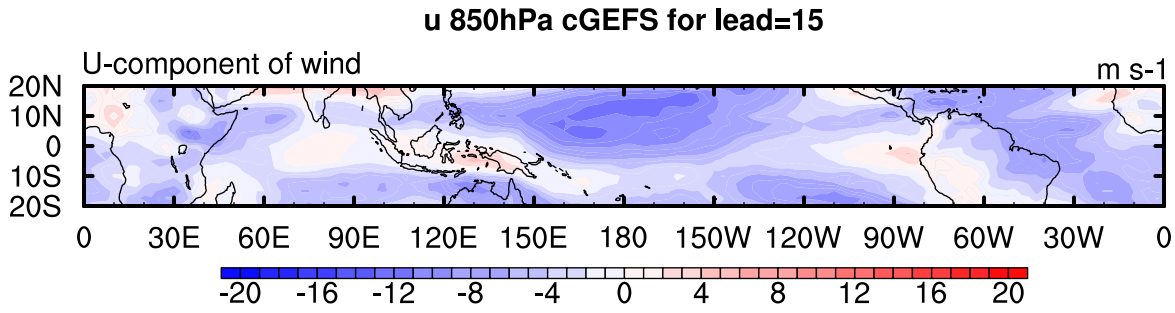

TR(5S-5N) u cGEFS for lead=14
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

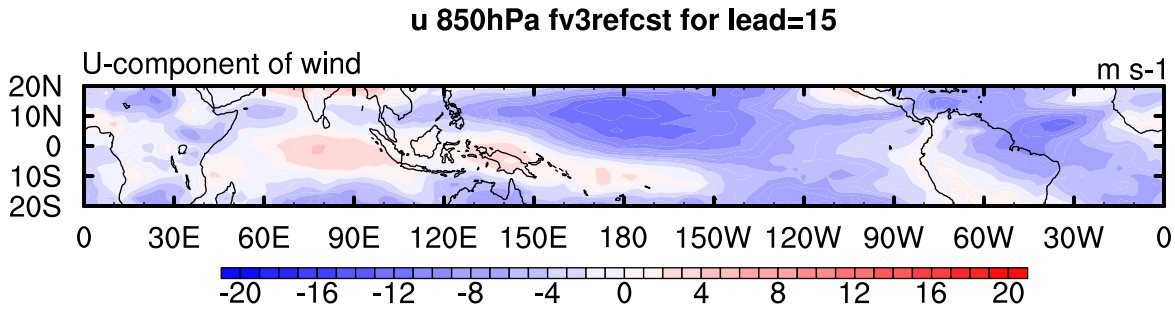

TR(5S-5N) u fv3refcst for lead=14
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

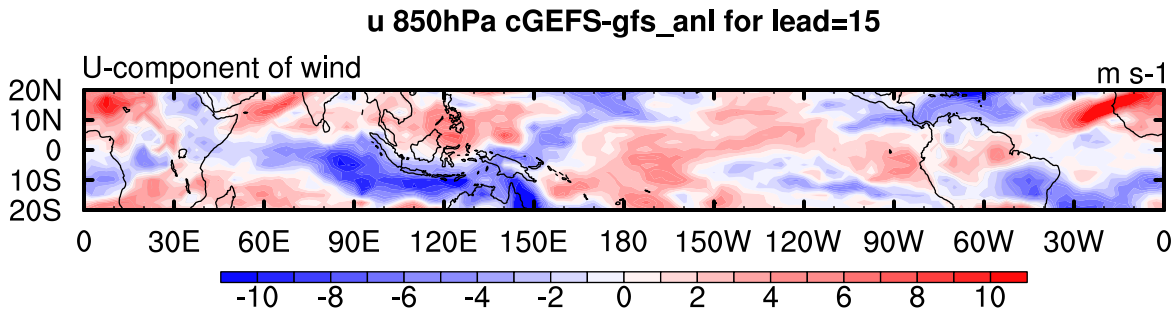

TR(5S-5N) u cGEFS-gfs_anl for lead=14
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

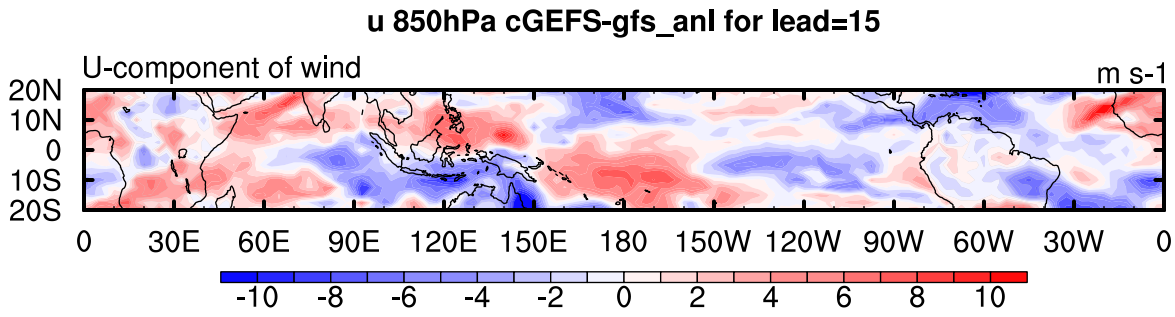

TR(5S-5N) u fv3refcst-gfs_anl for lead=14
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

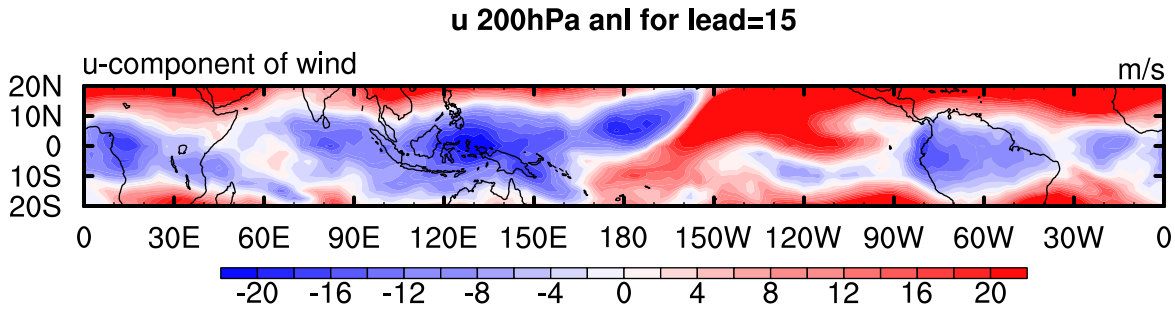

u 850hPa anl for lead=15
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS for lead=15
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa fv3refcst for lead=15
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=15
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 850hPa cGEFS-gfs_anl for lead=15
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=15
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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-16
-12
-8
-4
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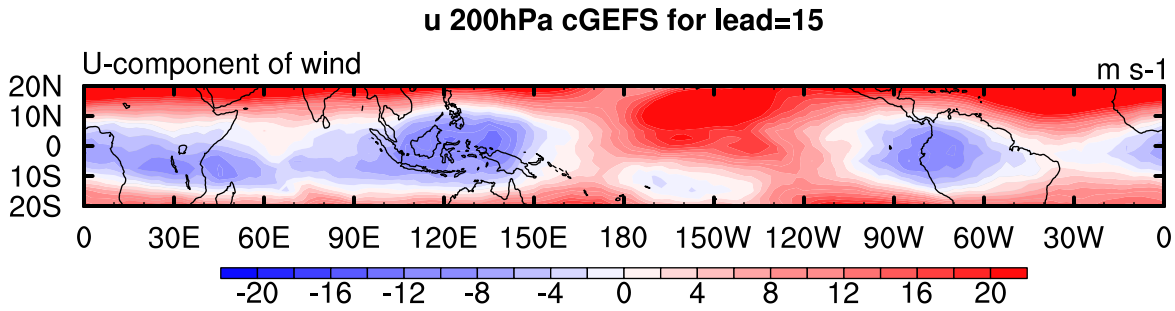
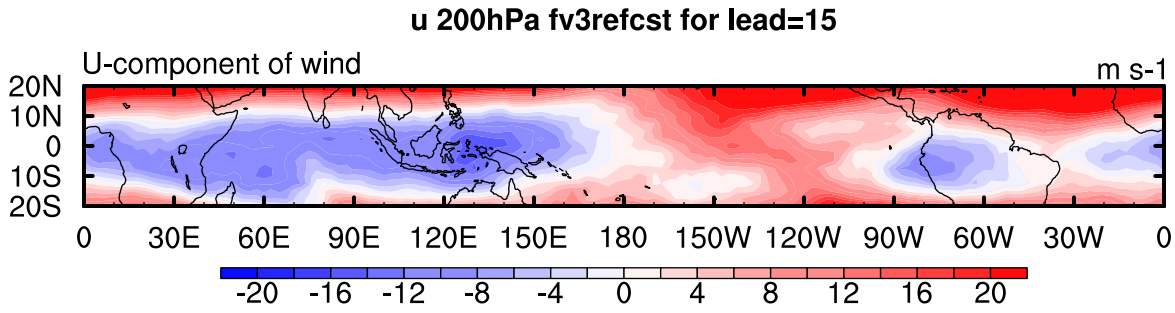
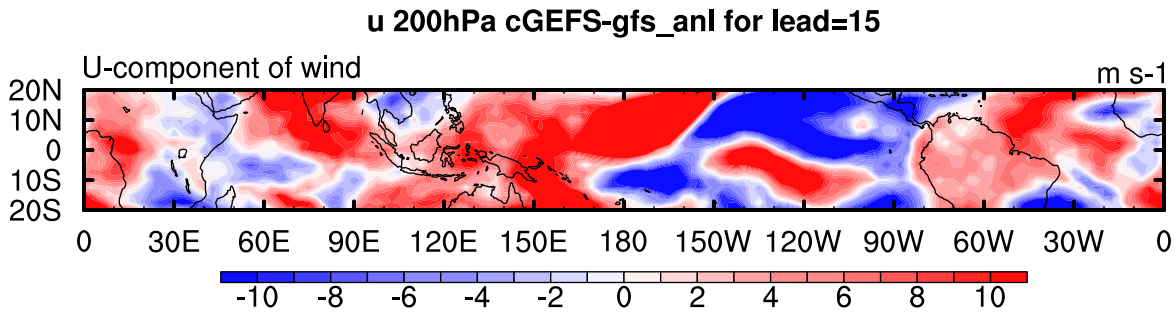
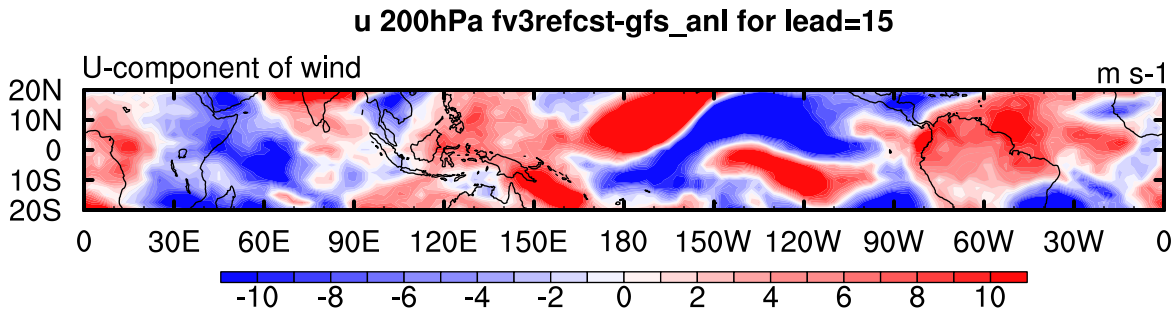
4
8
12
16
20


u 200hPa cGEFS for lead=15
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=15
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=15
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=15
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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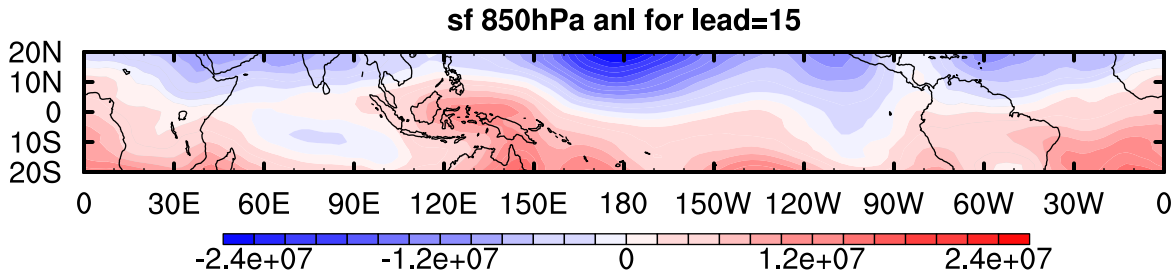
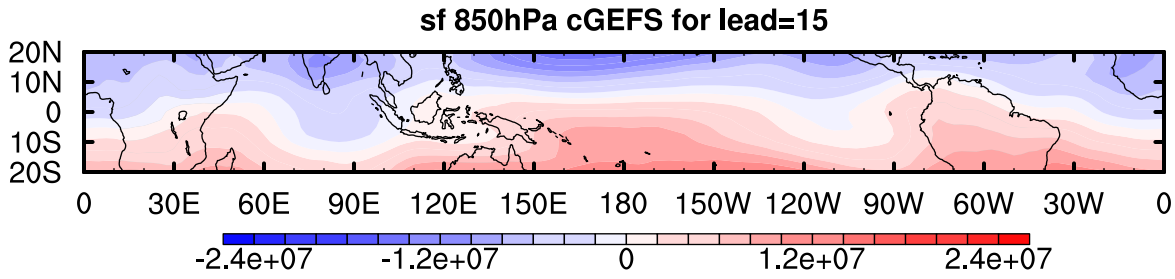
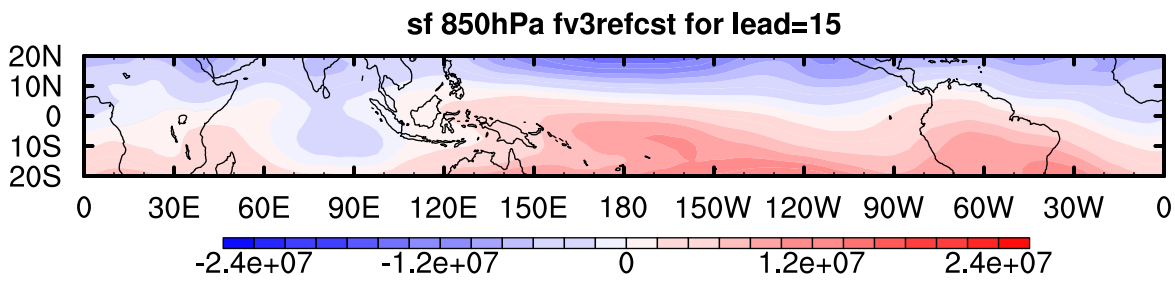
-10
-8
-6
-4
-2
0
2
4
6
8
10


sf 850hPa anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
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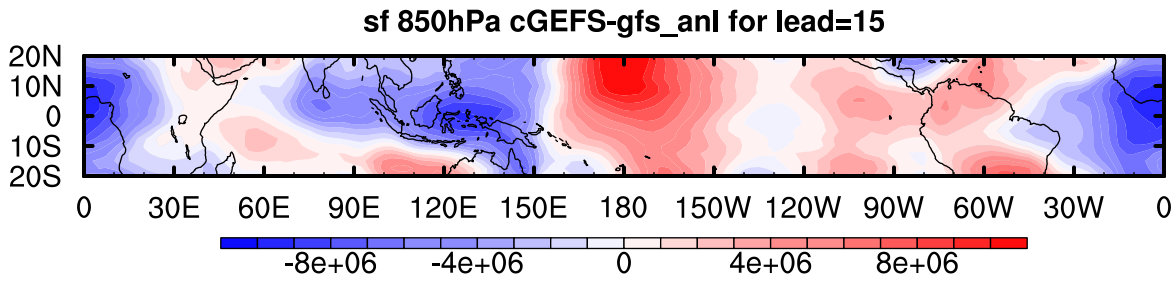
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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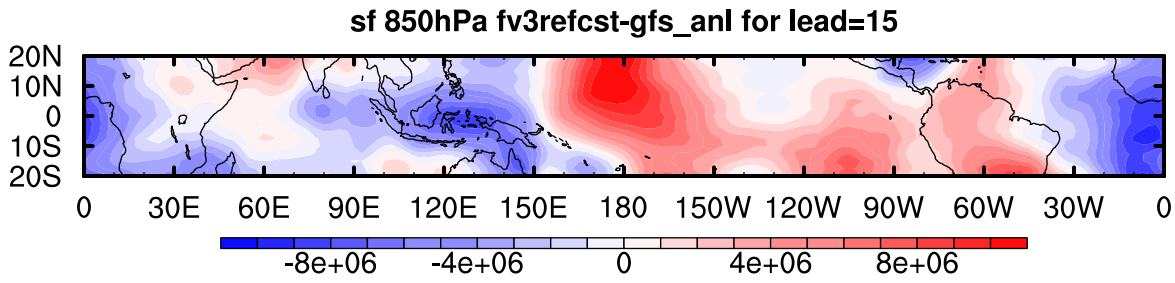
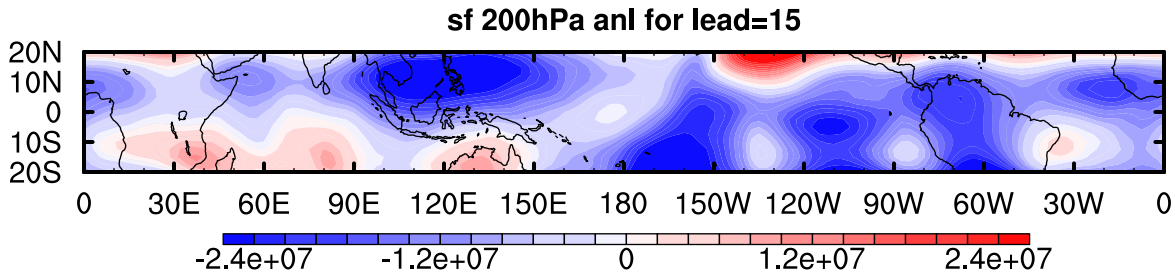
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
0
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-1.2e+07
0
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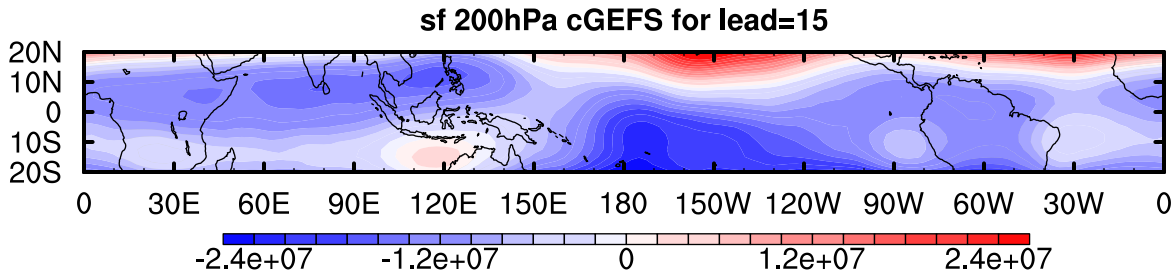
2.4e+07


sf 200hPa cGEFS for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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60W
30W
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0
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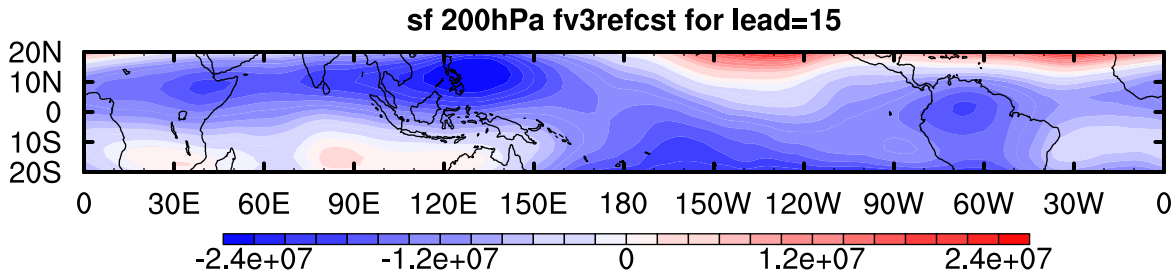
2.4e+07


sf 200hPa fv3refcst for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
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60W
30W
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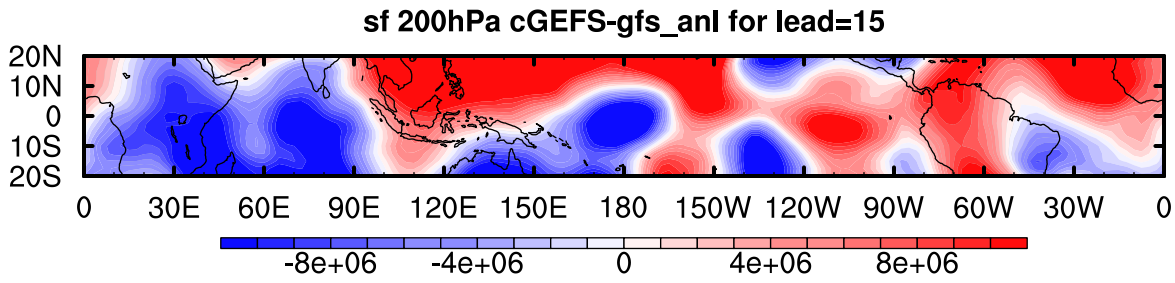
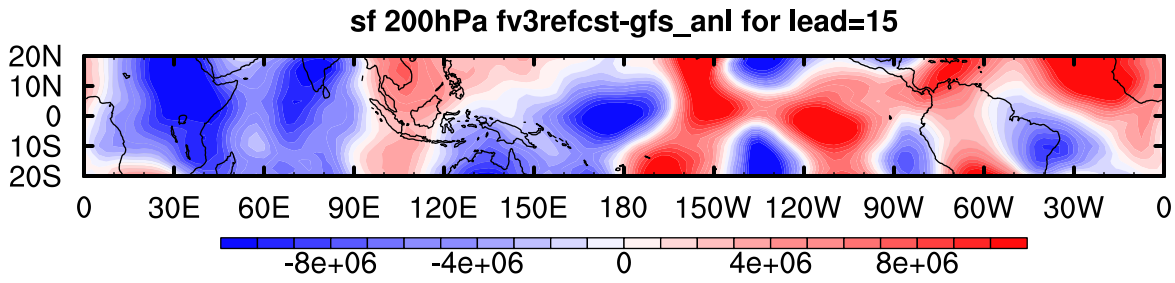
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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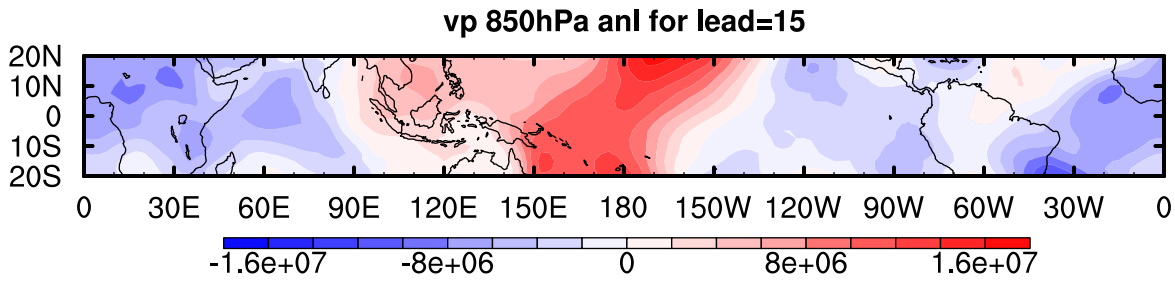
-4e+06
0
4e+06
8e+06


vp 850hPa anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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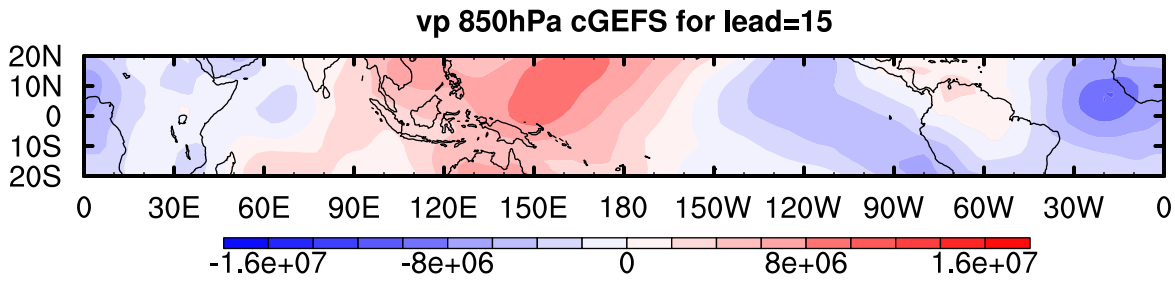
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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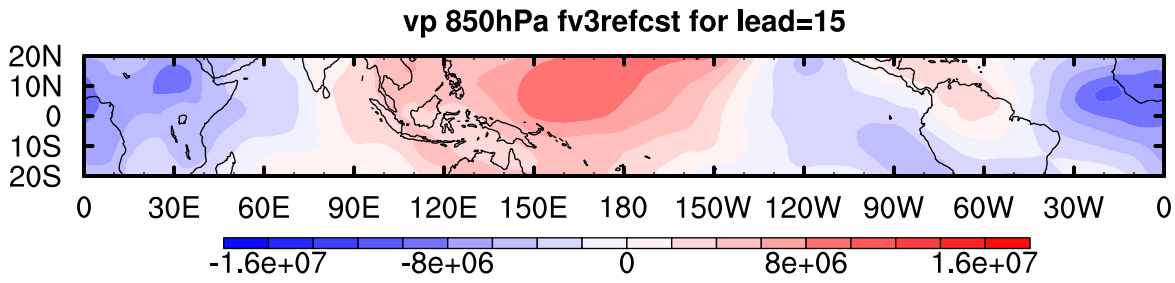
1.6e+07


vp 850hPa fv3refcst for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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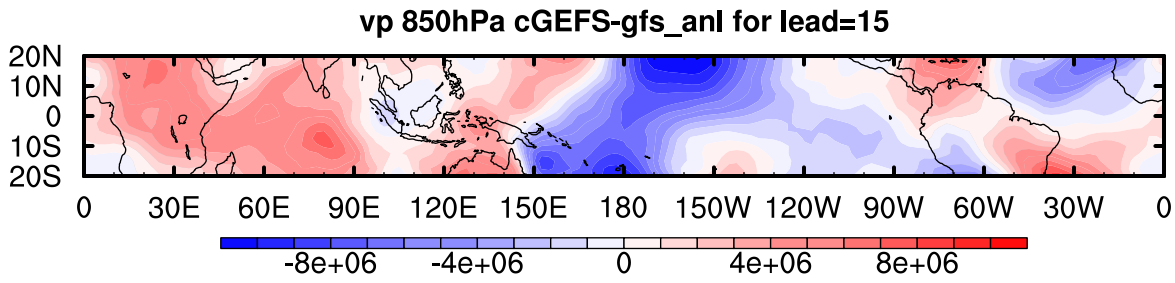
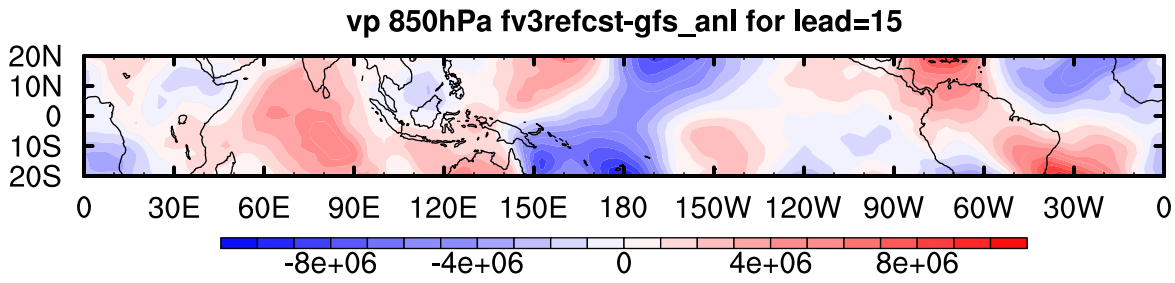
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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-4e+06
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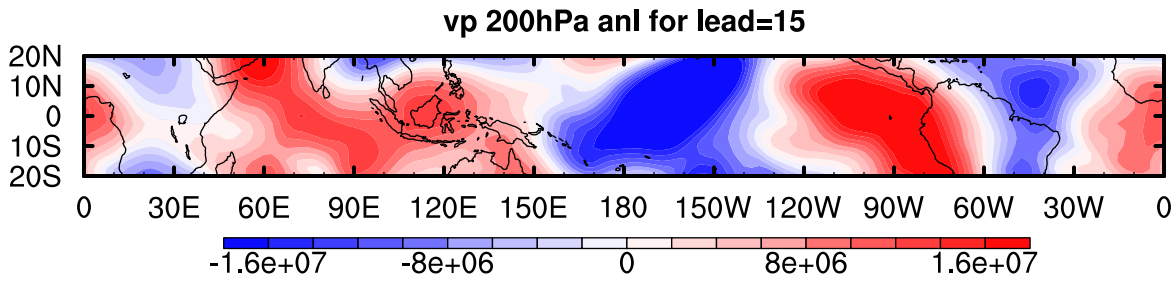
8e+06


vp 200hPa anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
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-1.6e+07
-8e+06
0
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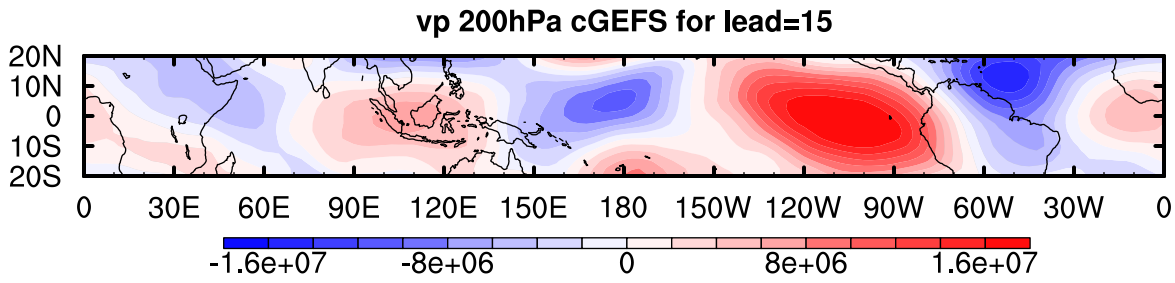
1.6e+07


vp 200hPa cGEFS for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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150W
120W
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60W
30W
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-8e+06
0
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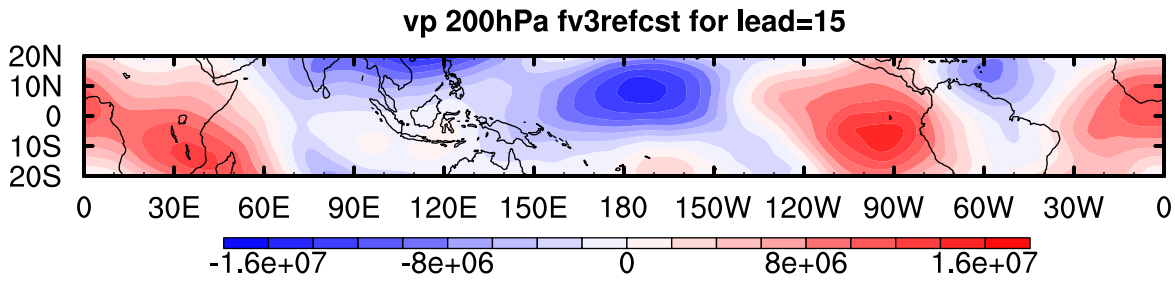
1.6e+07


vp 200hPa fv3refcst for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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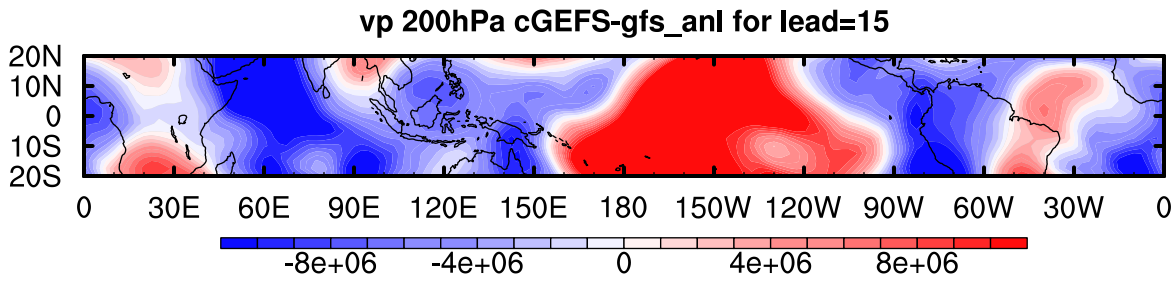
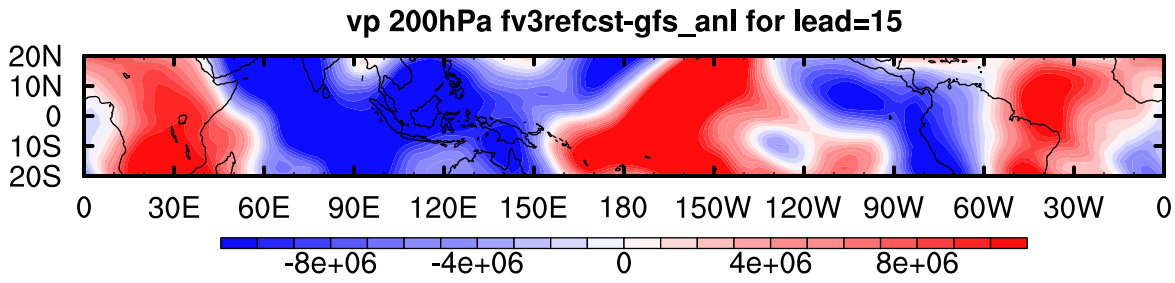
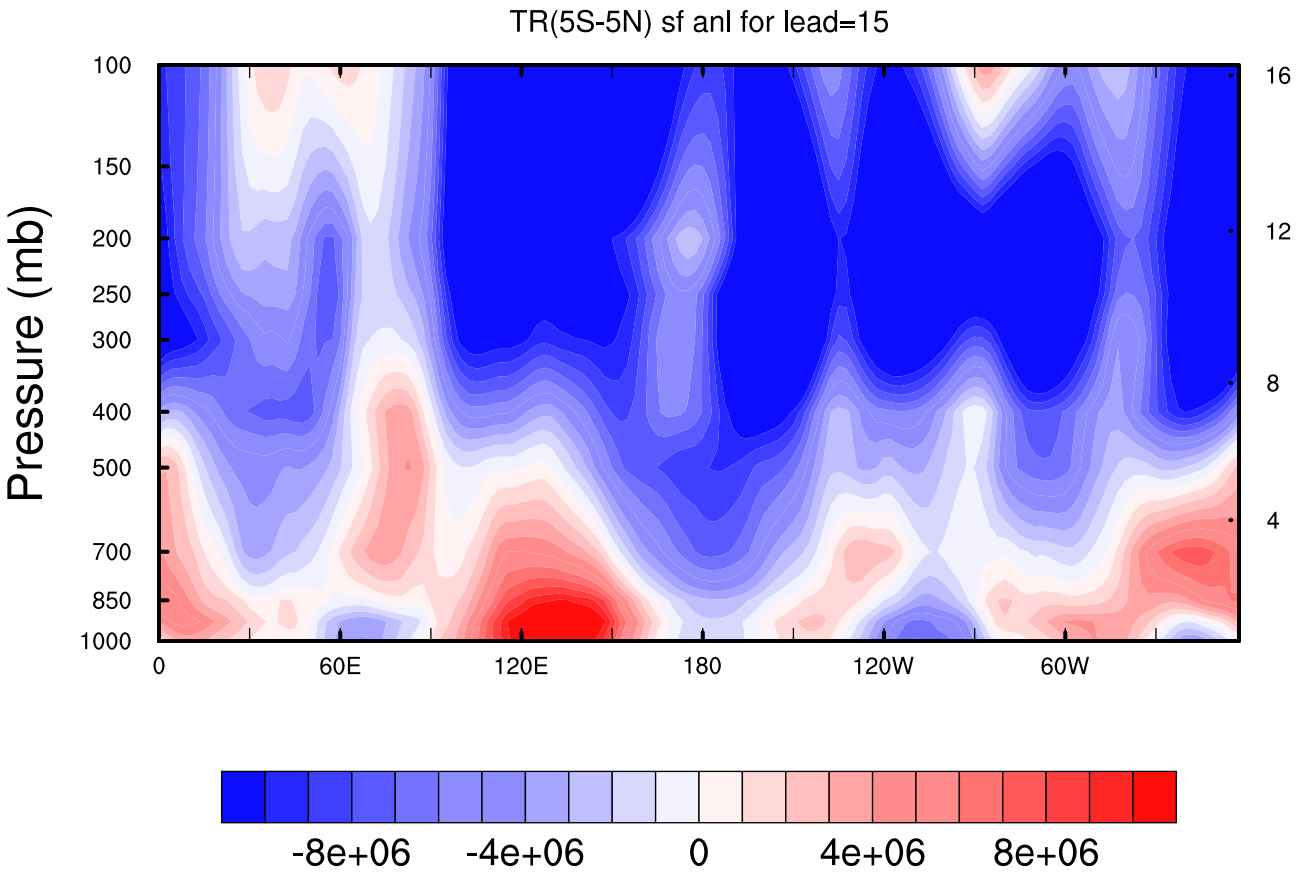
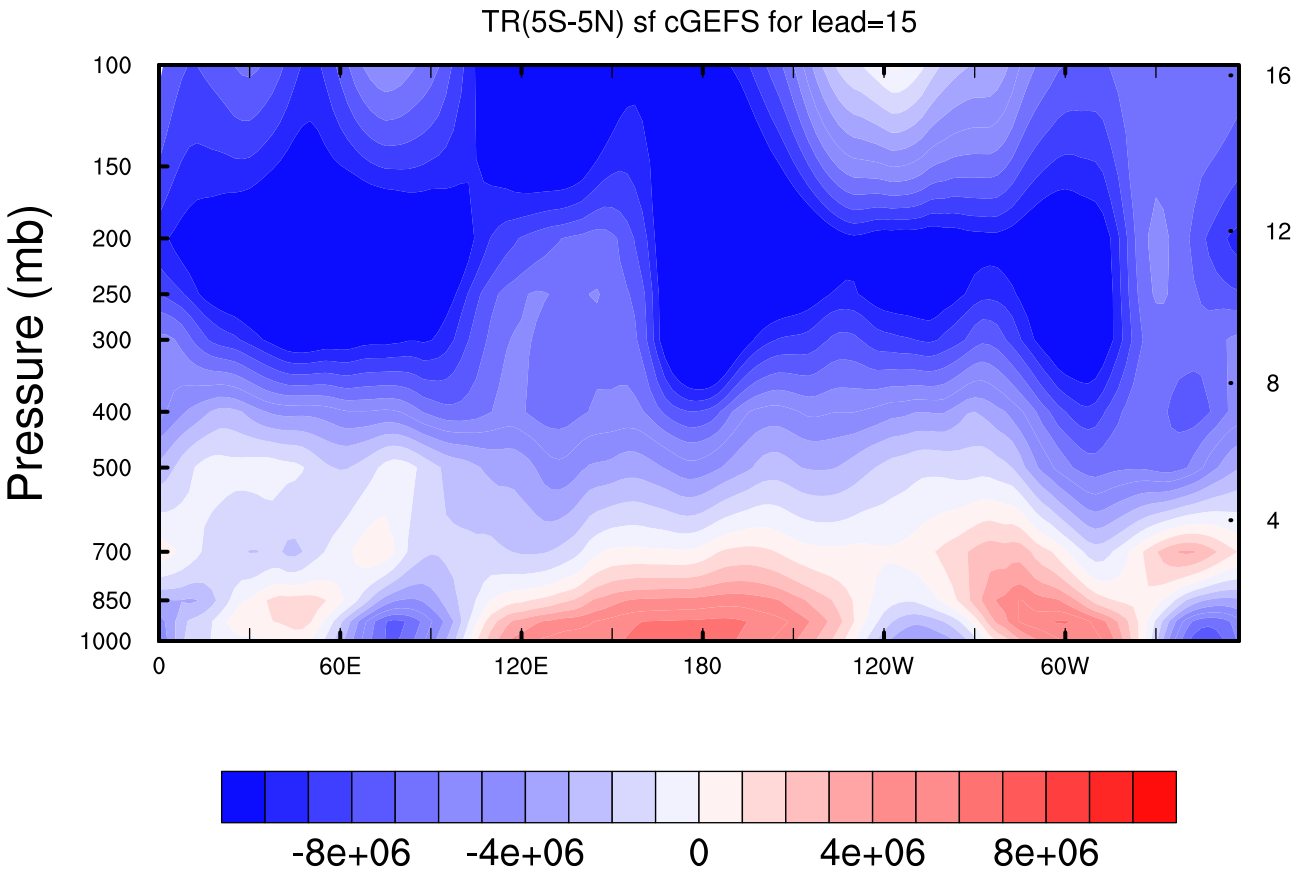
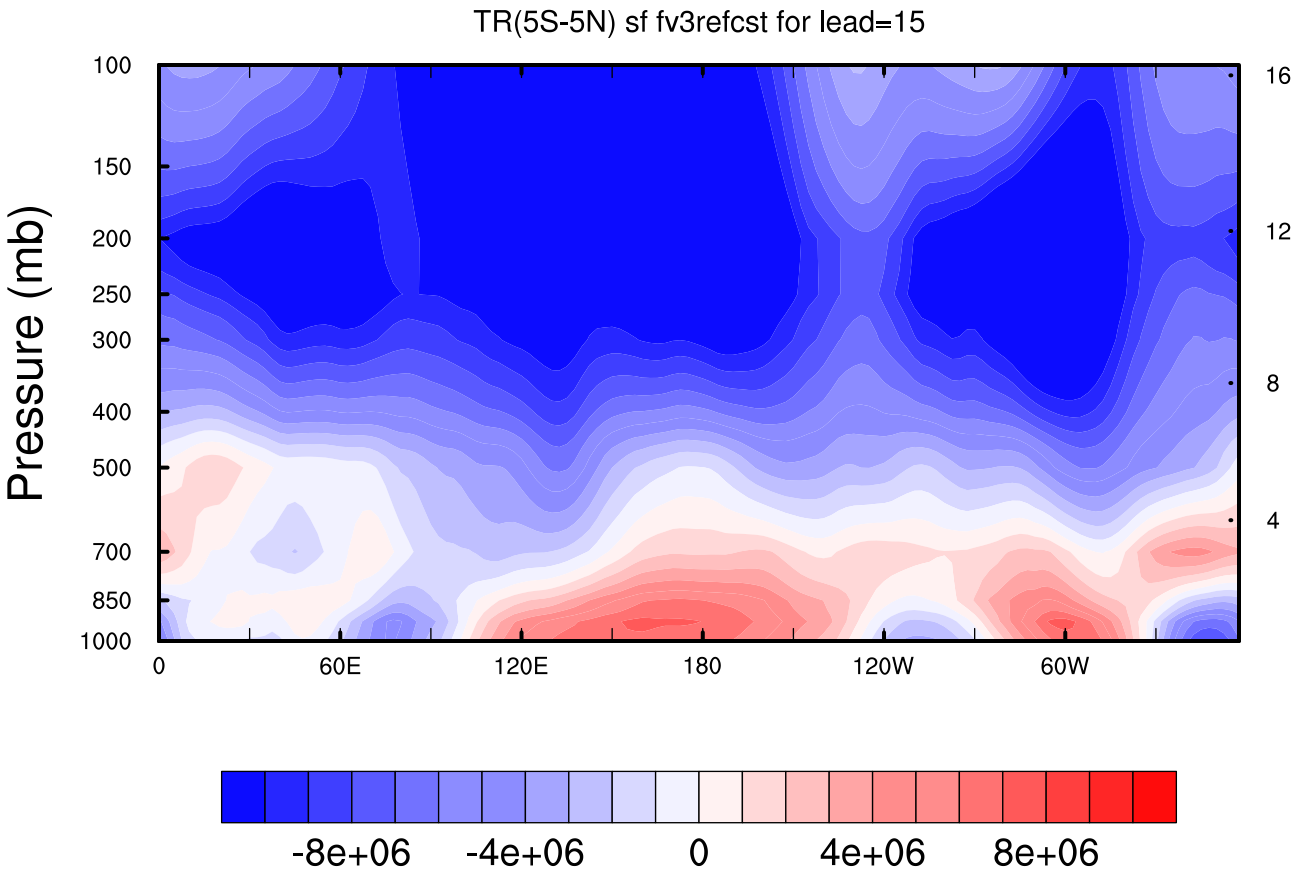
1.6e+07

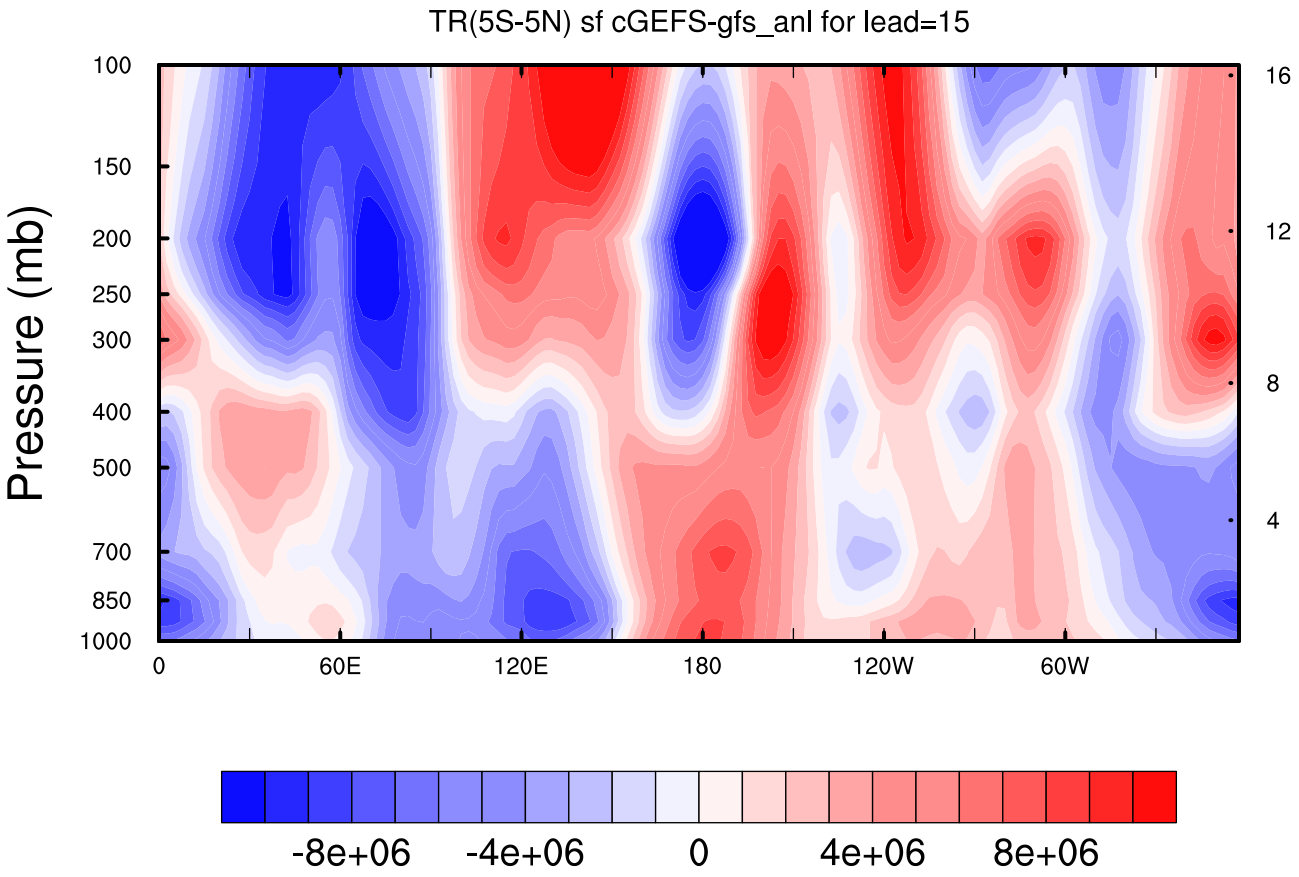

vp 200hPa cGEFS-gfs_anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

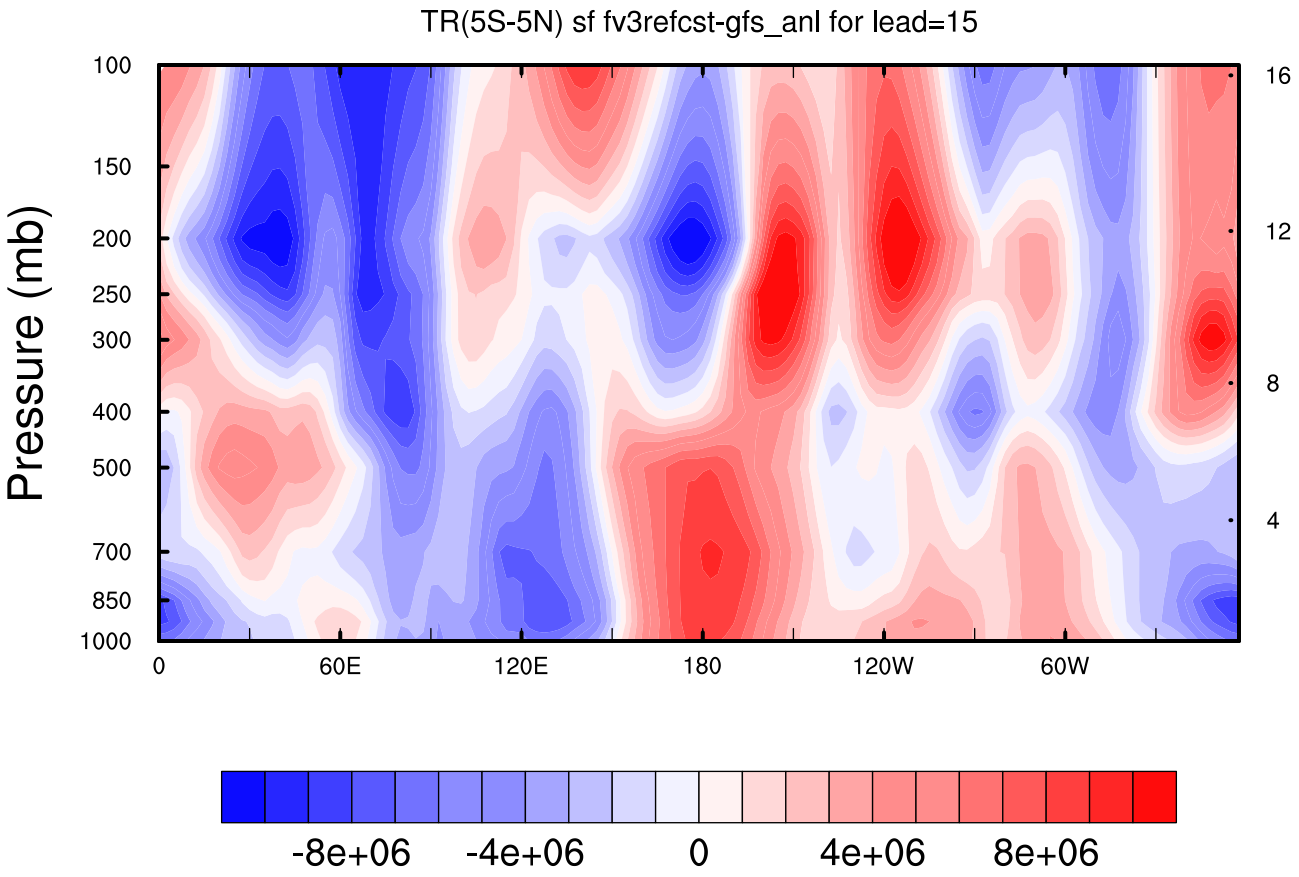

vp 200hPa fv3refcst-gfs_anl for lead=15
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

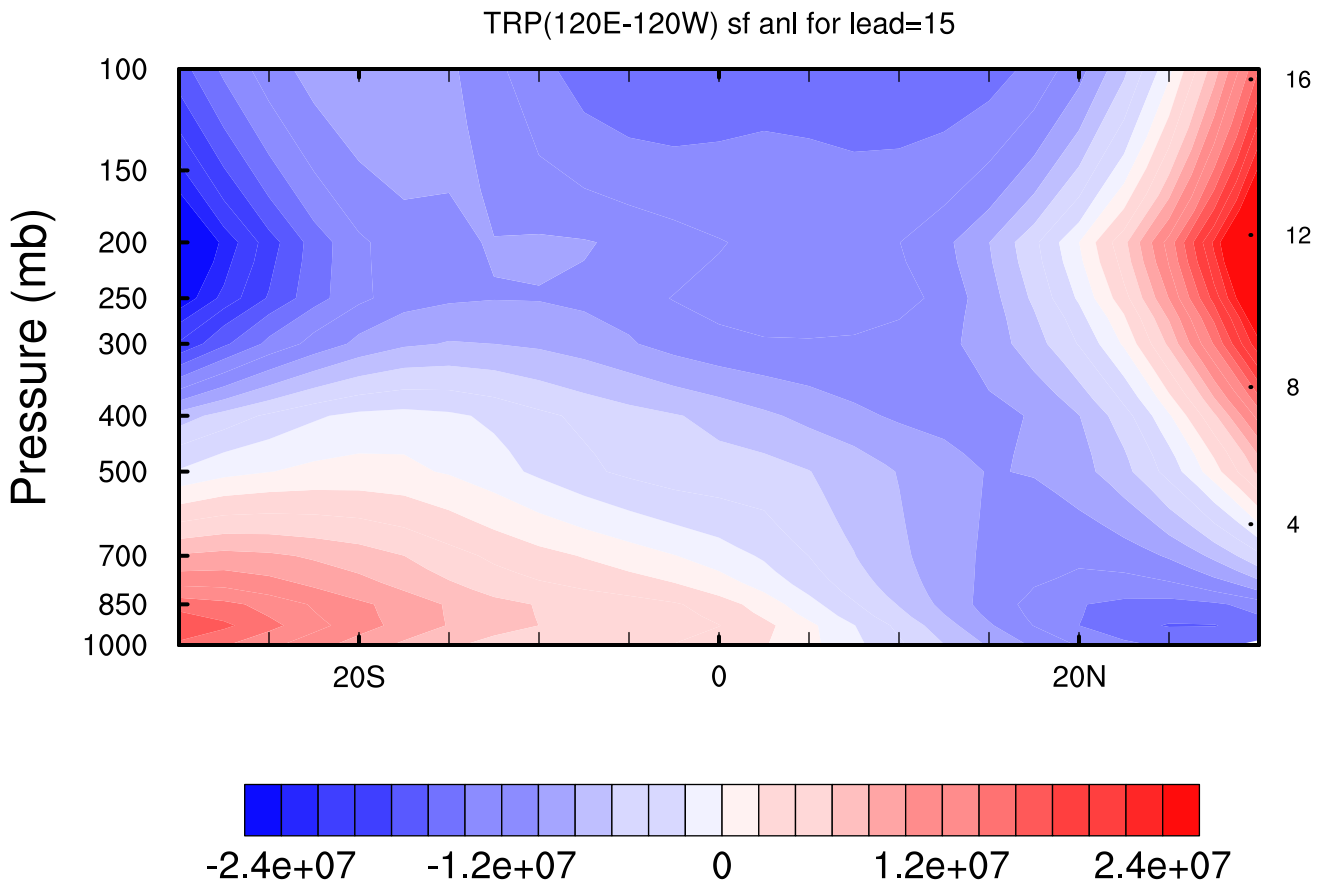

TR(5S-5N) sf anl for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

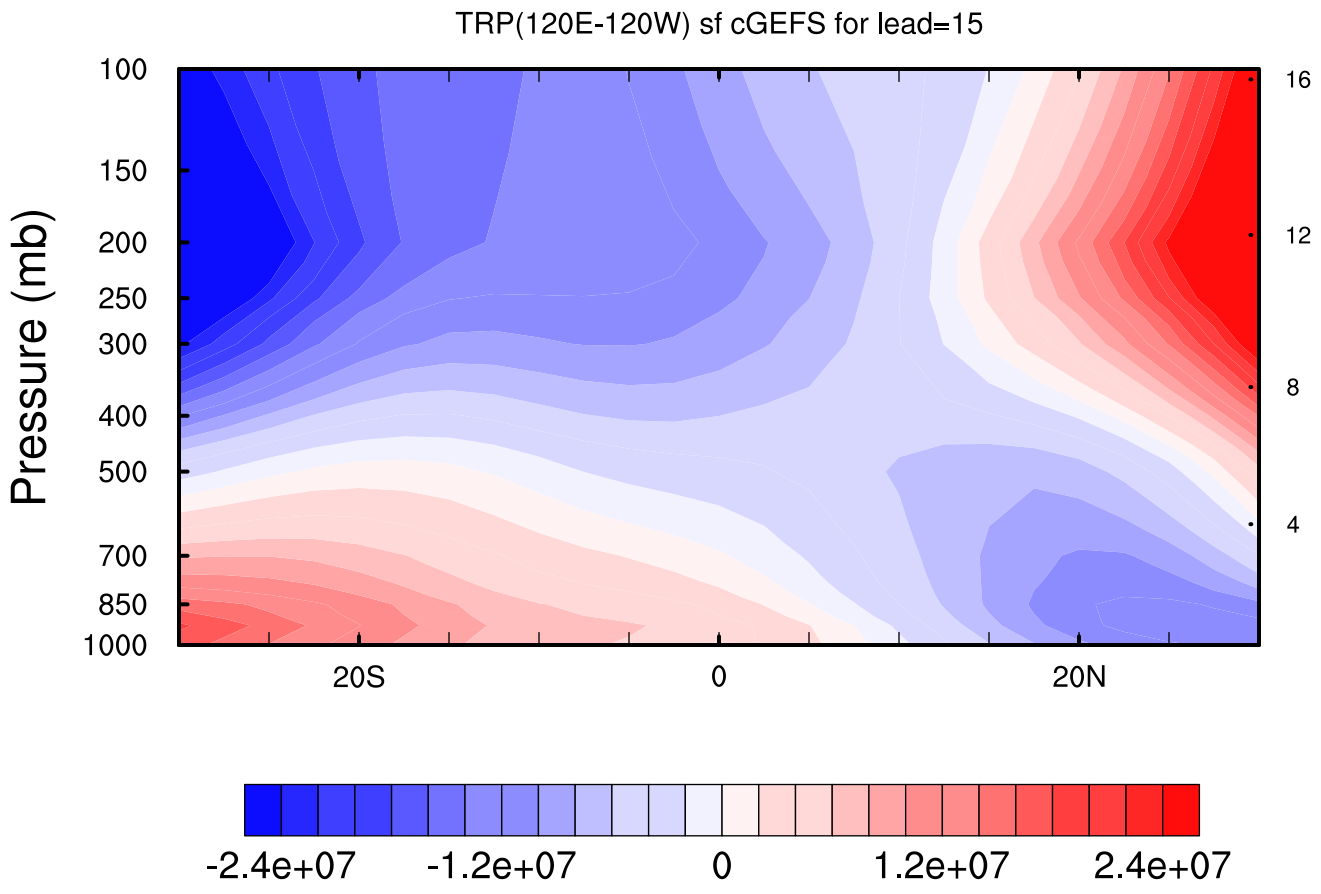

TR(5S-5N) sf cGEFS for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

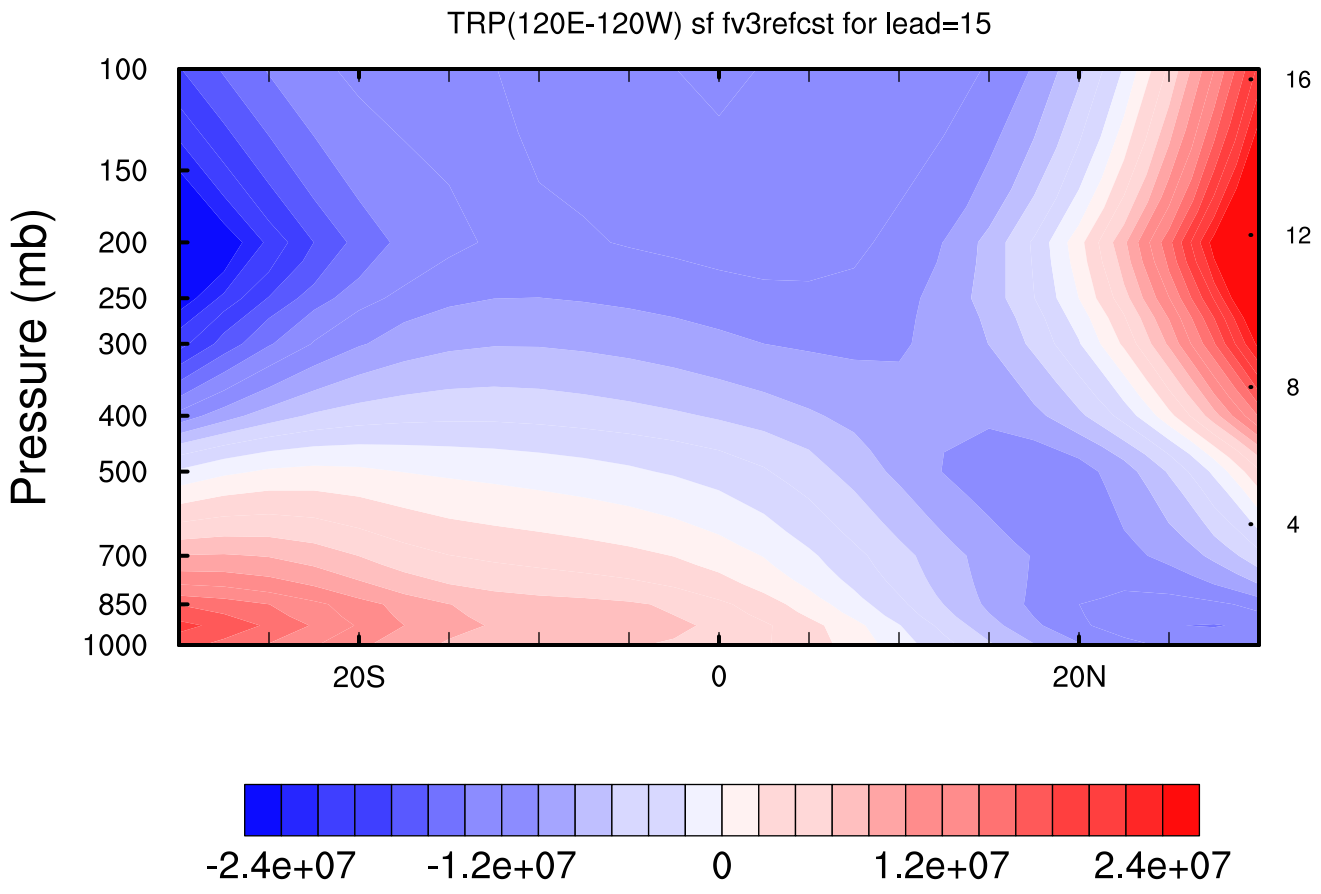

TR(5S-5N) sf fv3refcst for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

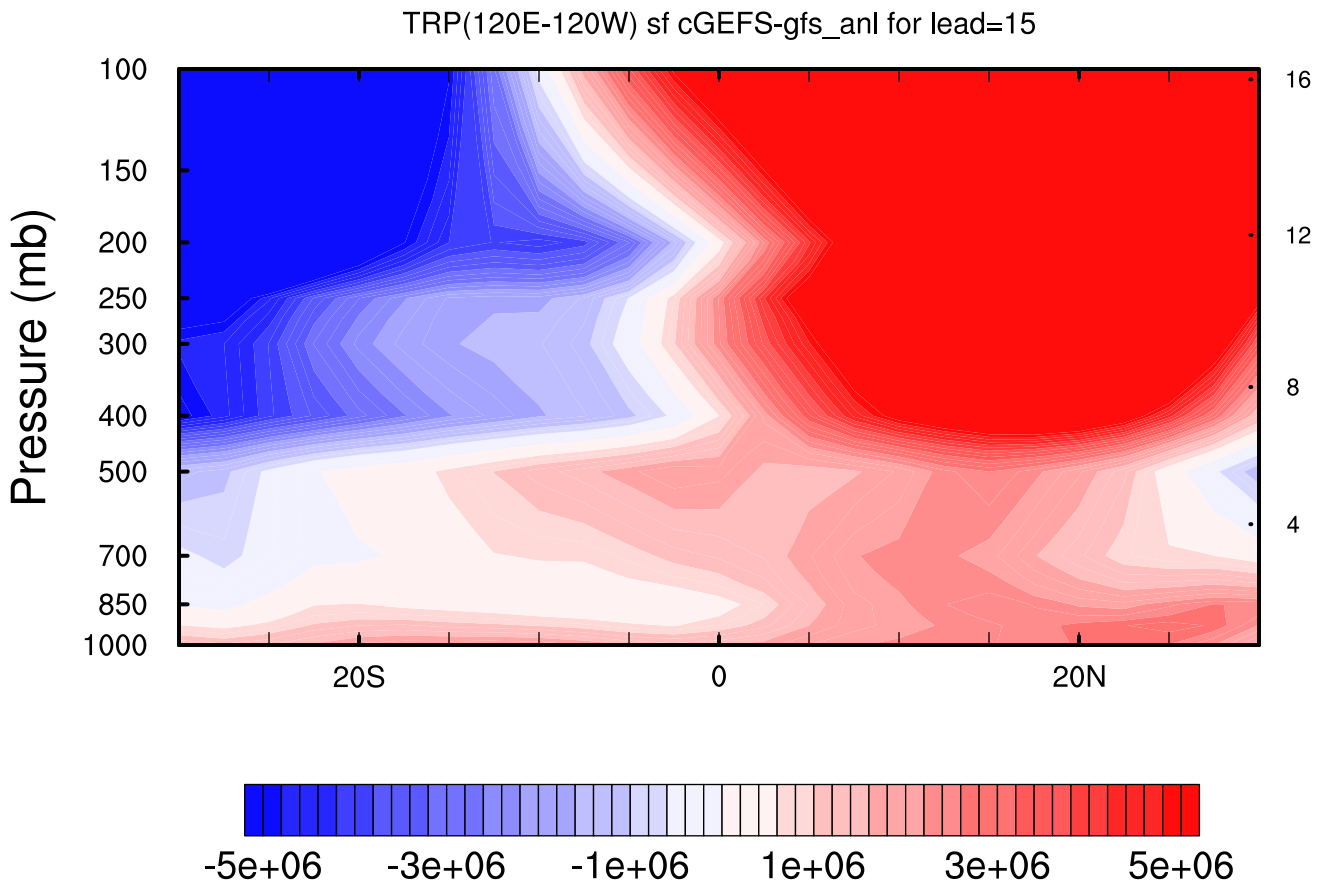

TR(5S-5N) sf cGEFS-gfs_anl for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

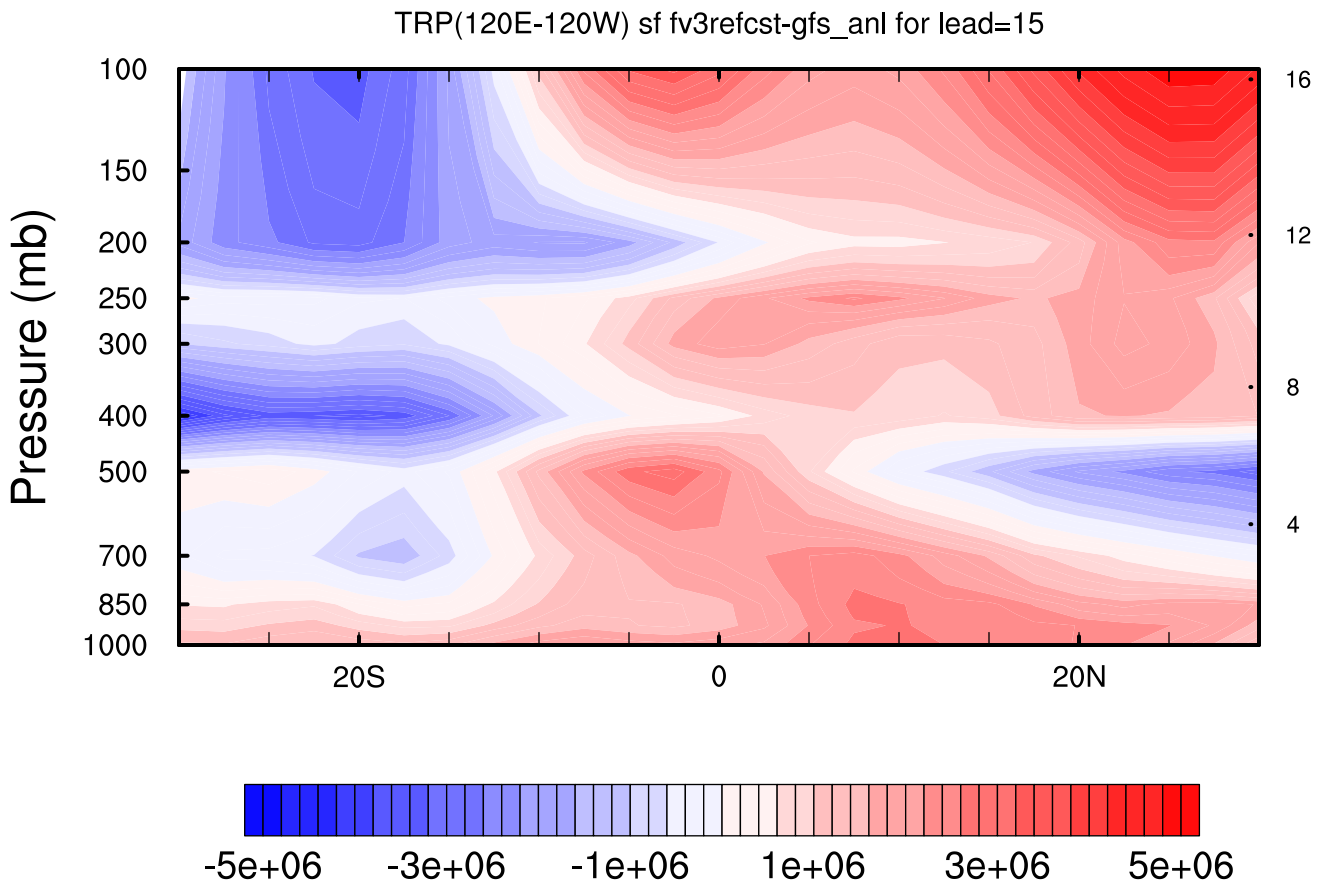

TR(5S-5N) sf fv3refcst-gfs_anl for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

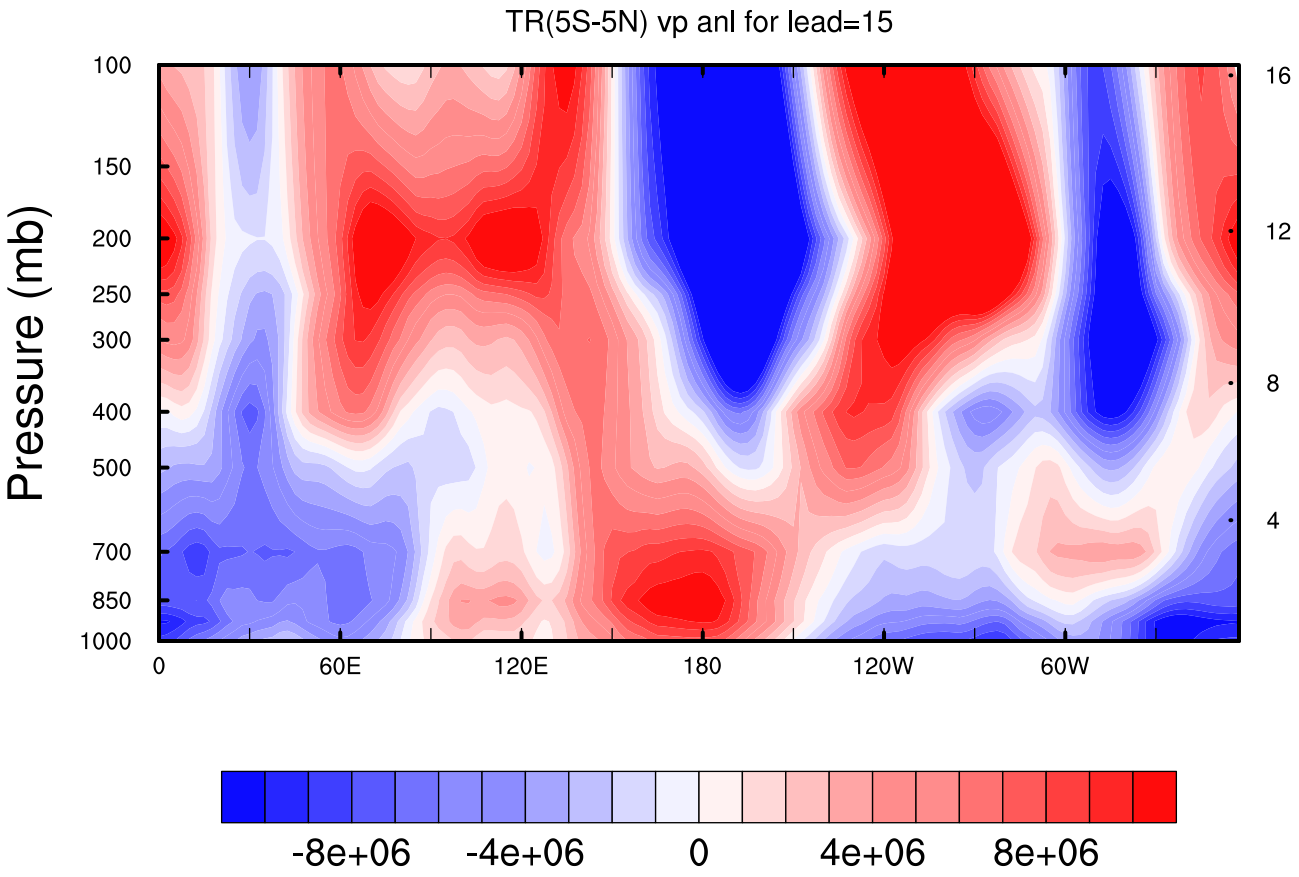

TRP(120E-120W) sf anl for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

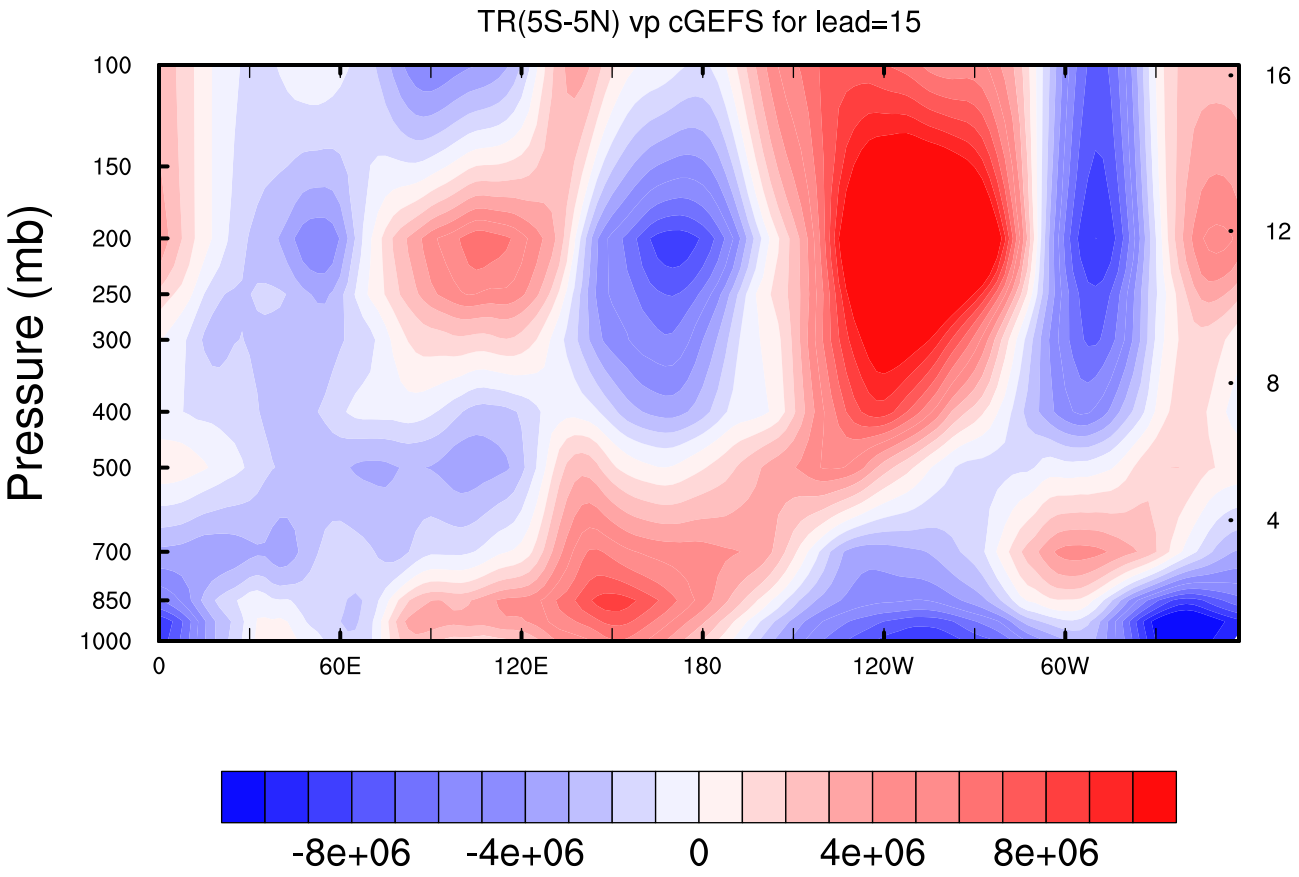

TRP(120E-120W) sf cGEFS for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

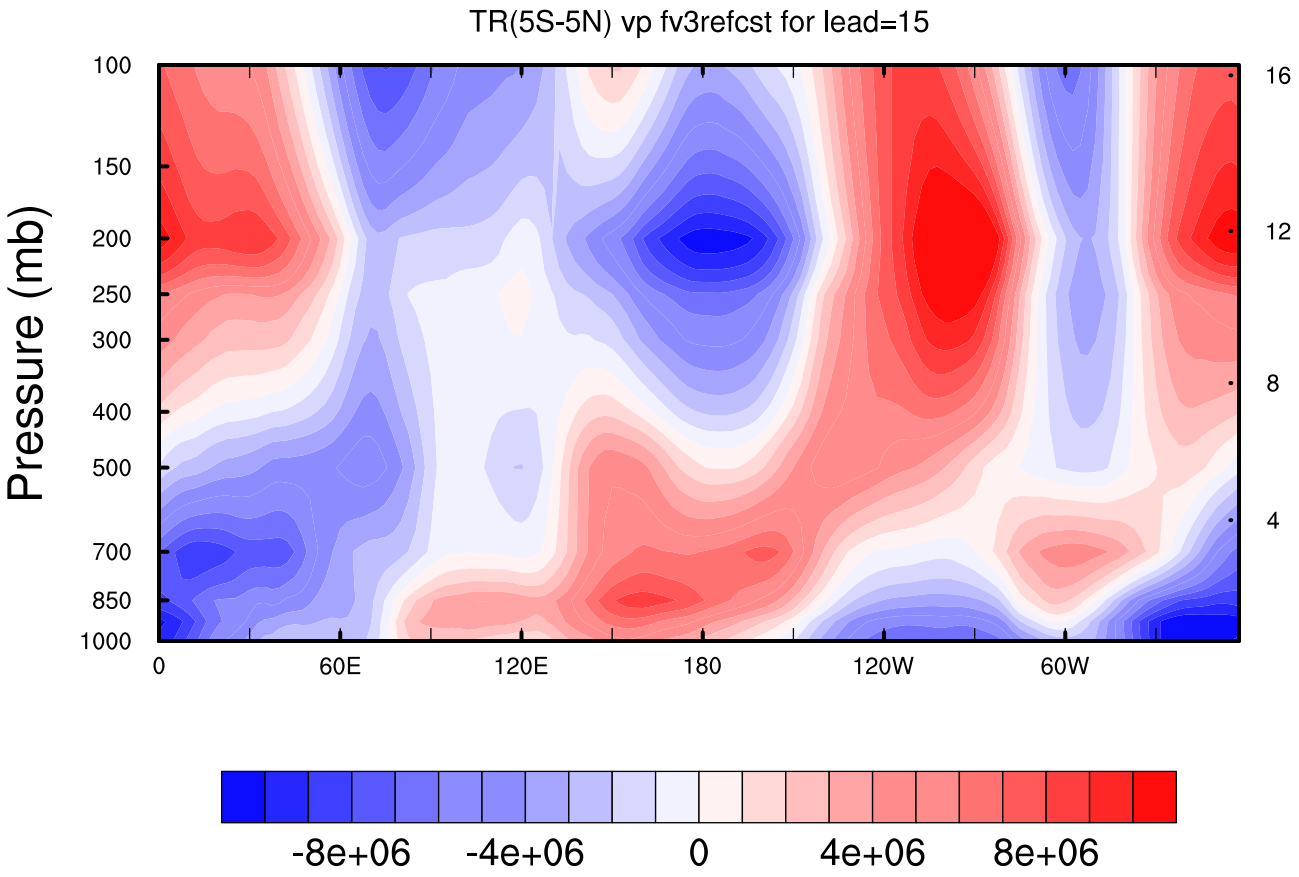

TRP(120E-120W) sf fv3refcst for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

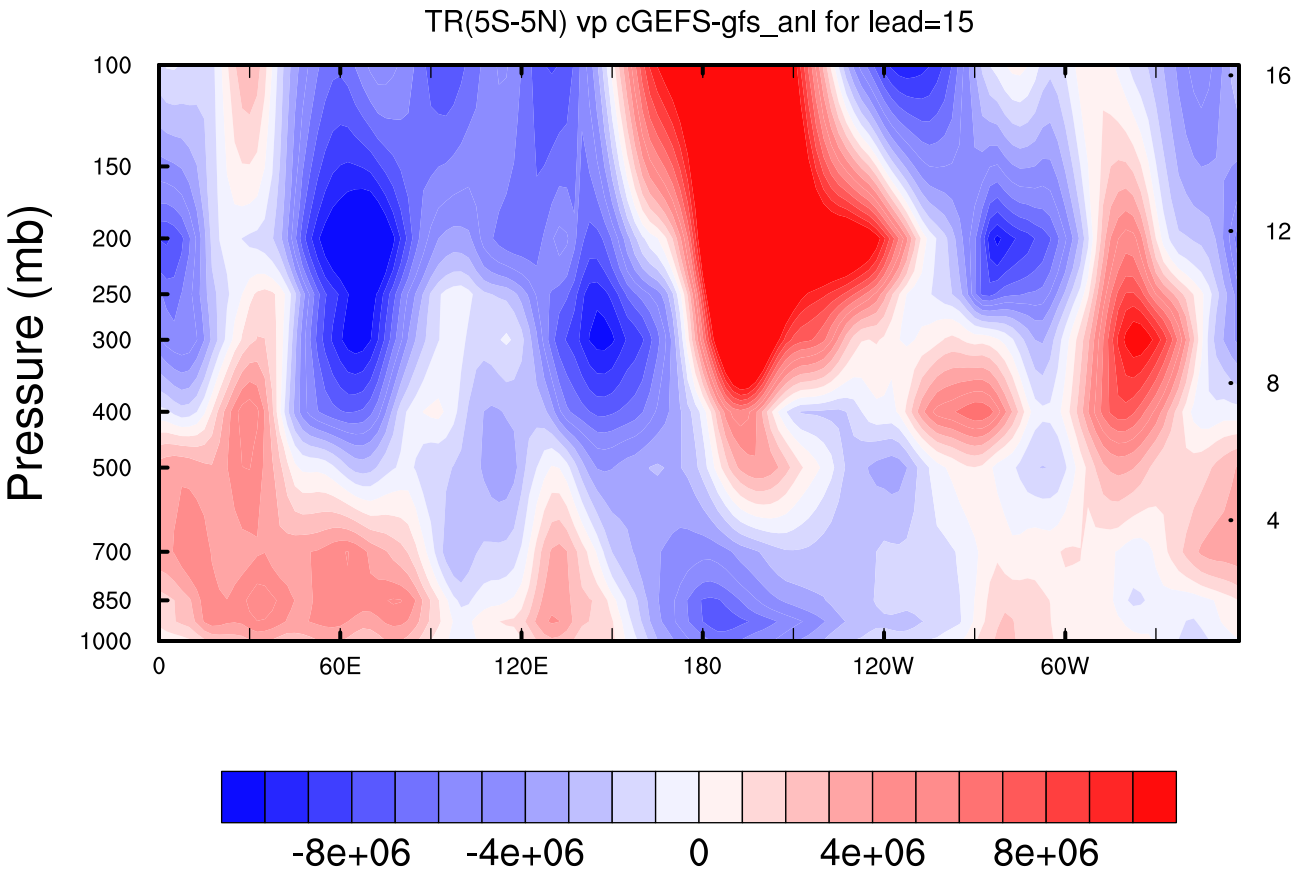

TRP(120E-120W) sf cGEFS-gfs_anl for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

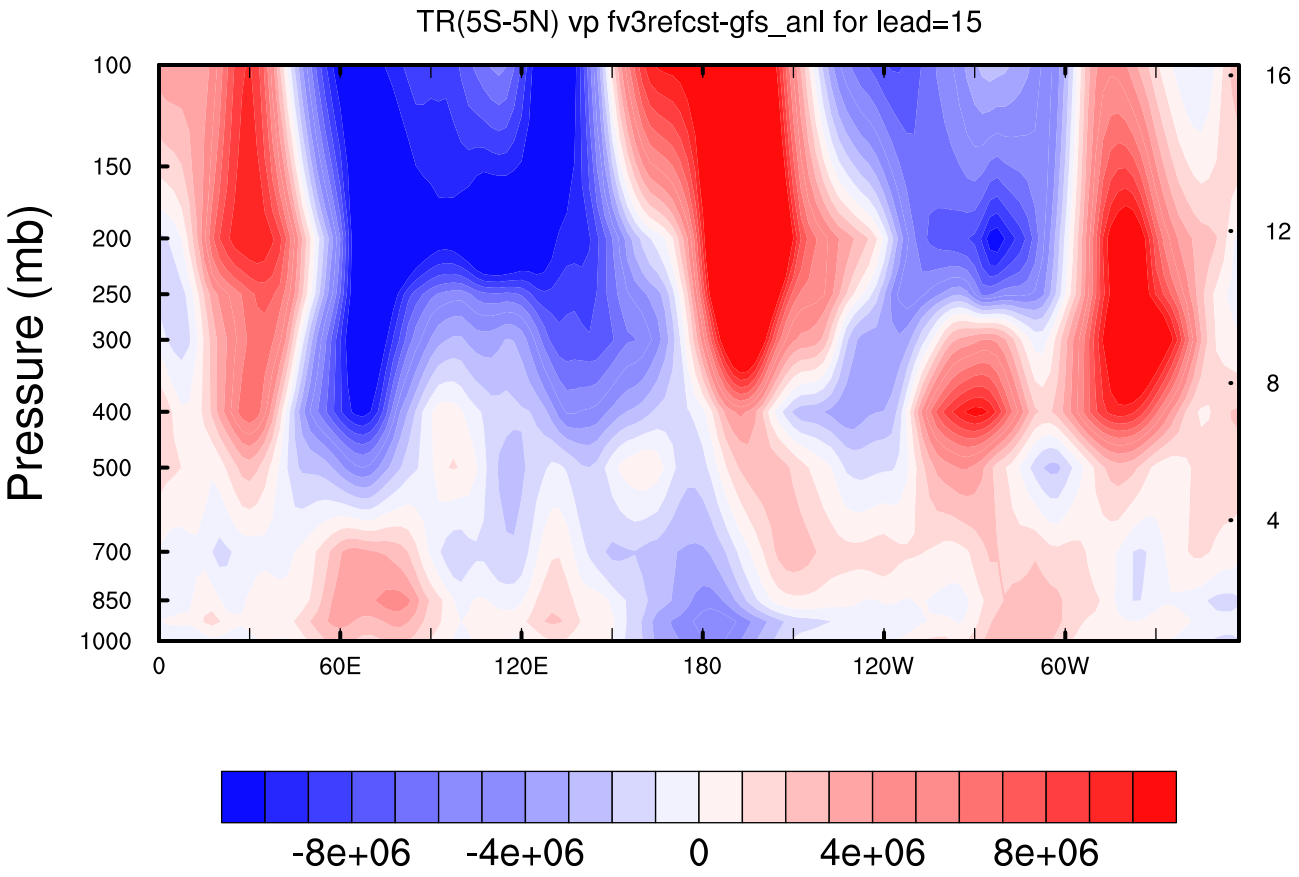

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

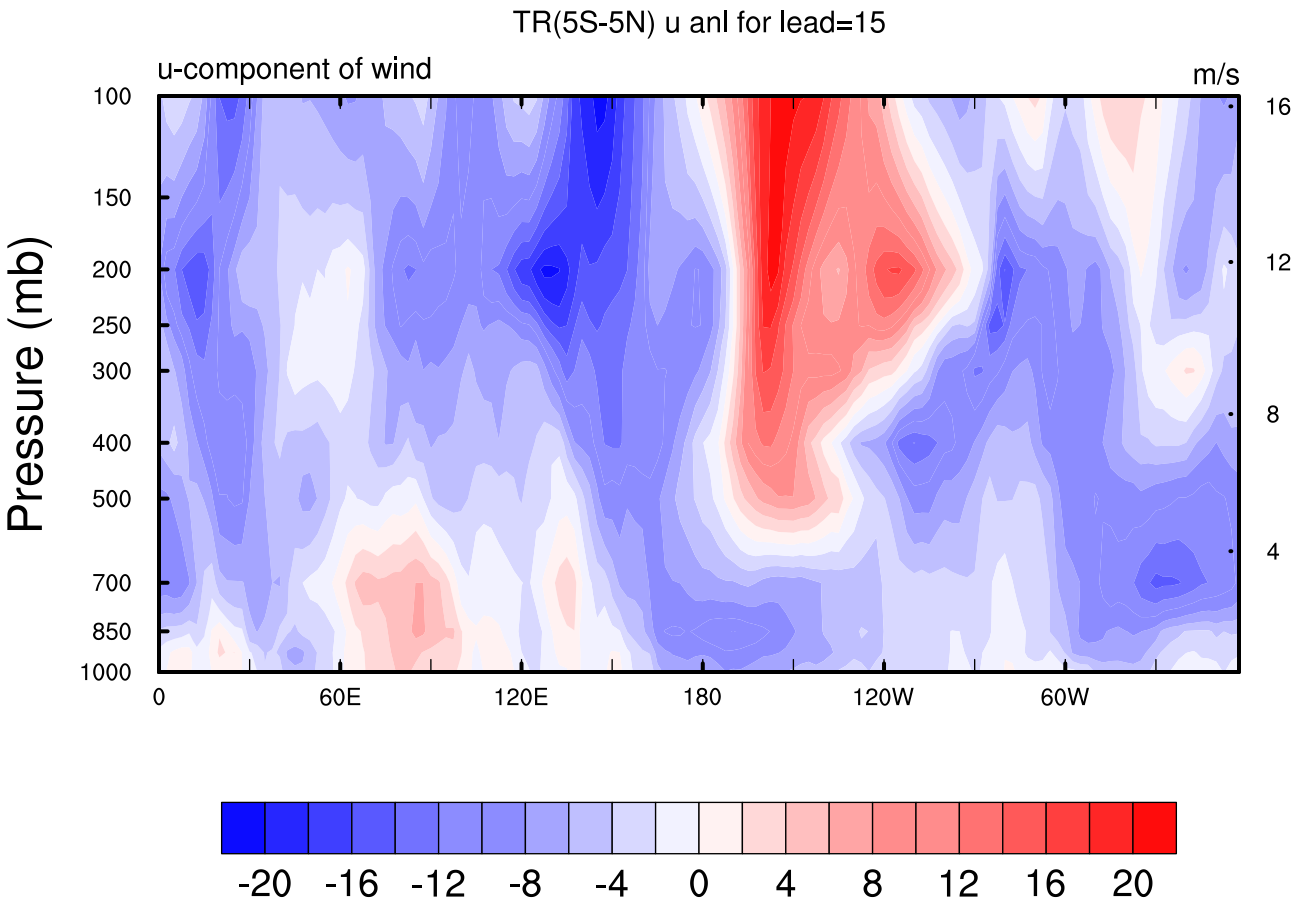

TR(5S-5N) vp anl for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

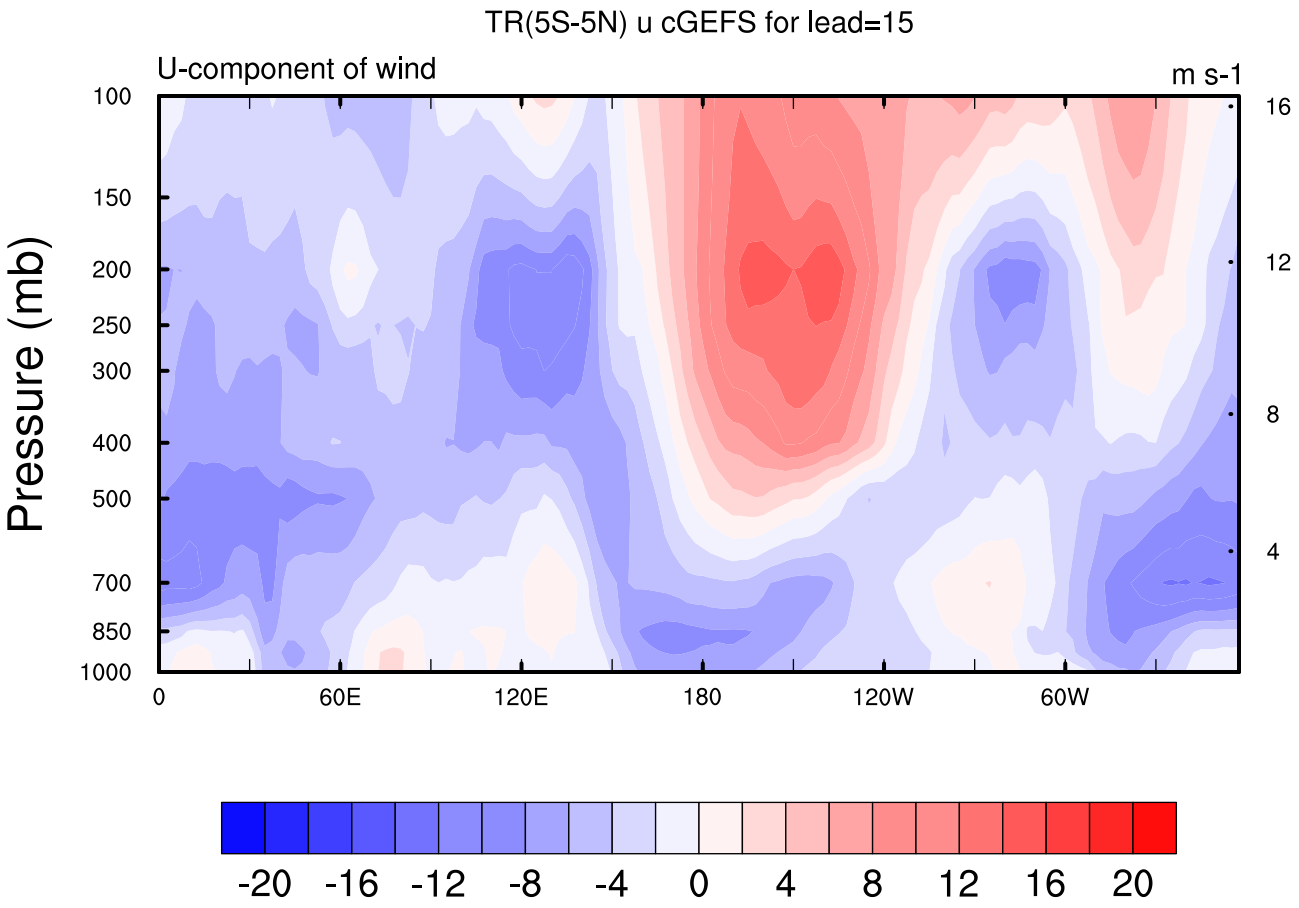

TR(5S-5N) vp cGEFS for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

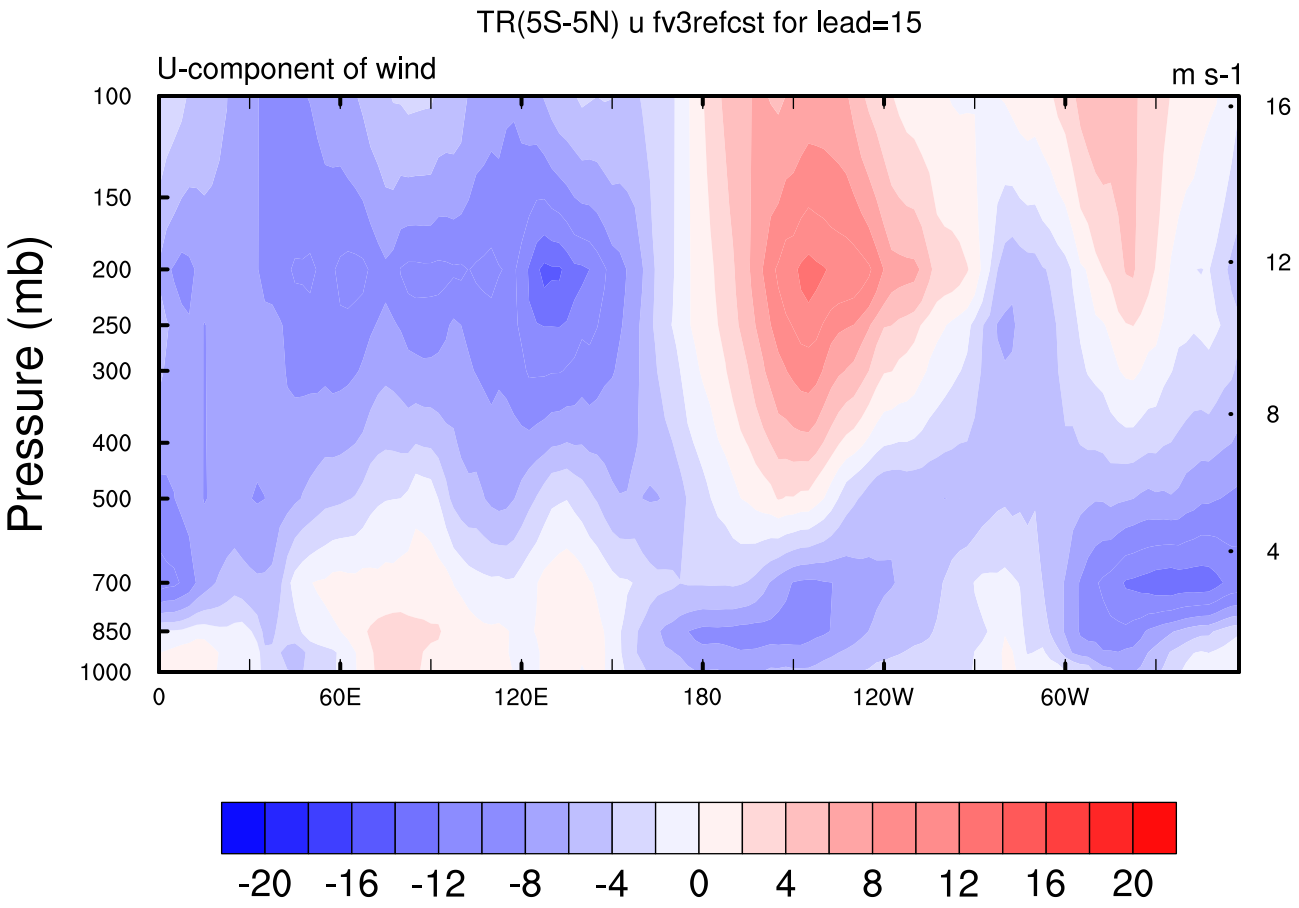

TR(5S-5N) vp fv3refcst for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

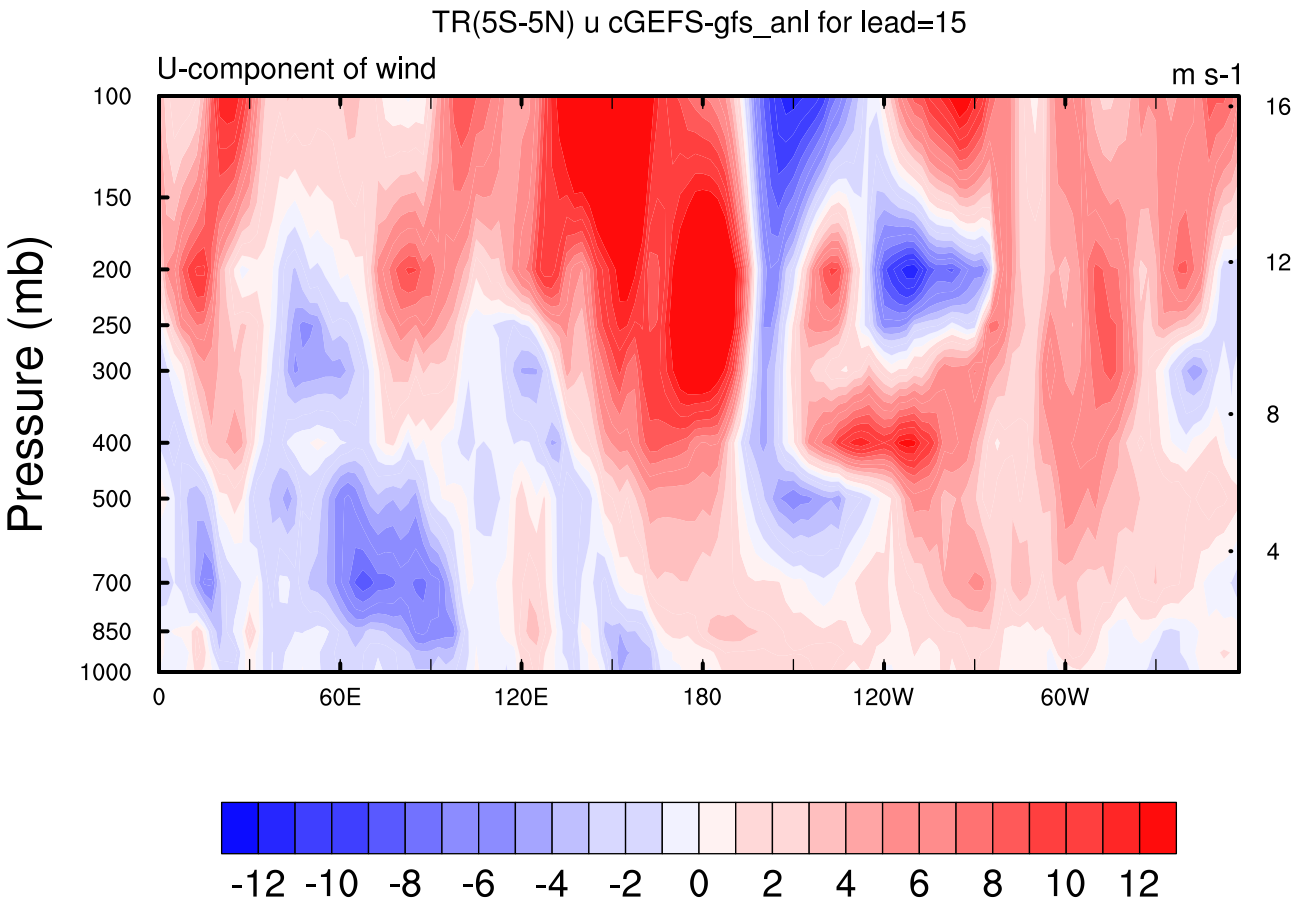

TR(5S-5N) vp cGEFS-gfs_anl for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst-gfs_anl for lead=15
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) u anl for lead=15
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS for lead=15
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u fv3refcst for lead=15
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=15
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
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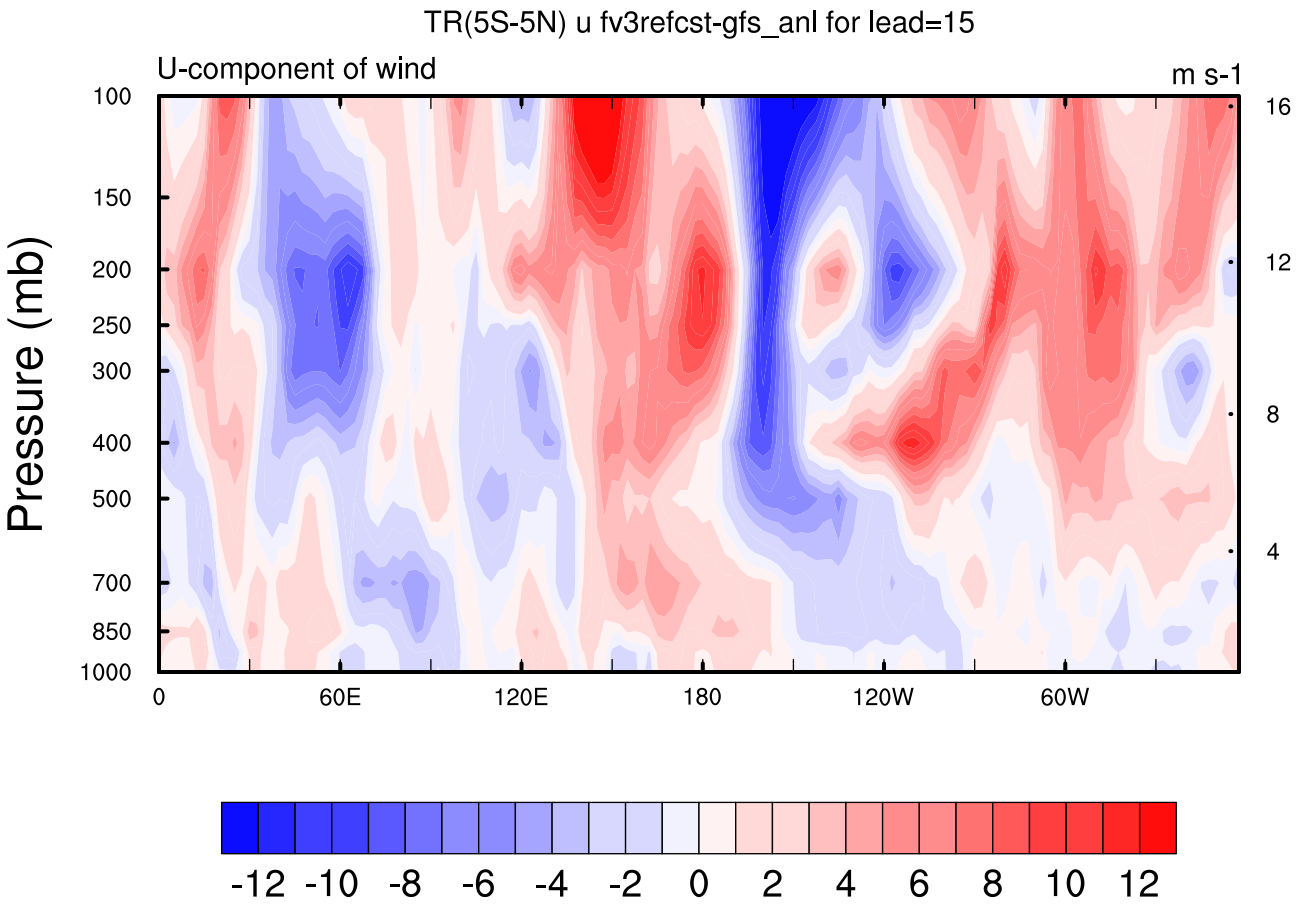
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=15
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
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4
-12
-10
-8
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-4
-2
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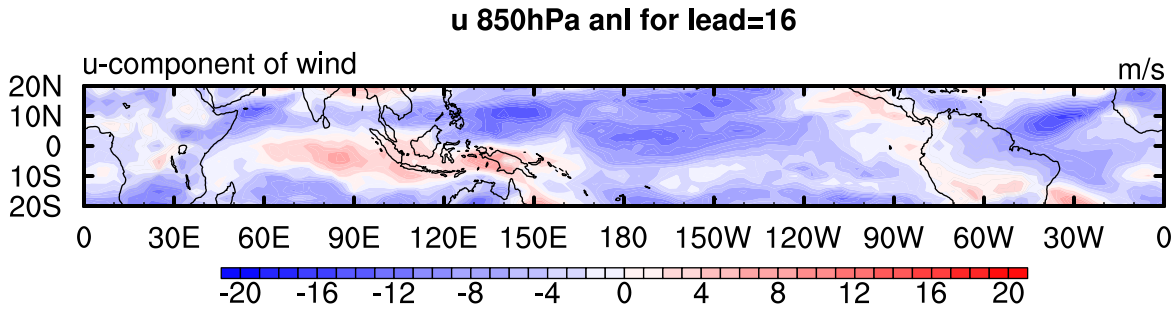
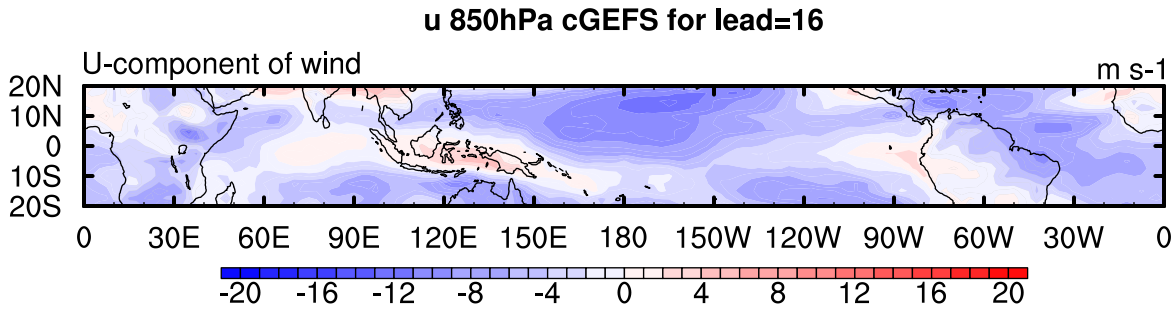
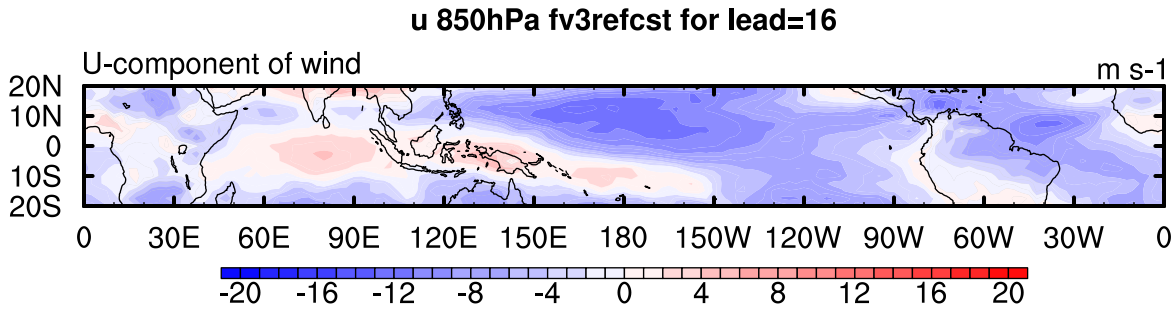
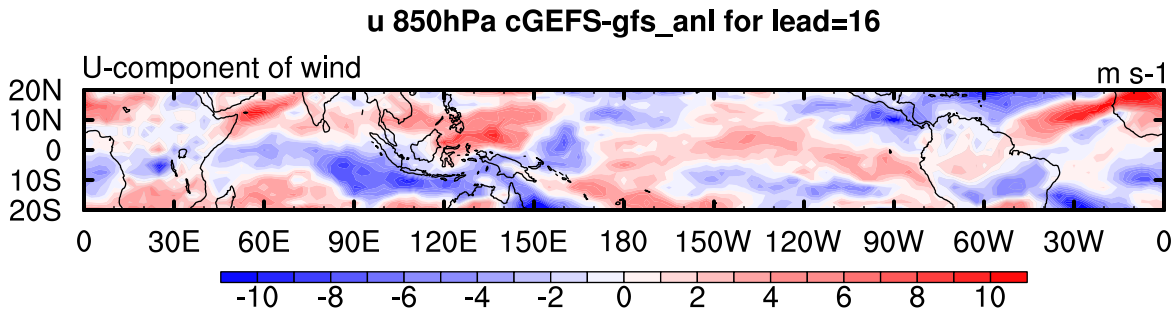
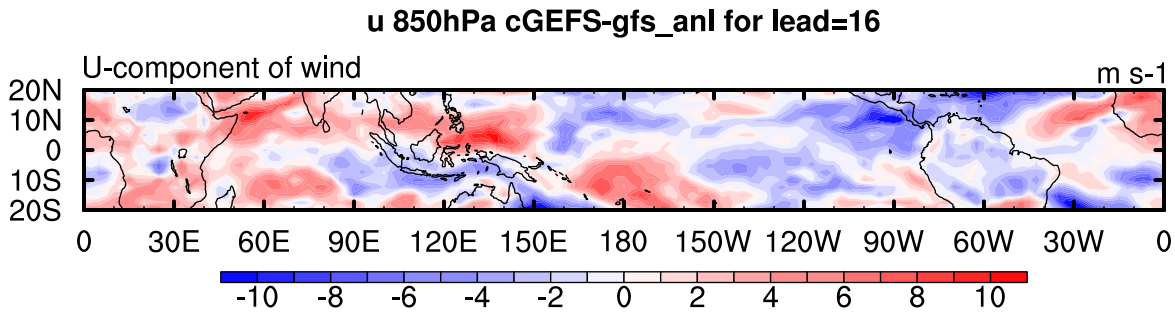
2
4
6
8
10
12

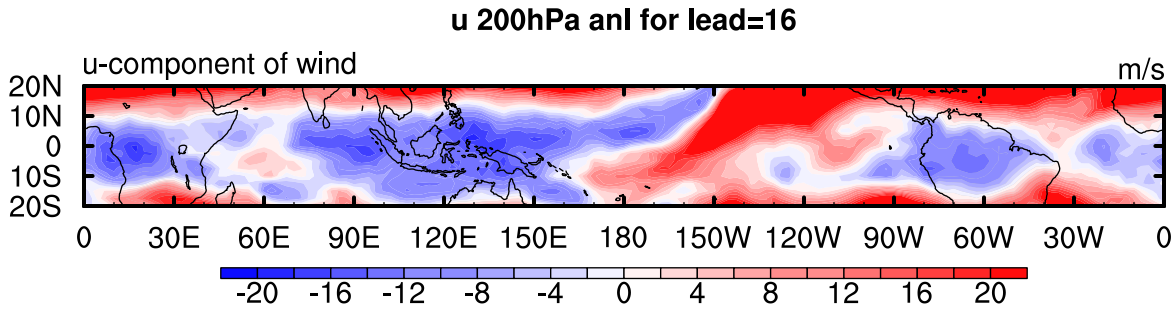

u 850hPa anl for lead=16
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

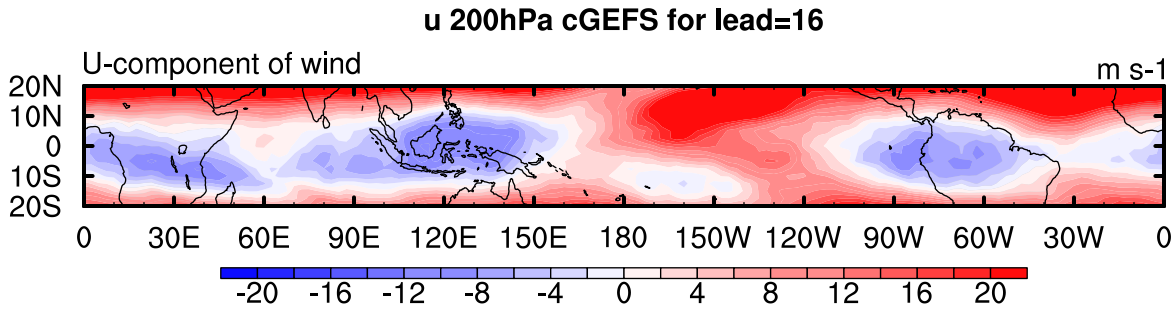

u 850hPa cGEFS for lead=16
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

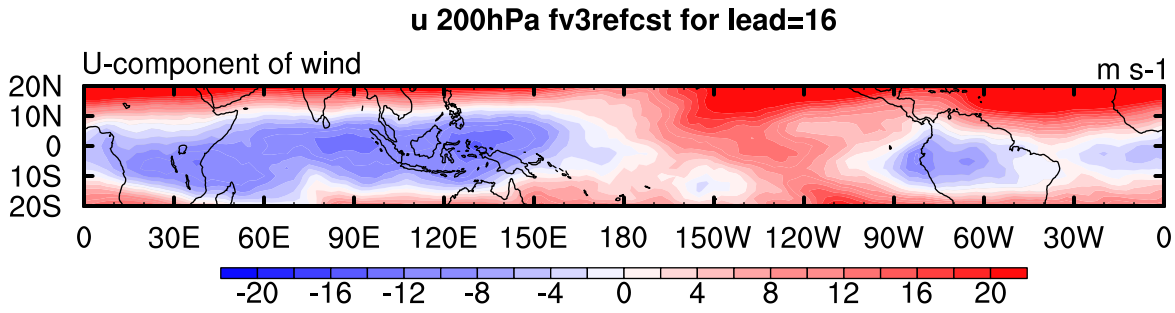

u 850hPa fv3refcst for lead=16
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=16
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 850hPa cGEFS-gfs_anl for lead=16
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=16
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=16
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=16
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-20
-16
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-4
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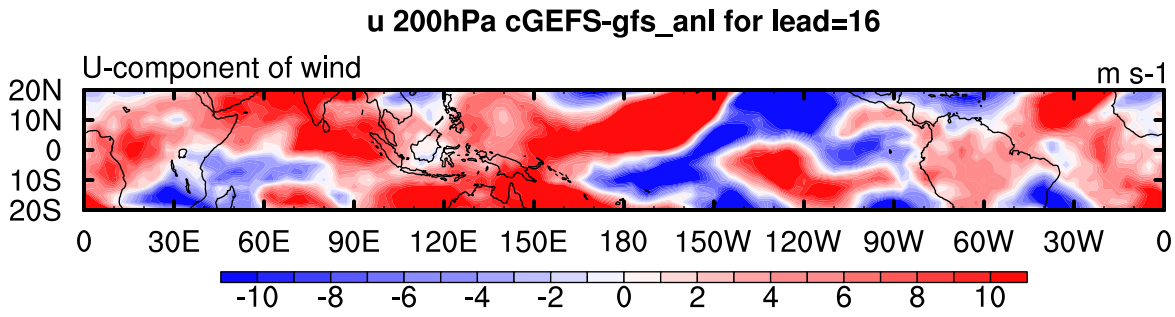
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=16
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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60W
30W
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-4
-2
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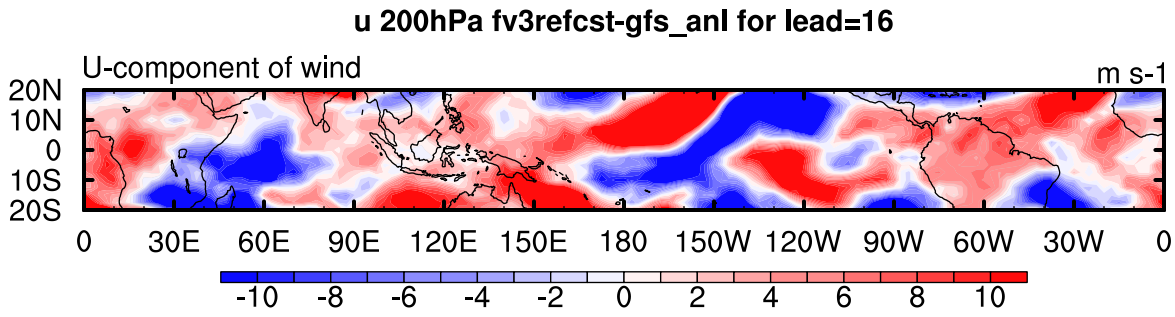
u 200hPa fv3refcst-gfs_anl for lead=16
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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60W
30W
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-10
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-2
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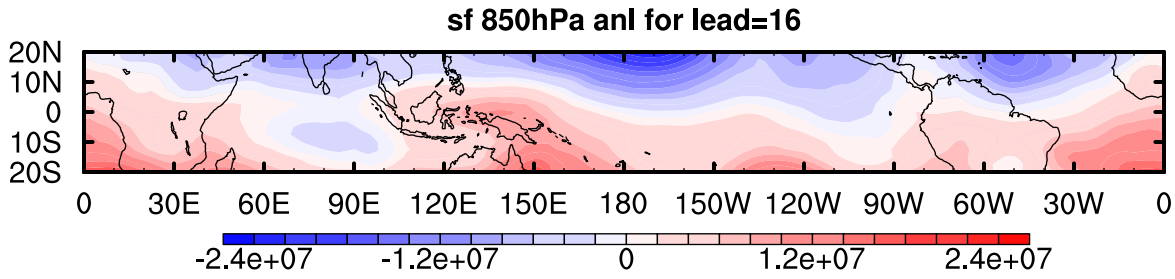
2
4
6
8
10


sf 850hPa anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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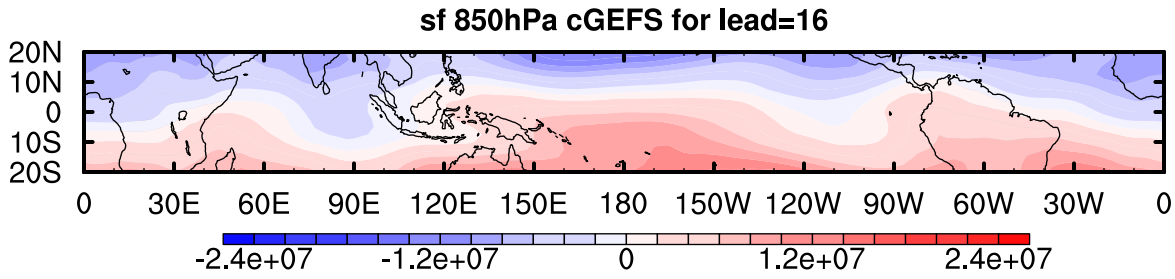
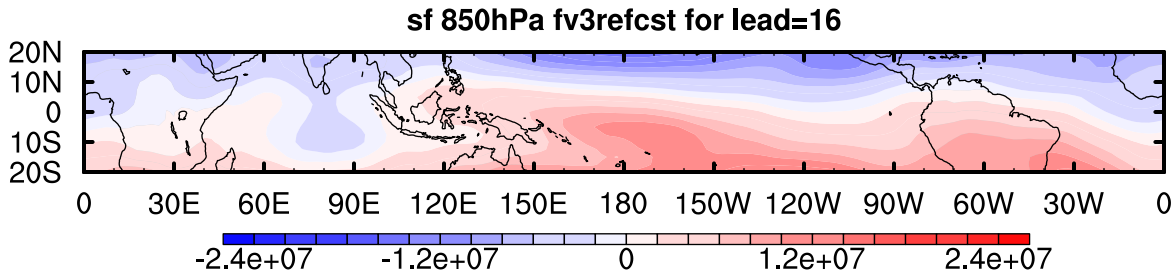
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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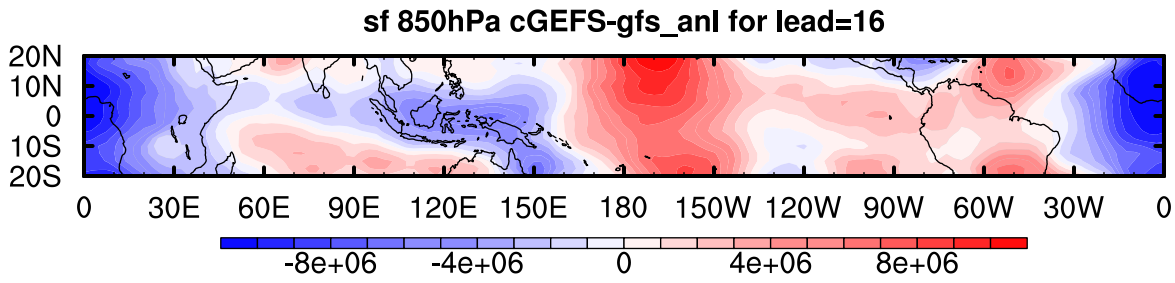
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
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150W
120W
90W
60W
30W
0
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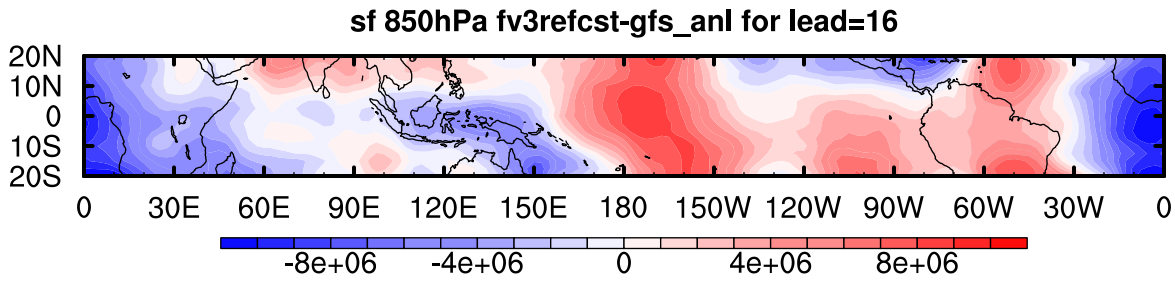
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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180
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120W
90W
60W
30W
0
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-4e+06
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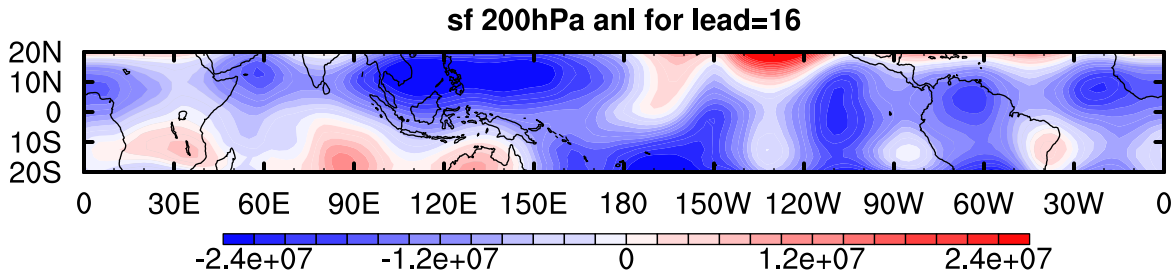
8e+06


sf 200hPa anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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60W
30W
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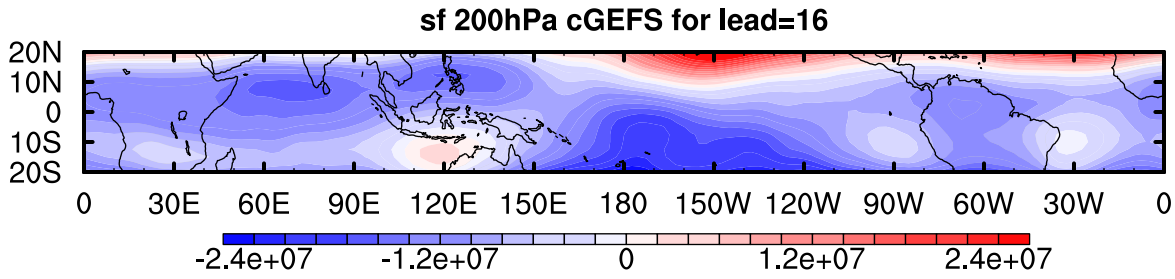
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
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60W
30W
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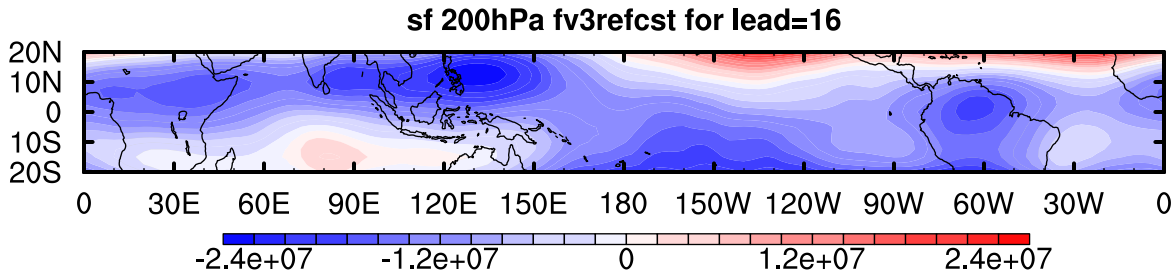
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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30W
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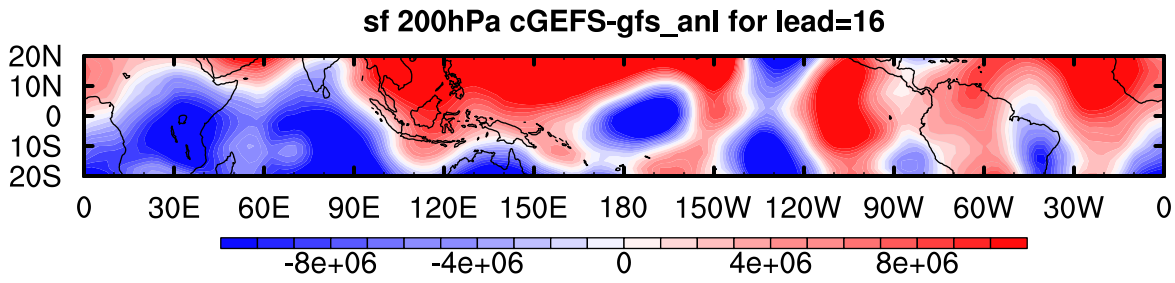
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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180
150W
120W
90W
60W
30W
0
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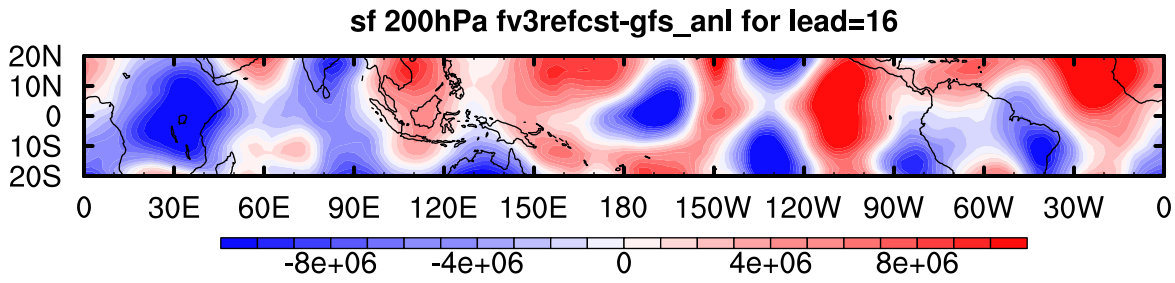
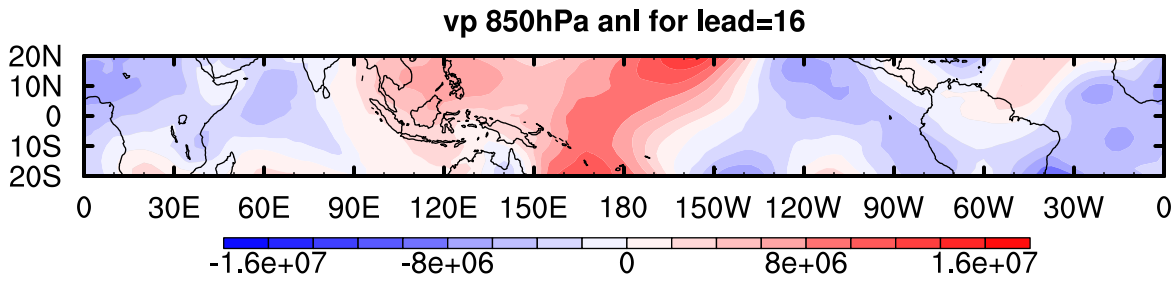
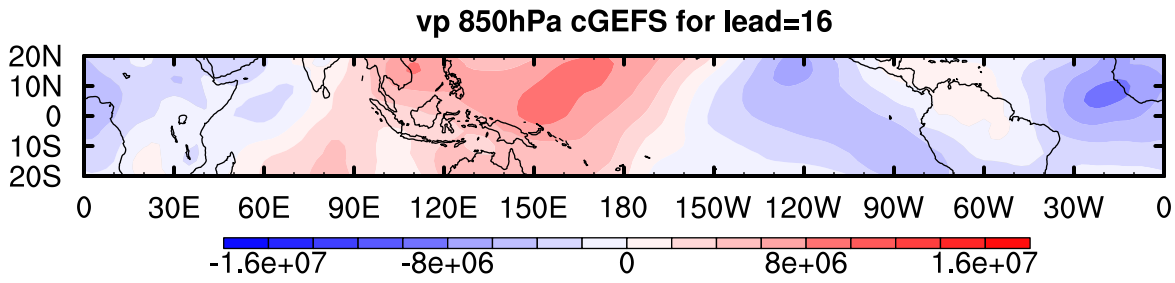
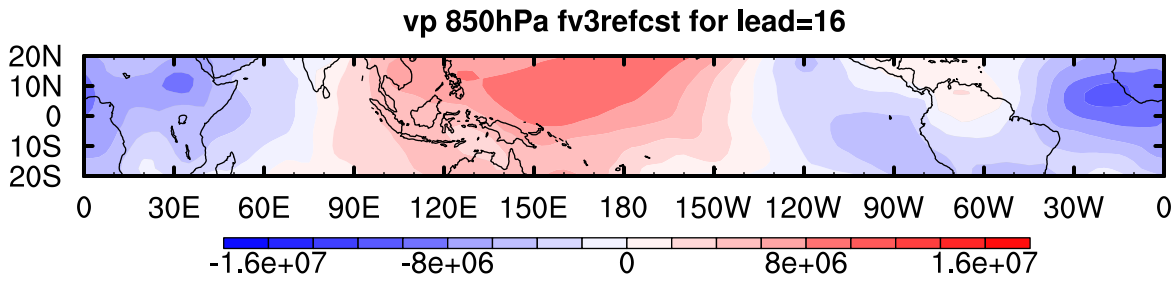
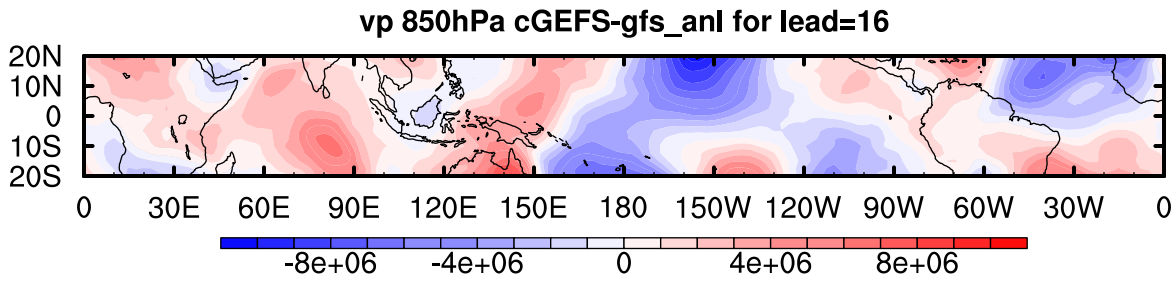
-4e+06
0
4e+06
8e+06

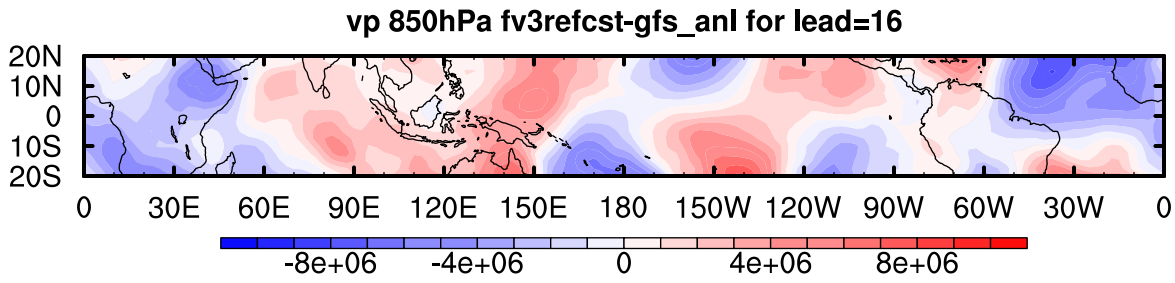

sf 200hPa fv3refcst-gfs_anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

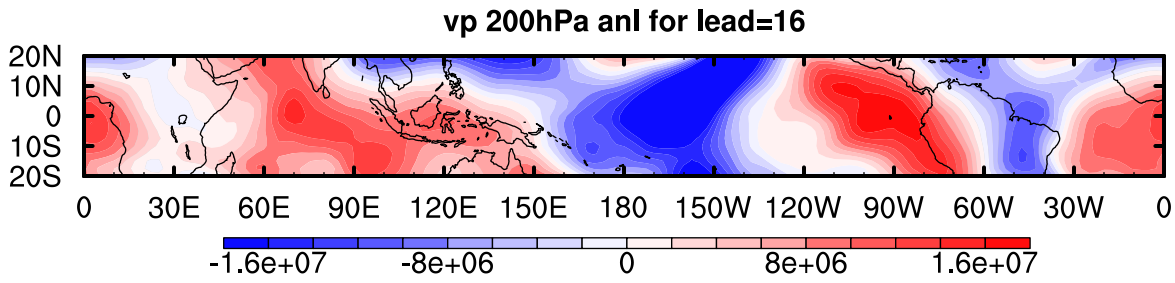

vp 850hPa anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 200hPa anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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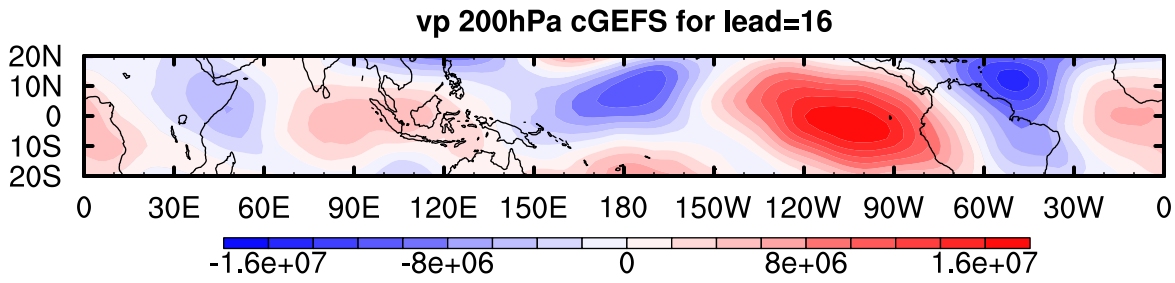
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa cGEFS for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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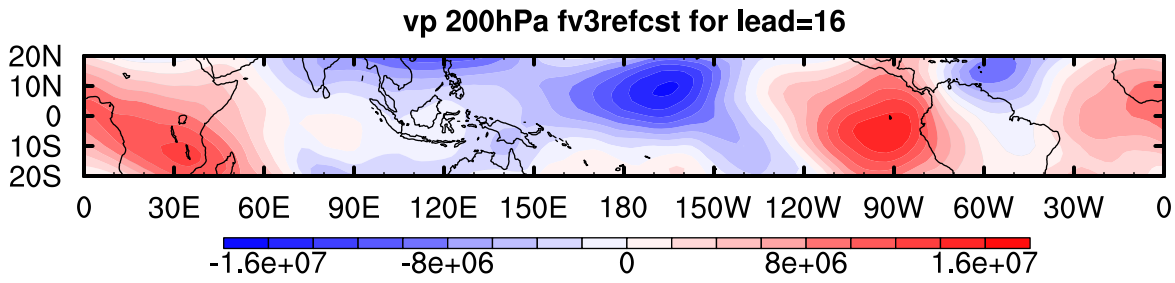
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa fv3refcst for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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150W
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90W
60W
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0
-1.6e+07
-8e+06
0
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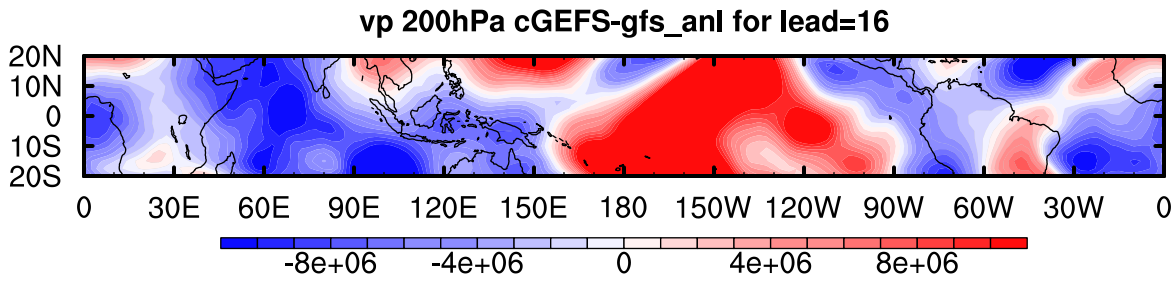
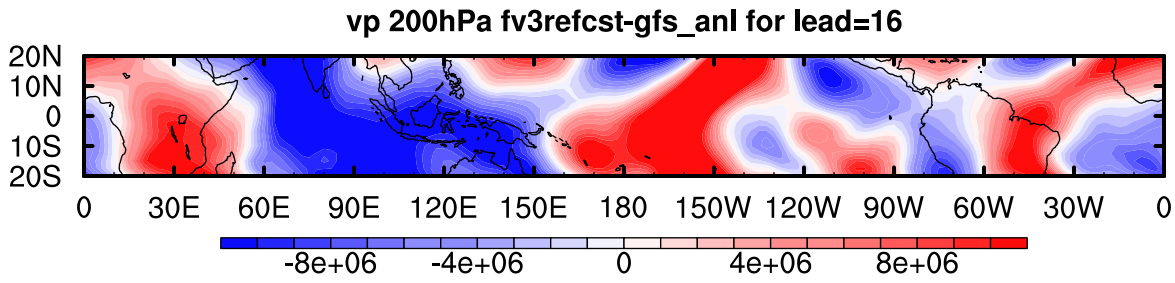
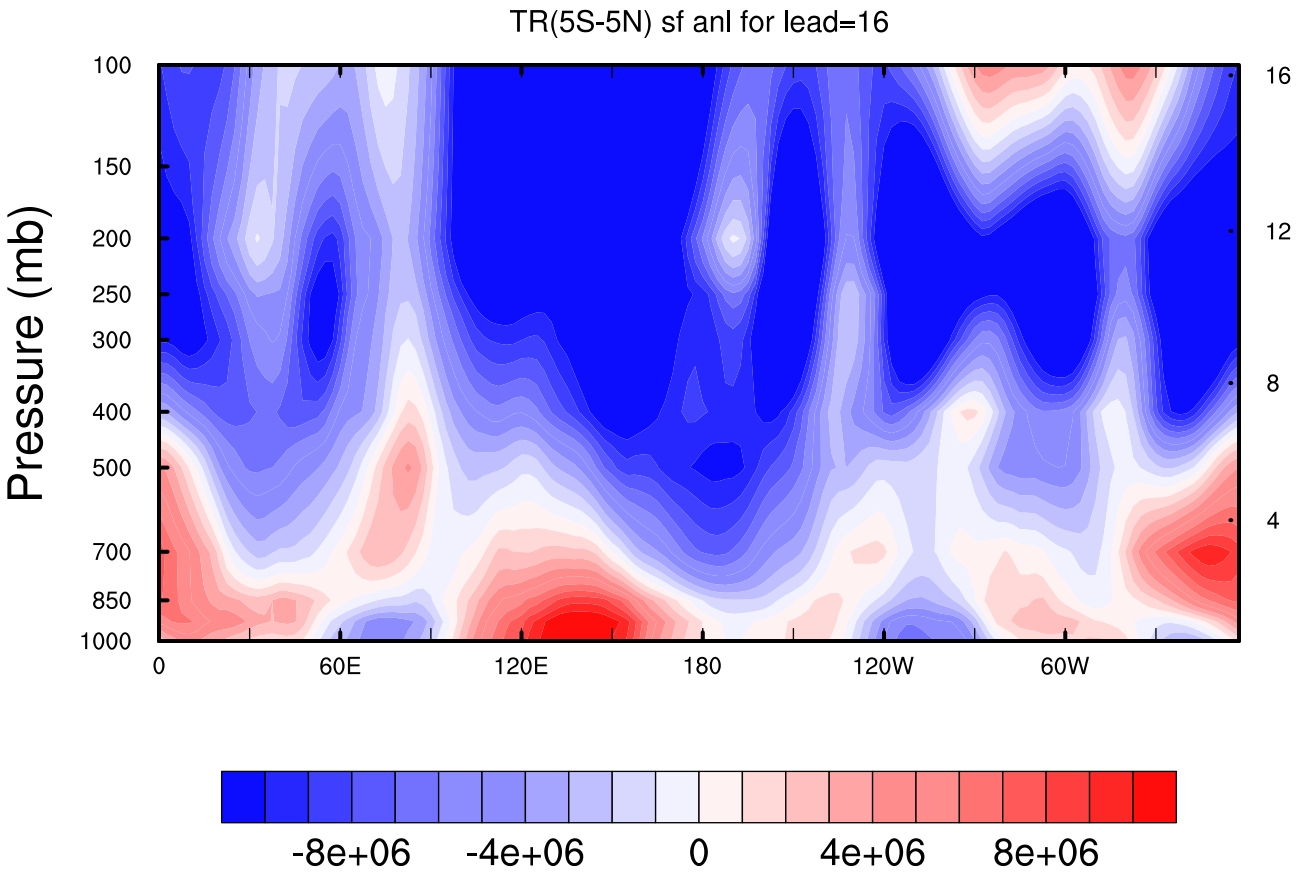
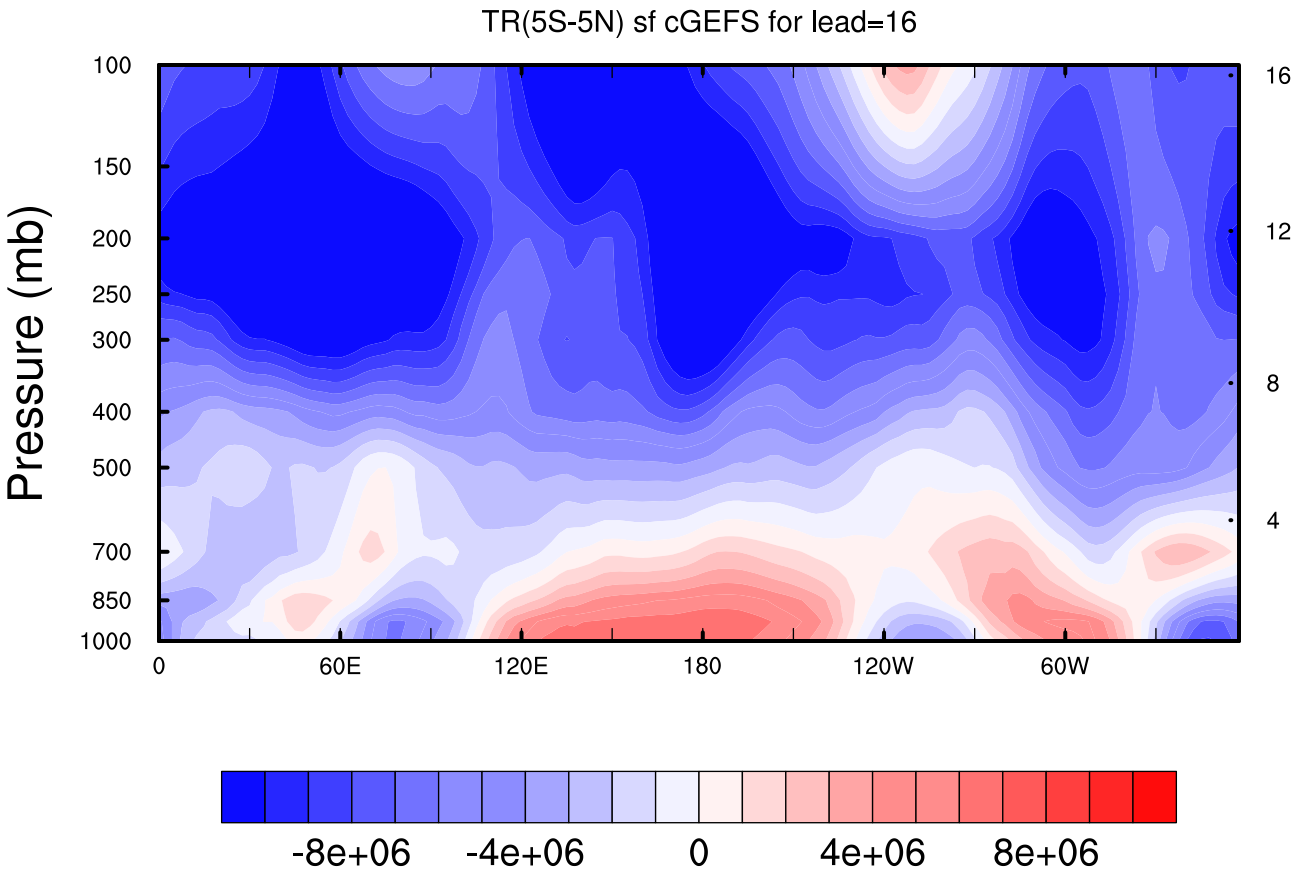
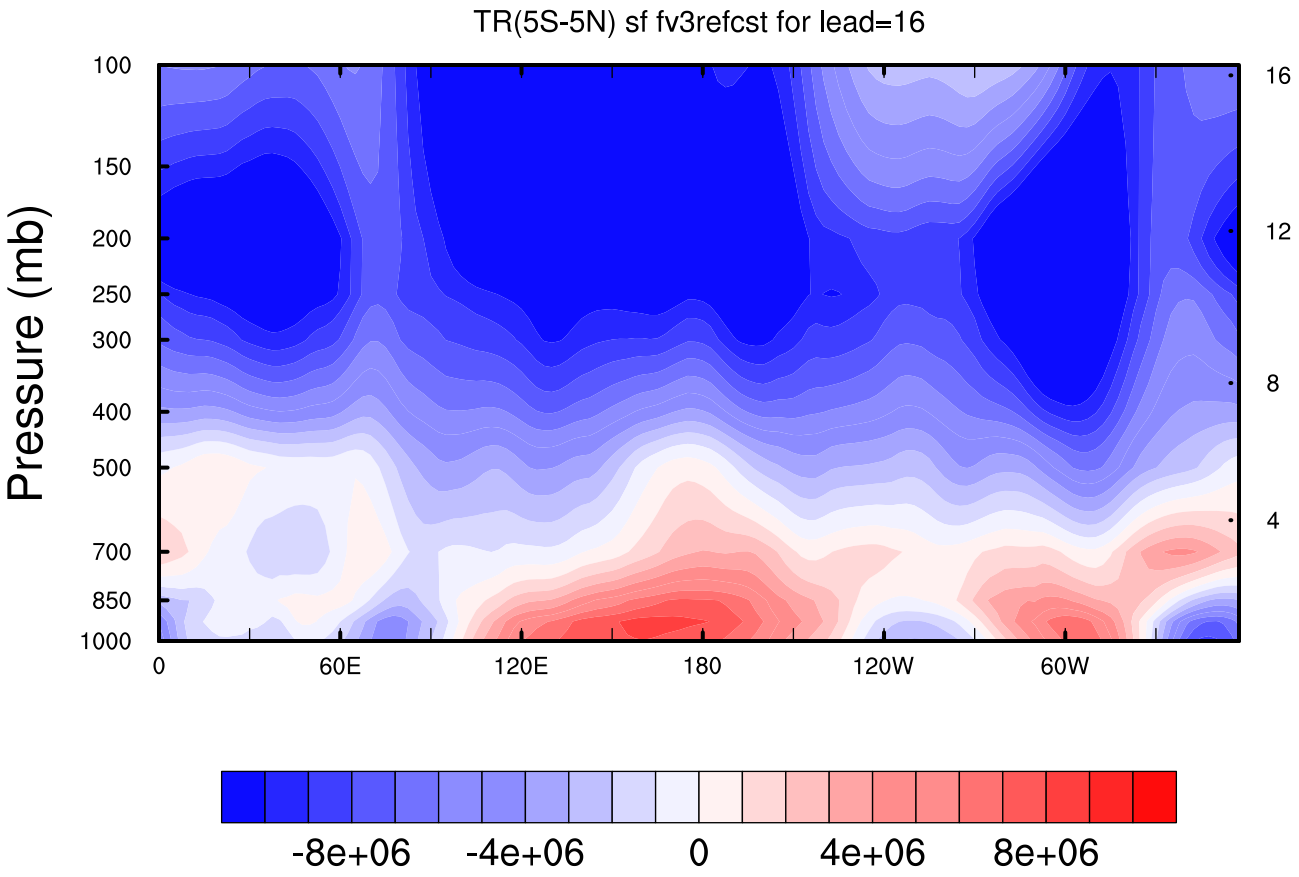
1.6e+07

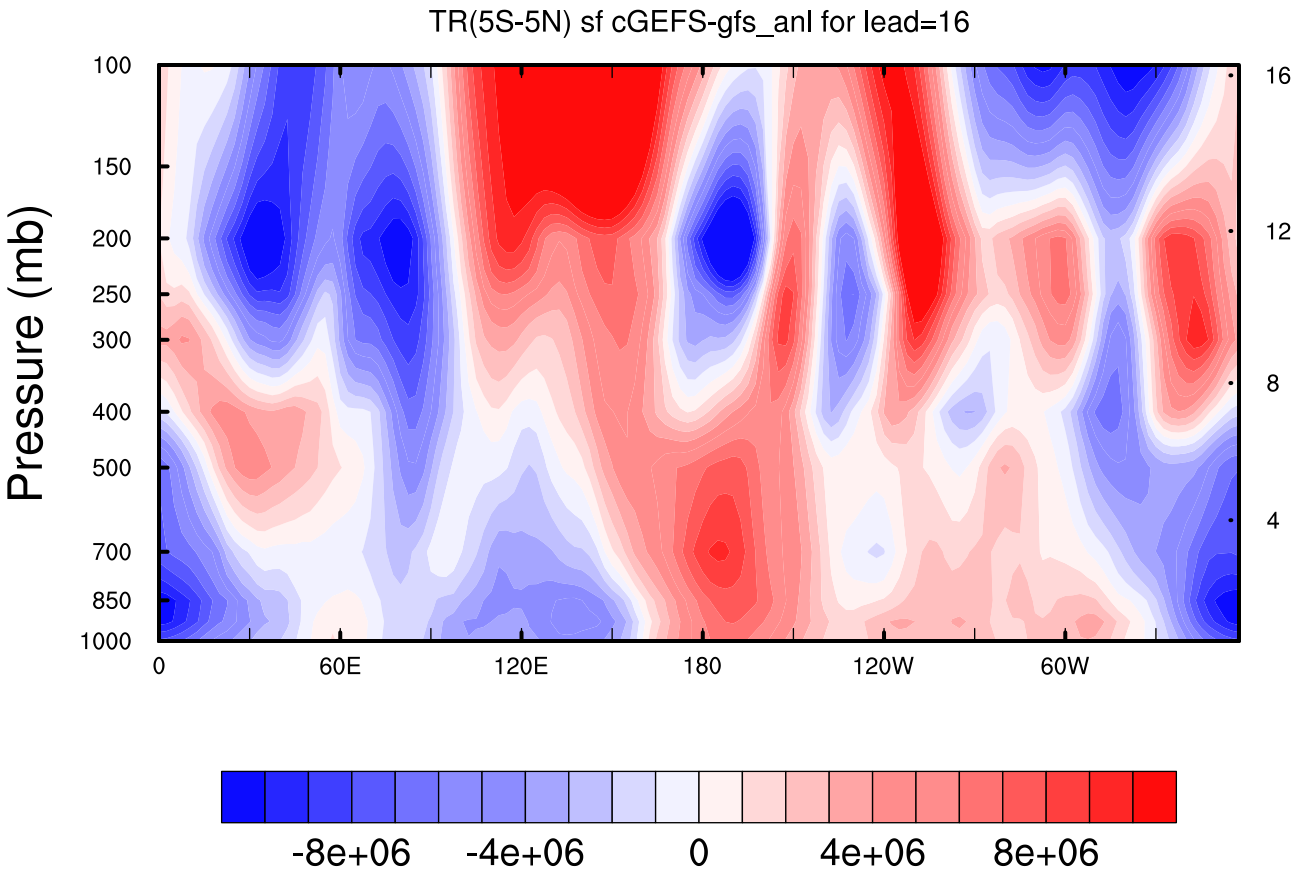

vp 200hPa cGEFS-gfs_anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

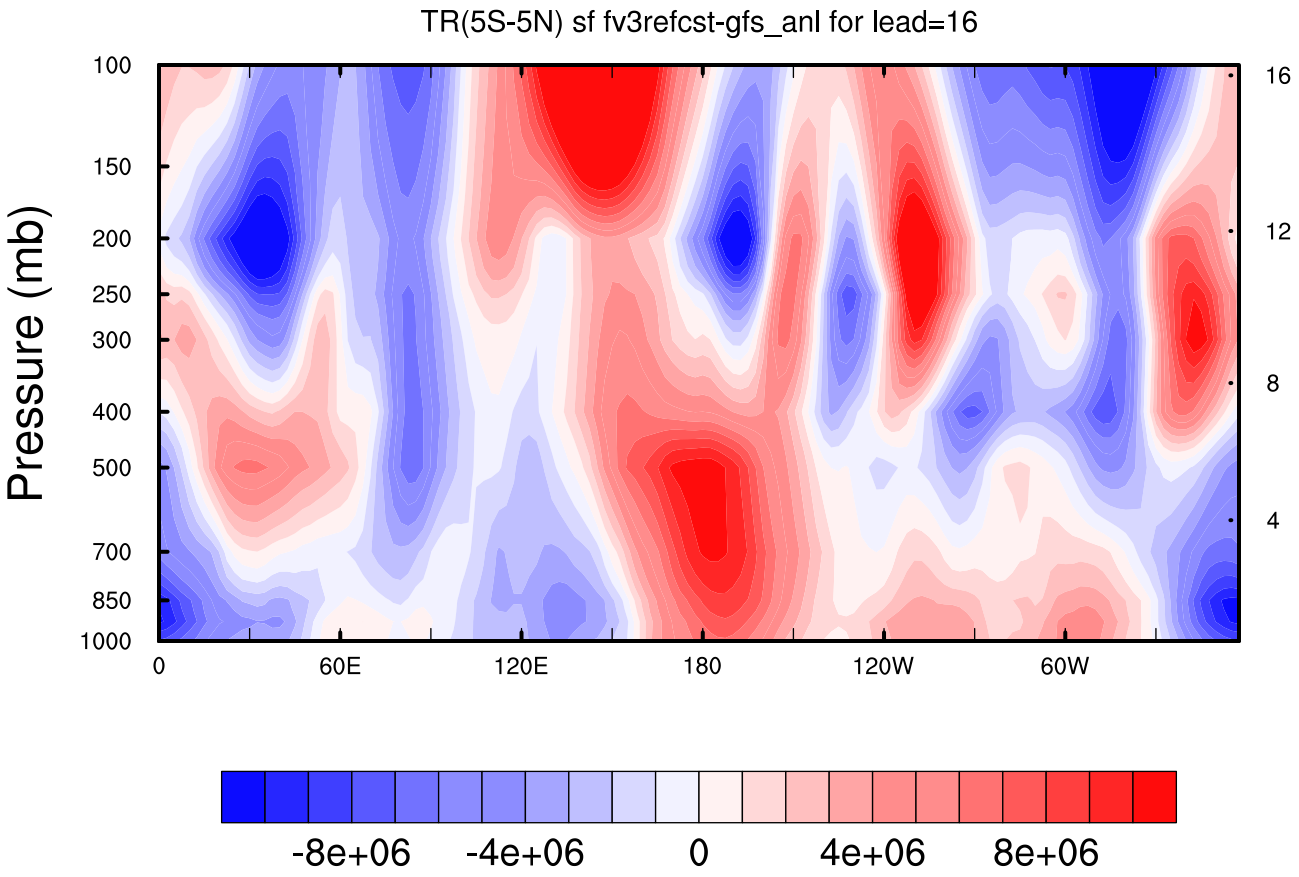

vp 200hPa fv3refcst-gfs_anl for lead=16
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

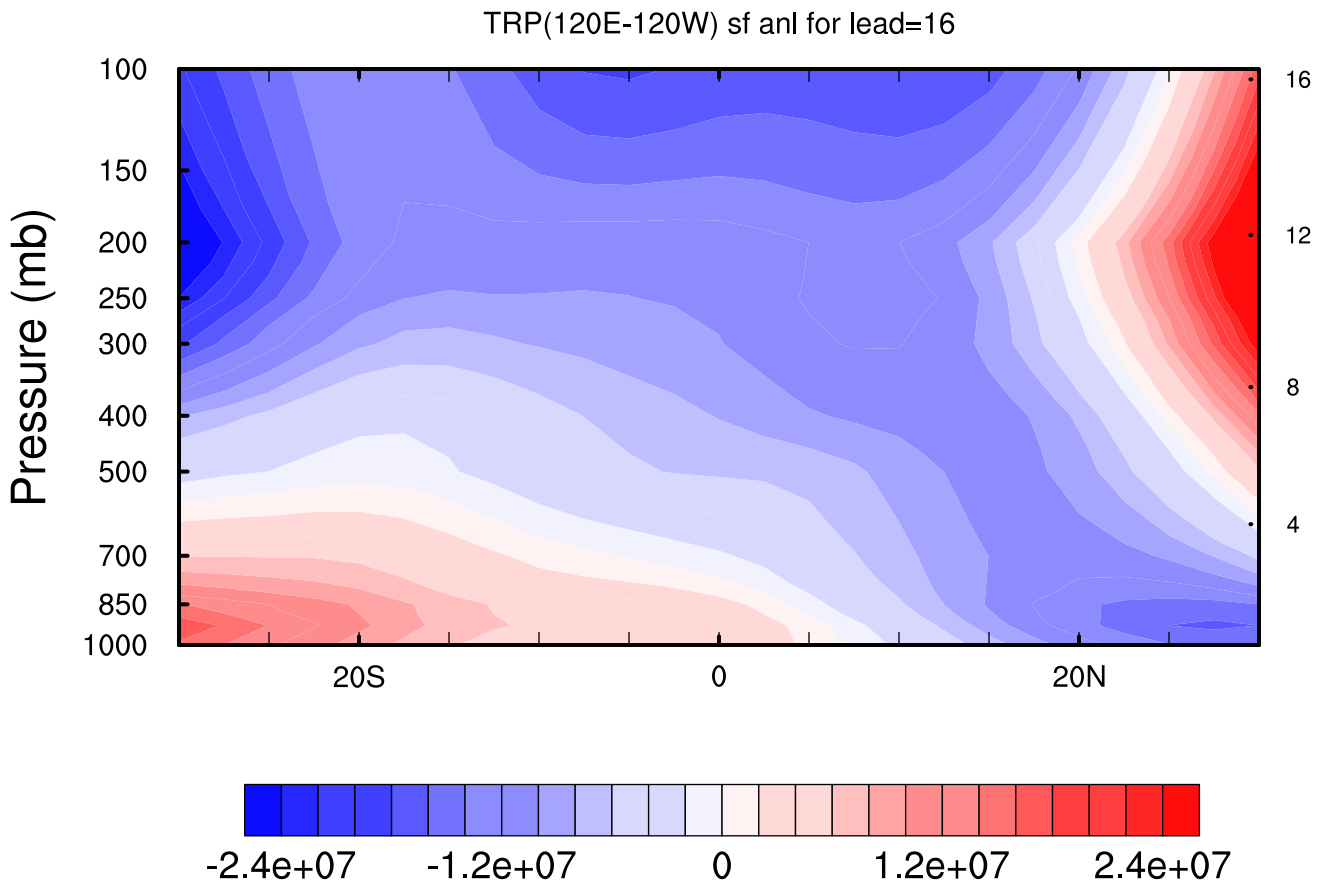

TR(5S-5N) sf anl for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

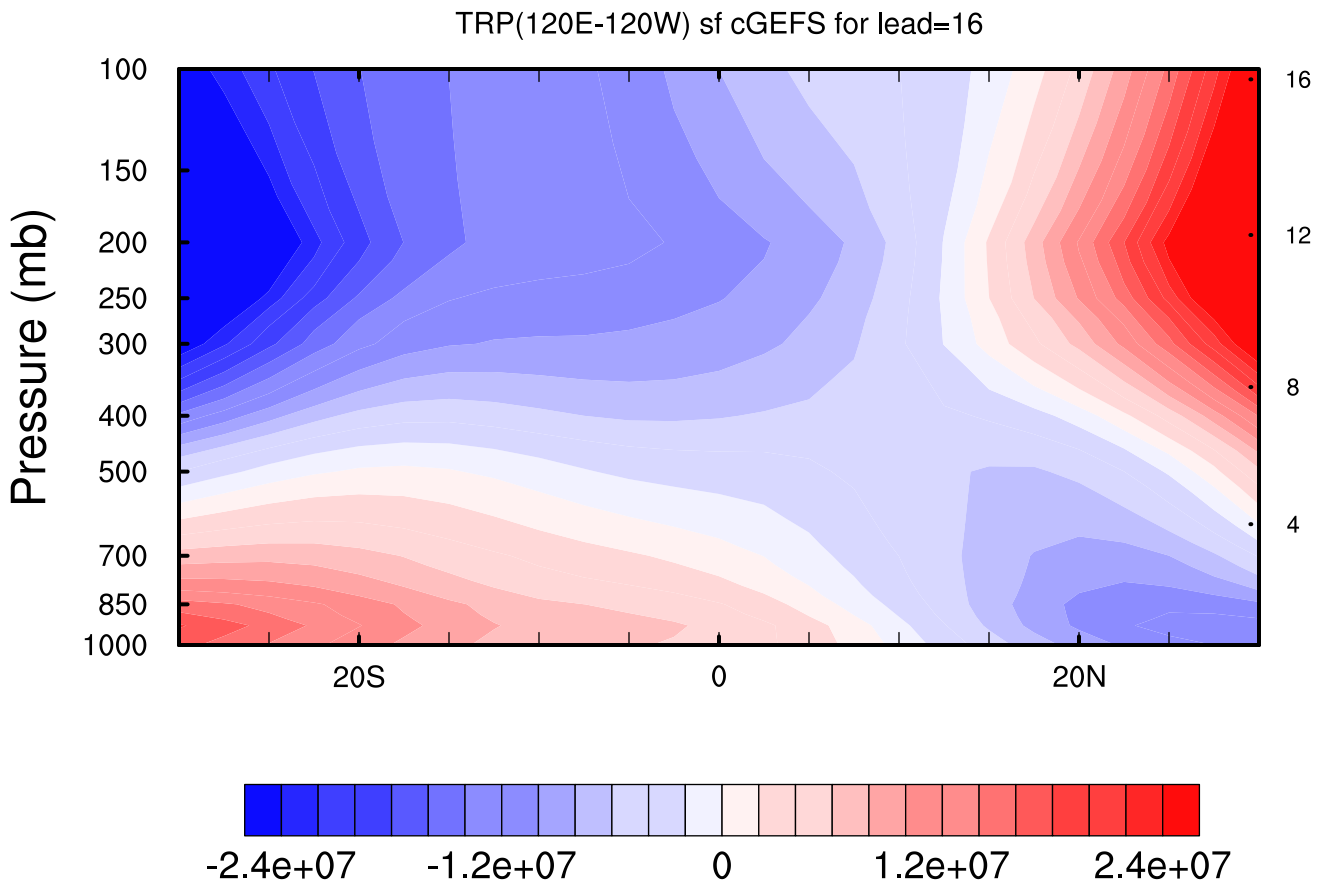

TR(5S-5N) sf cGEFS for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

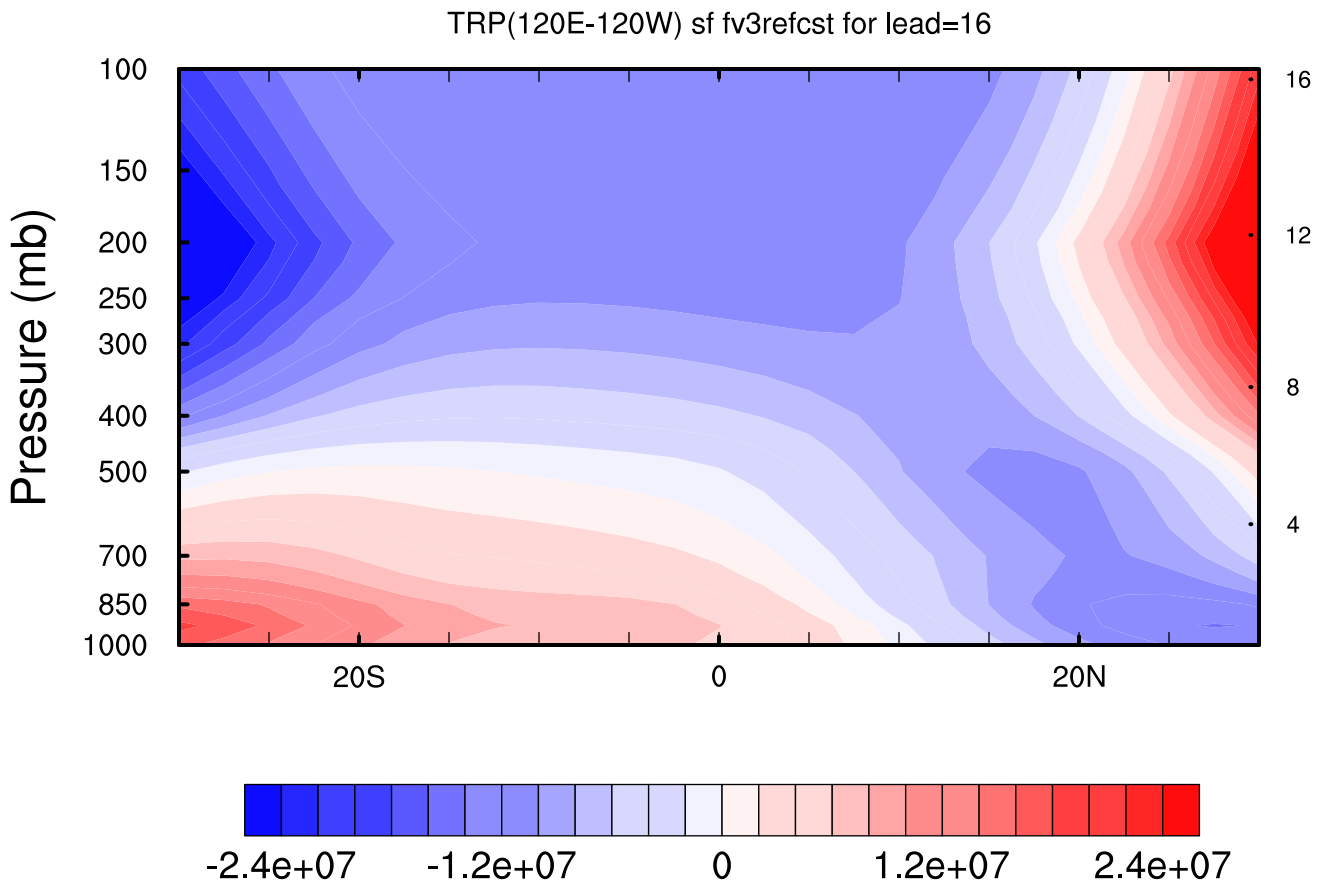

TR(5S-5N) sf fv3refcst for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

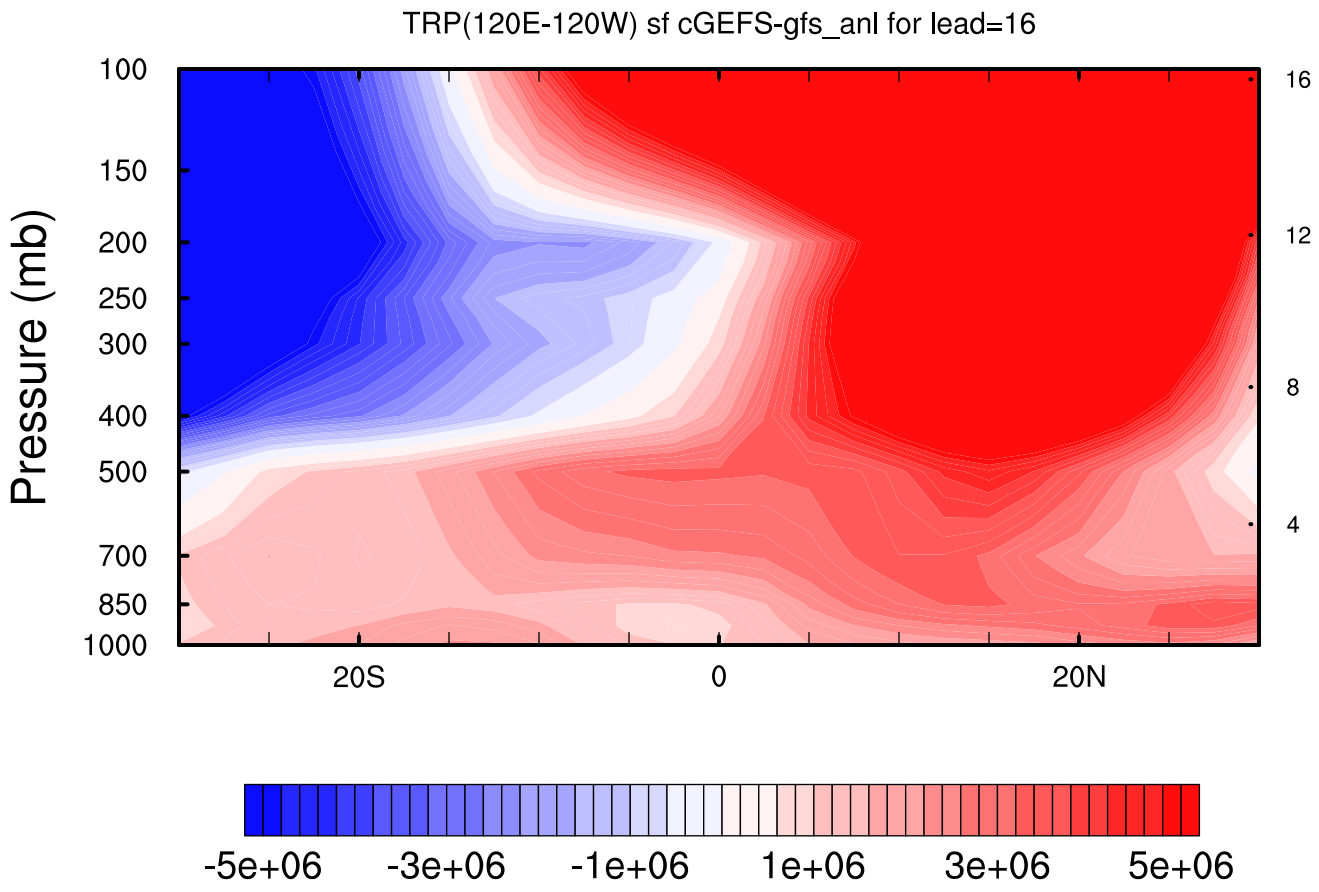

TR(5S-5N) sf cGEFS-gfs_anl for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

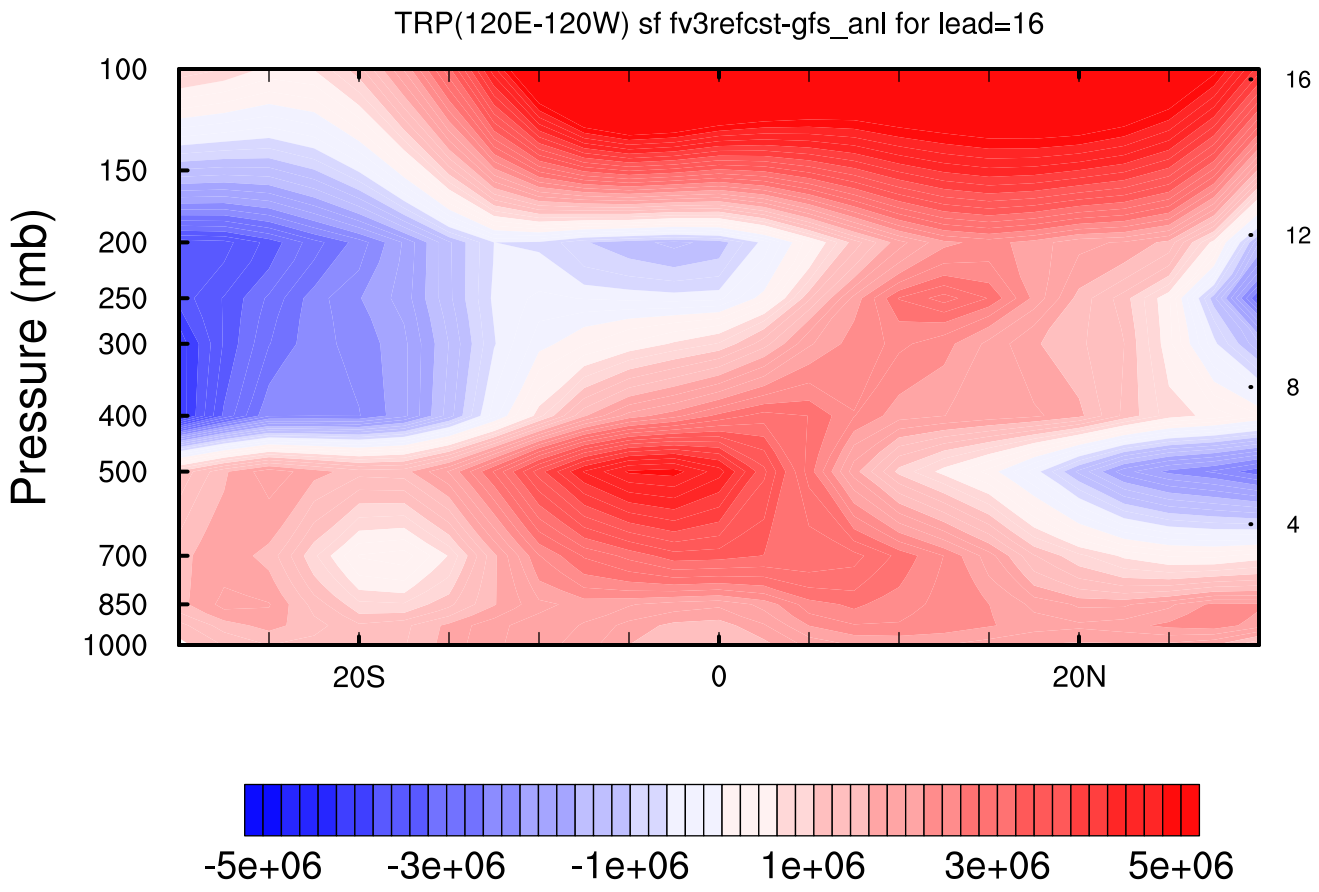

TR(5S-5N) sf fv3refcst-gfs_anl for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

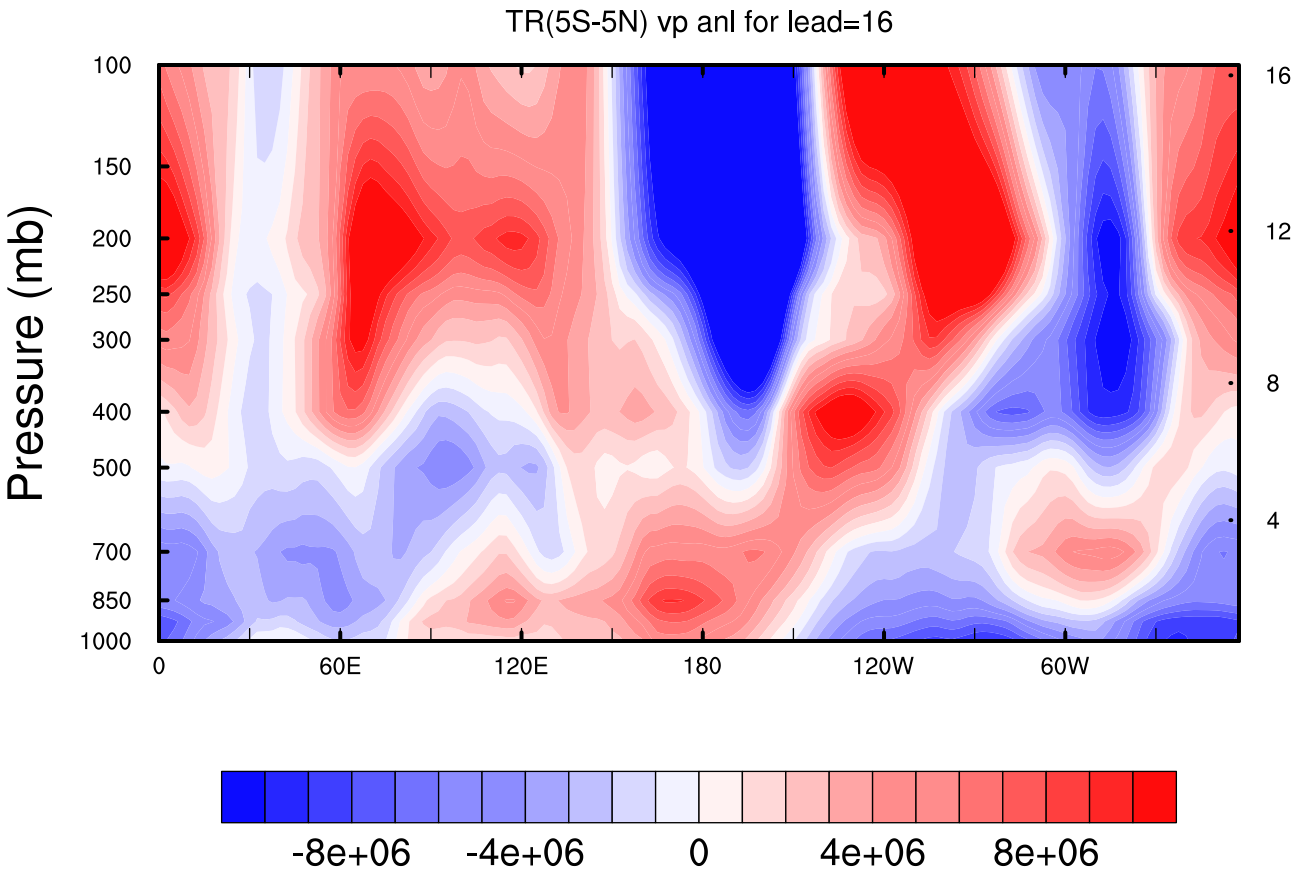

TRP(120E-120W) sf anl for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

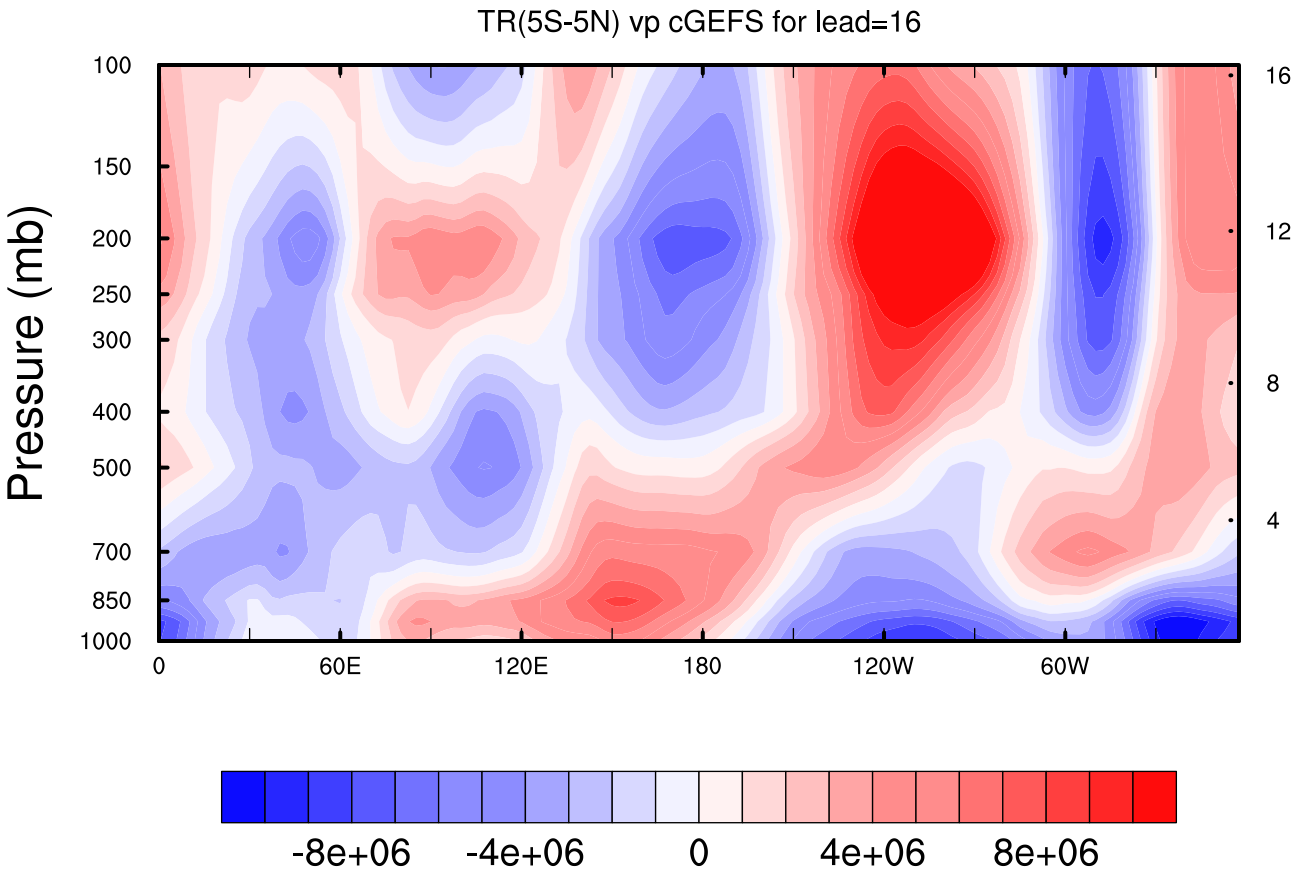

TRP(120E-120W) sf cGEFS for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

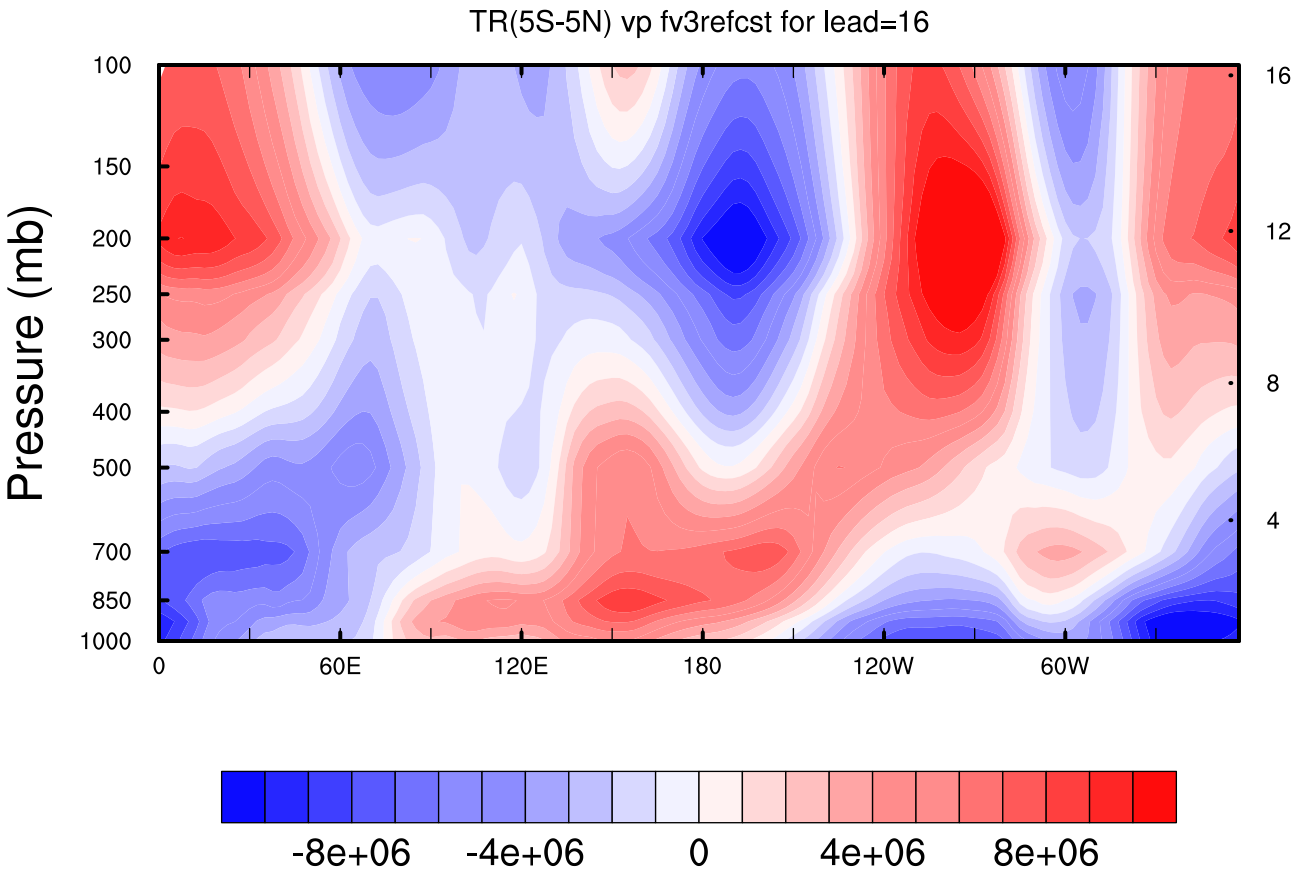

TRP(120E-120W) sf fv3refcst for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

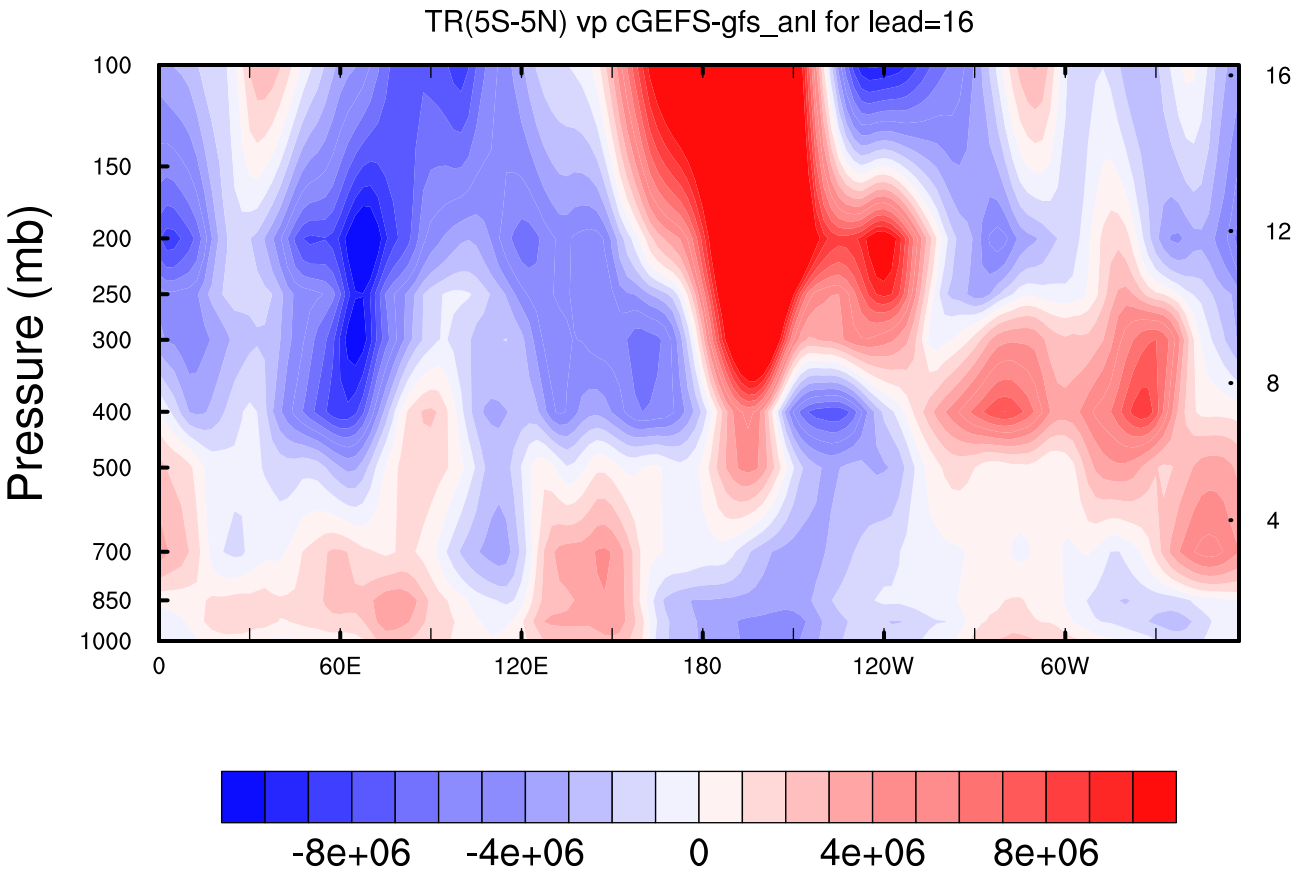

TRP(120E-120W) sf cGEFS-gfs_anl for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

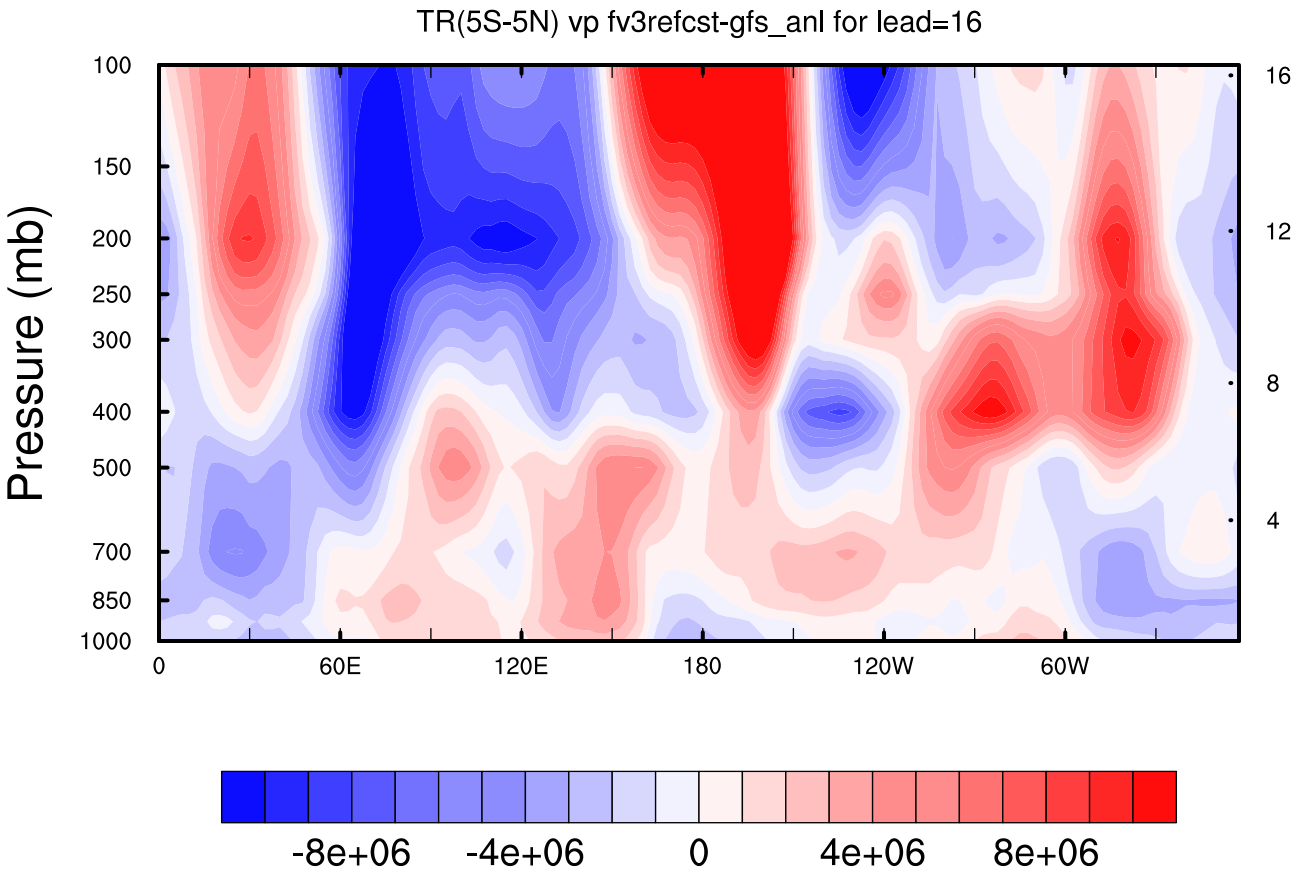

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

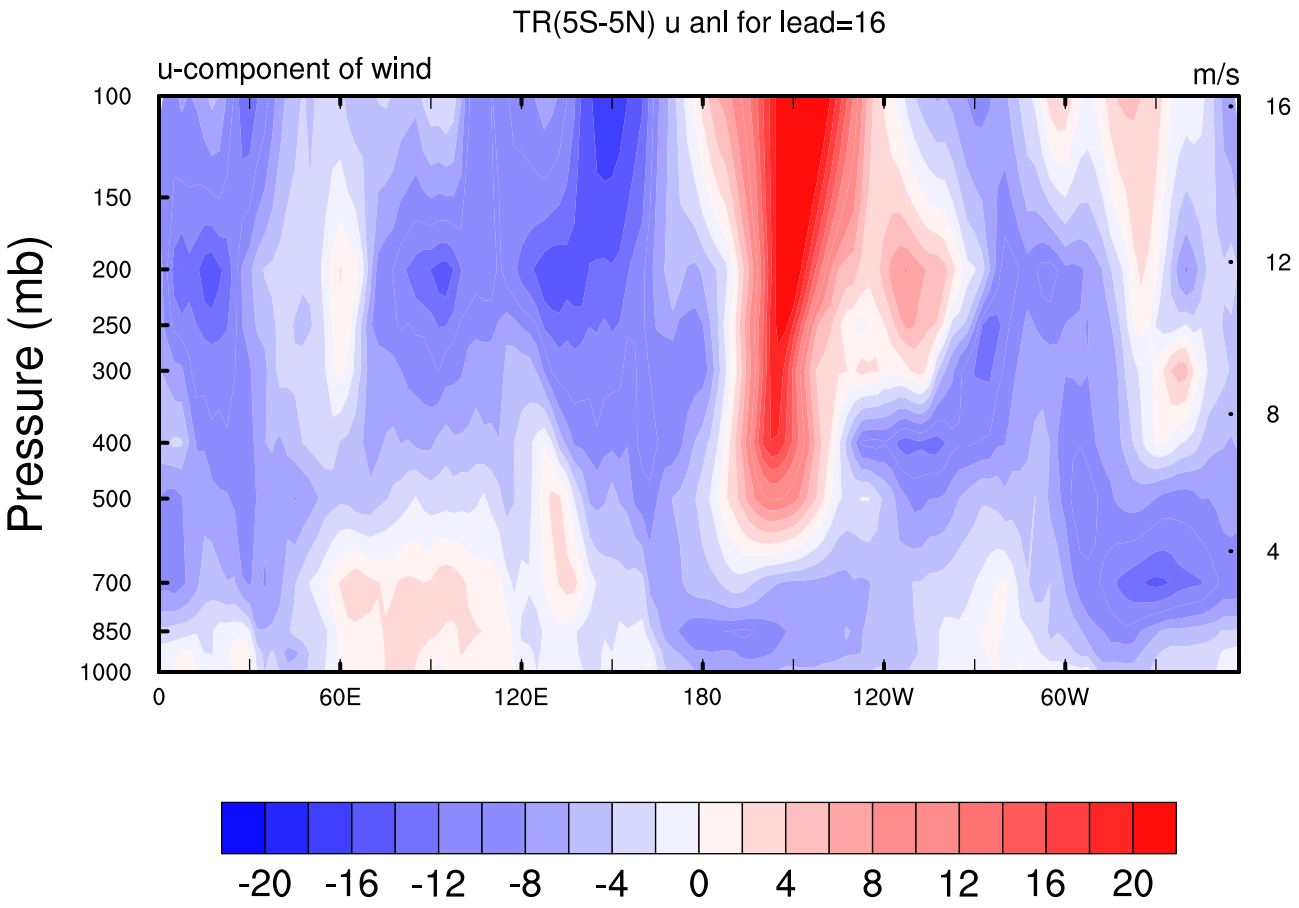

TR(5S-5N) vp anl for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

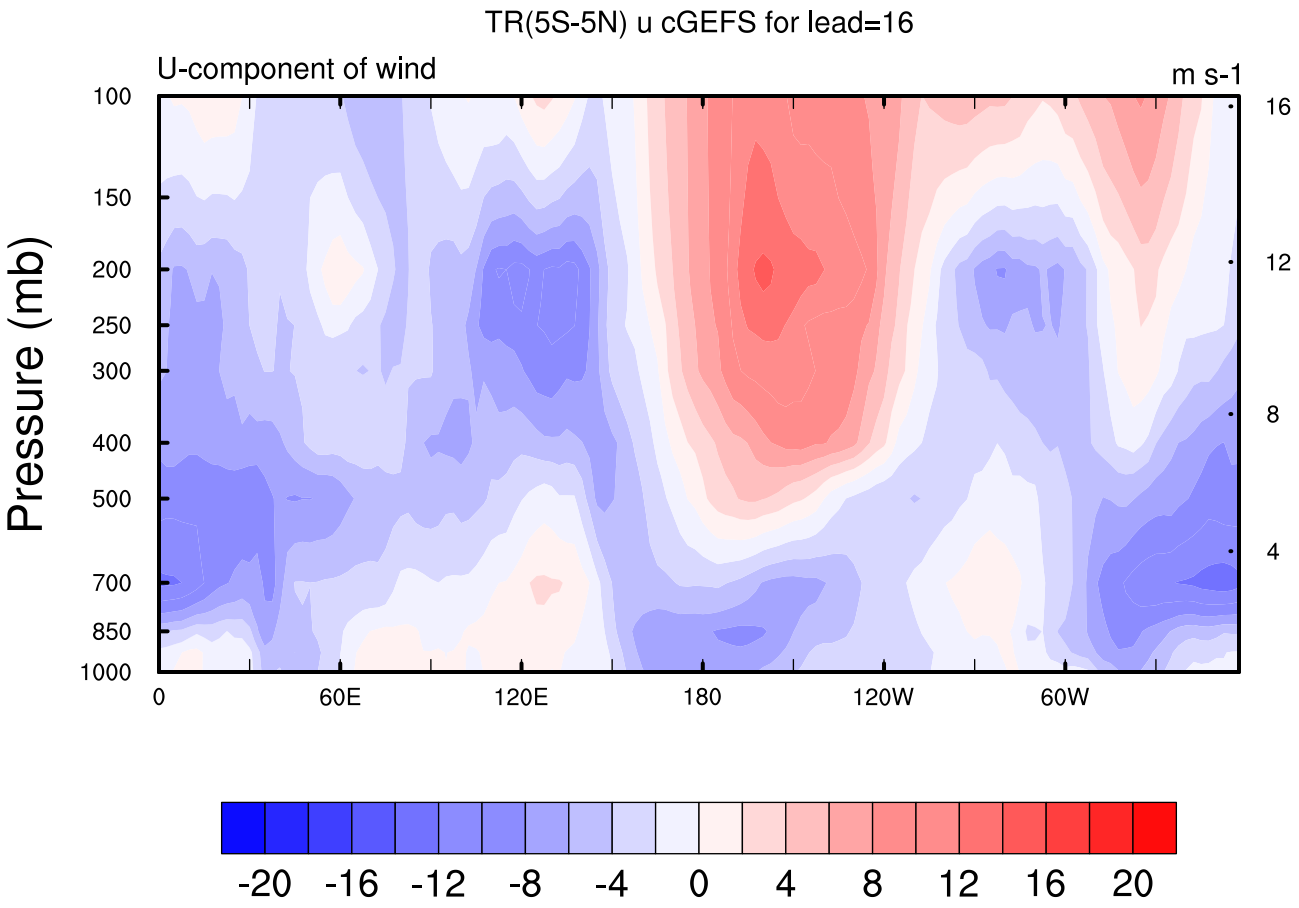

TR(5S-5N) vp cGEFS for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

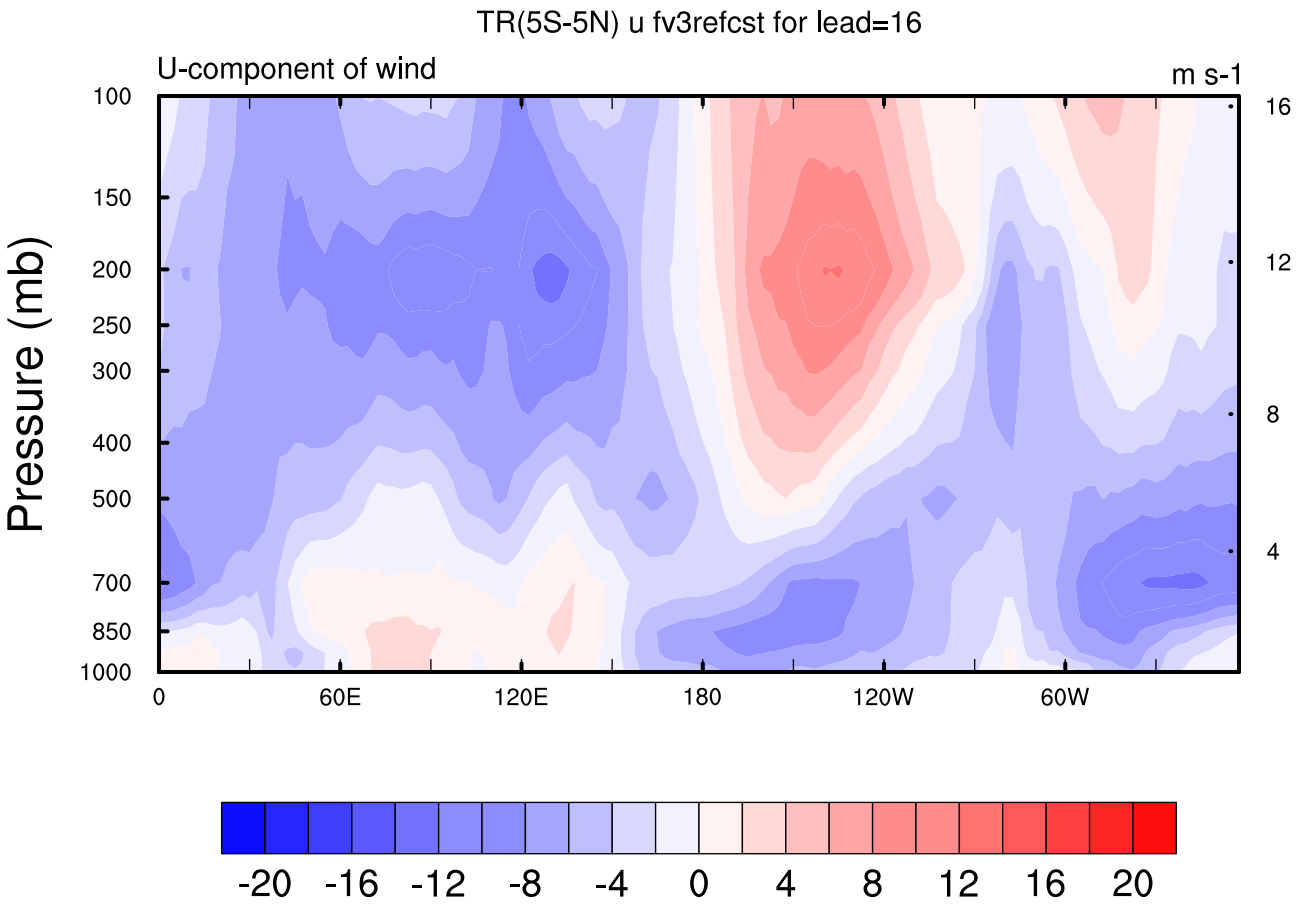

TR(5S-5N) vp fv3refcst for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

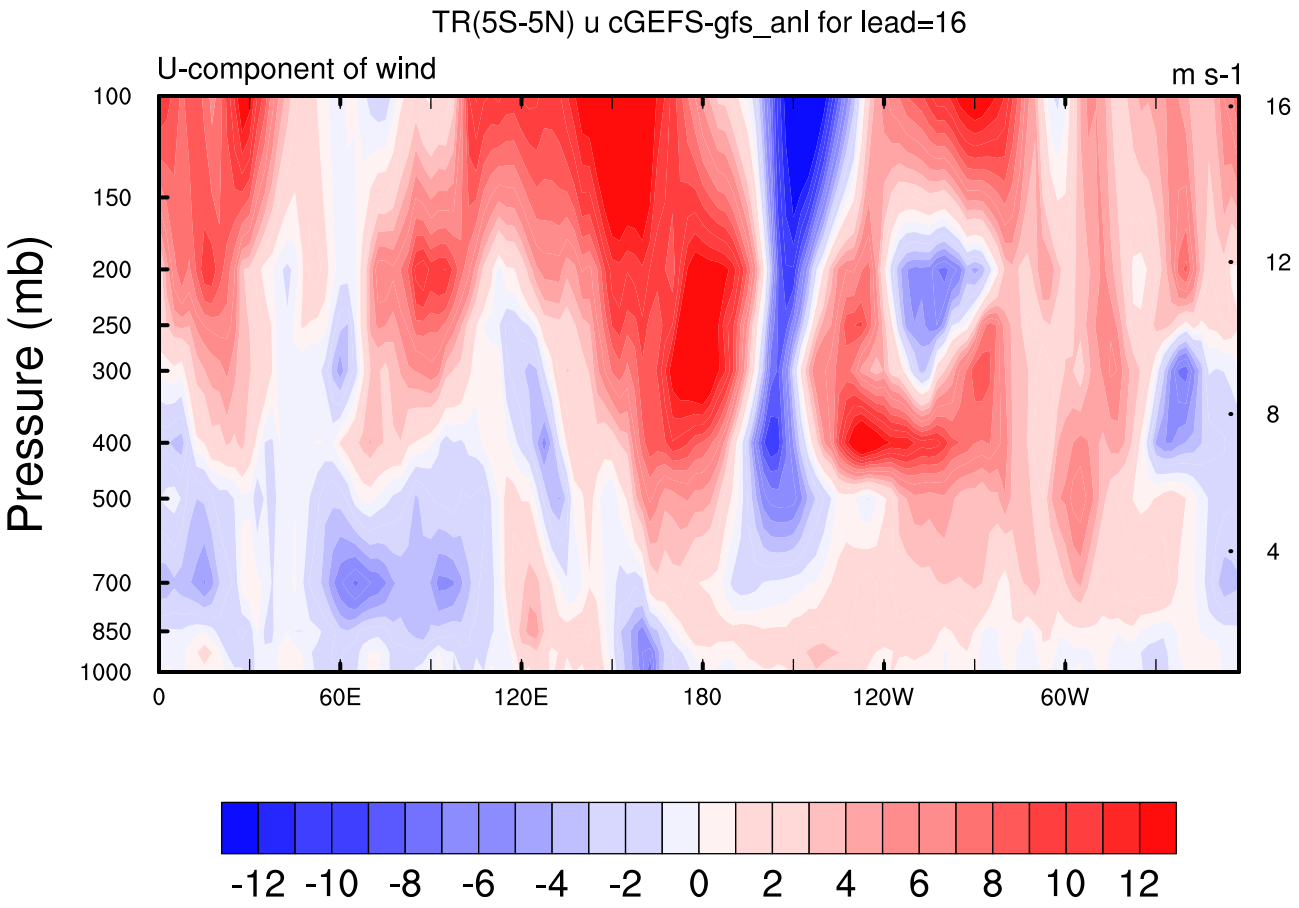

TR(5S-5N) vp cGEFS-gfs_anl for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

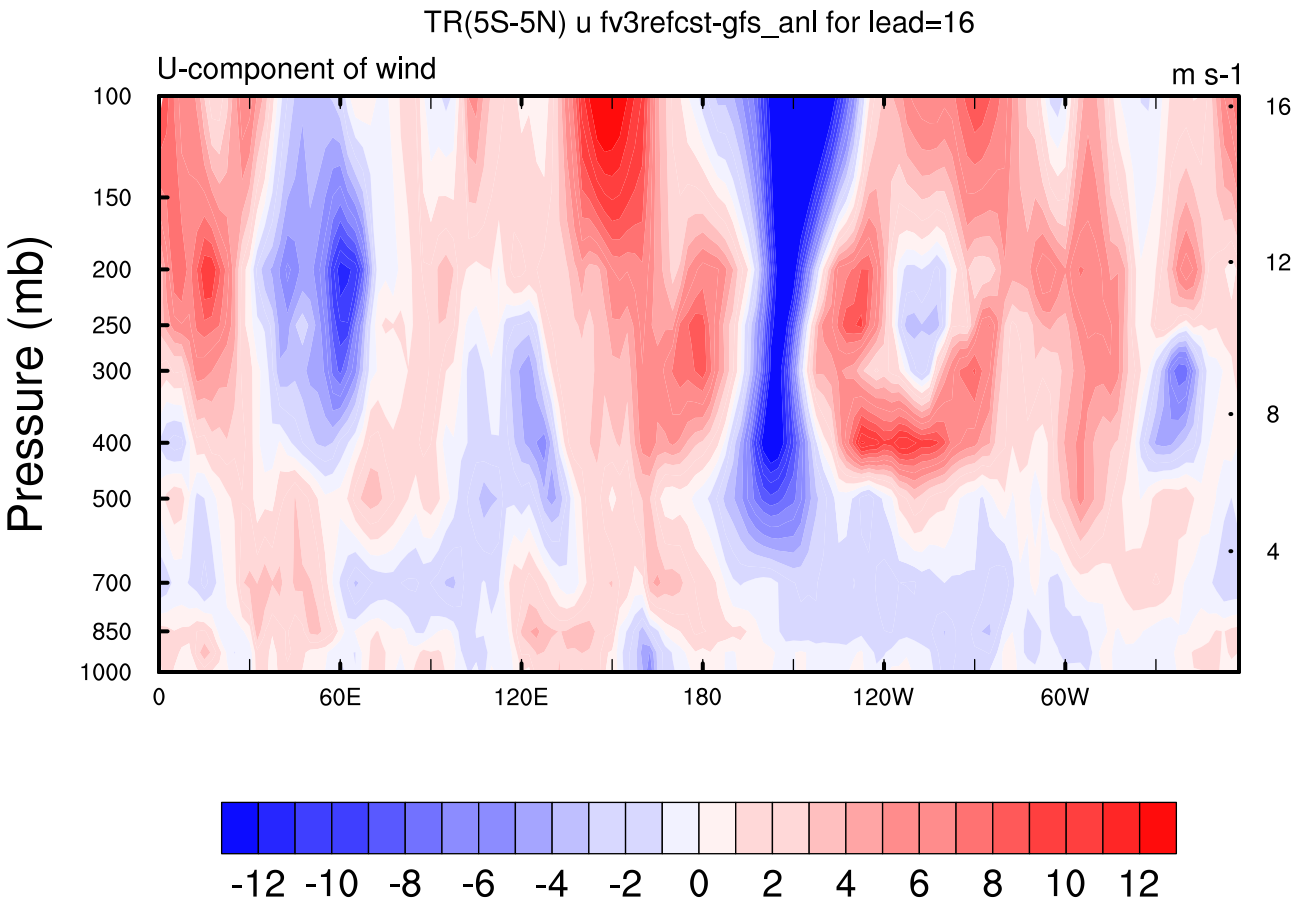

TR(5S-5N) vp fv3refcst-gfs_anl for lead=16
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

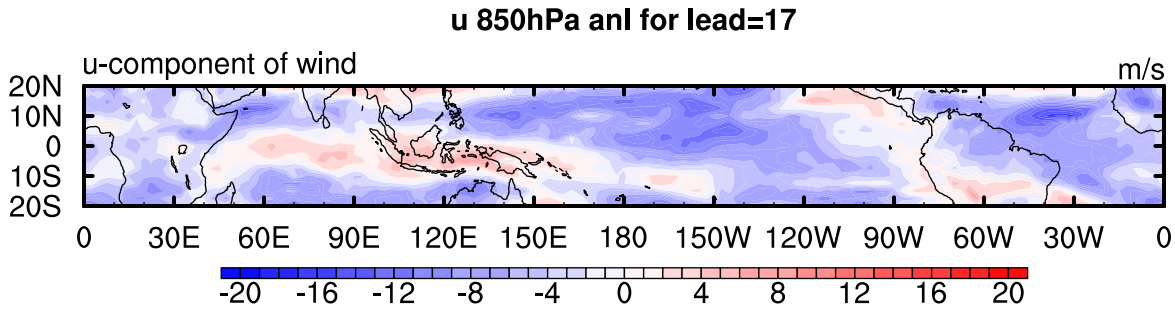

TR(5S-5N) u anl for lead=16
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

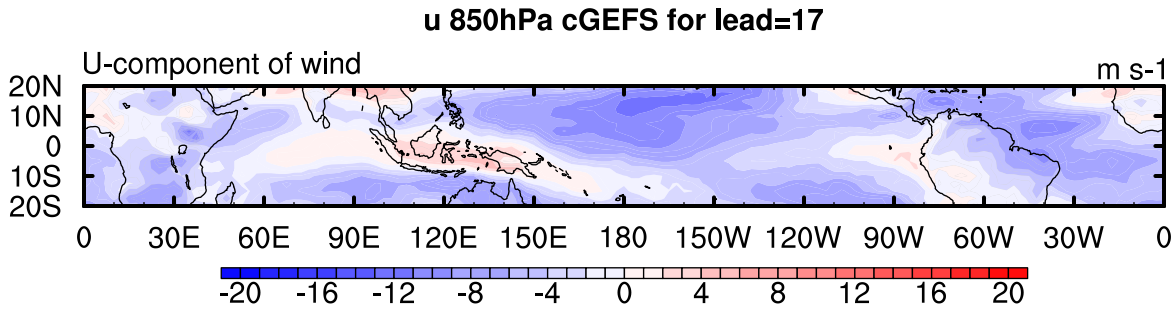

TR(5S-5N) u cGEFS for lead=16
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

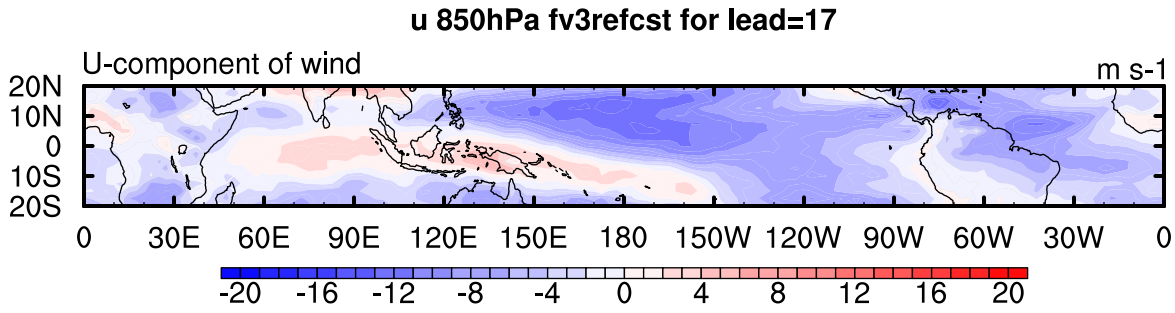

TR(5S-5N) u fv3refcst for lead=16
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

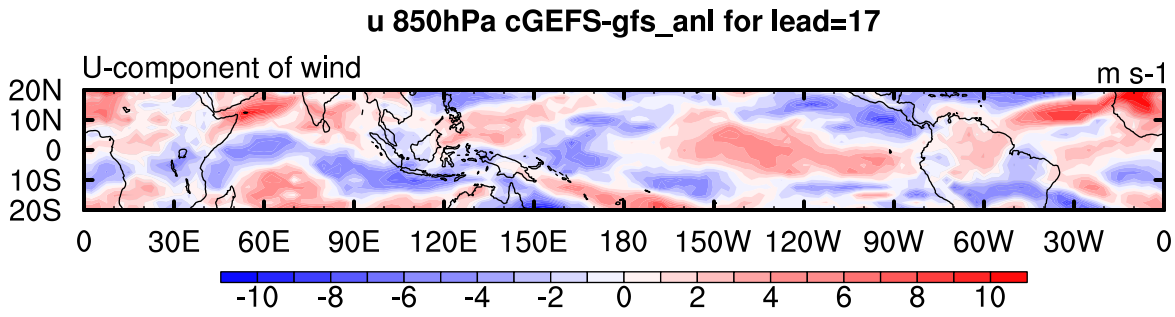

TR(5S-5N) u cGEFS-gfs_anl for lead=16
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

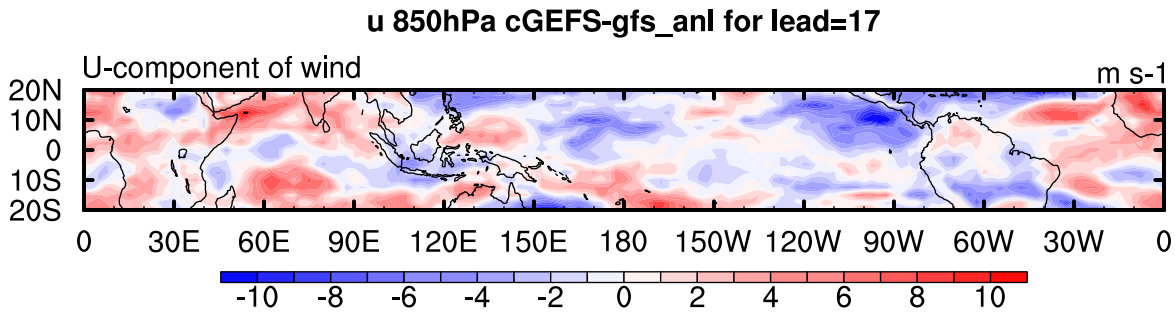

TR(5S-5N) u fv3refcst-gfs_anl for lead=16
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

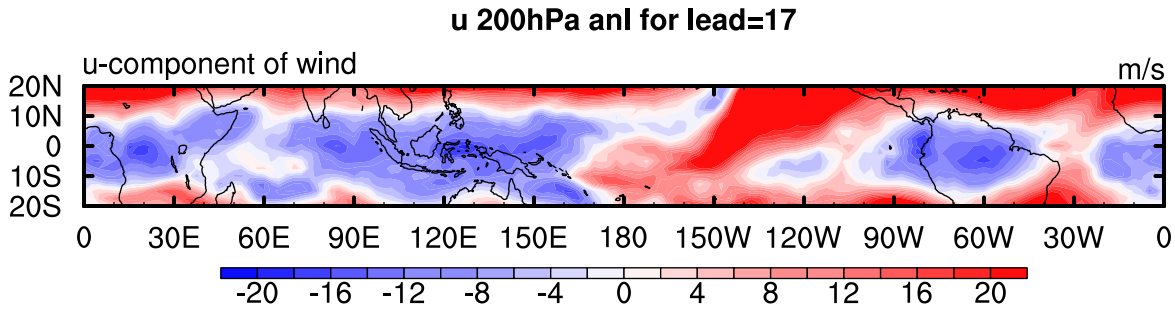

u 850hPa anl for lead=17
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

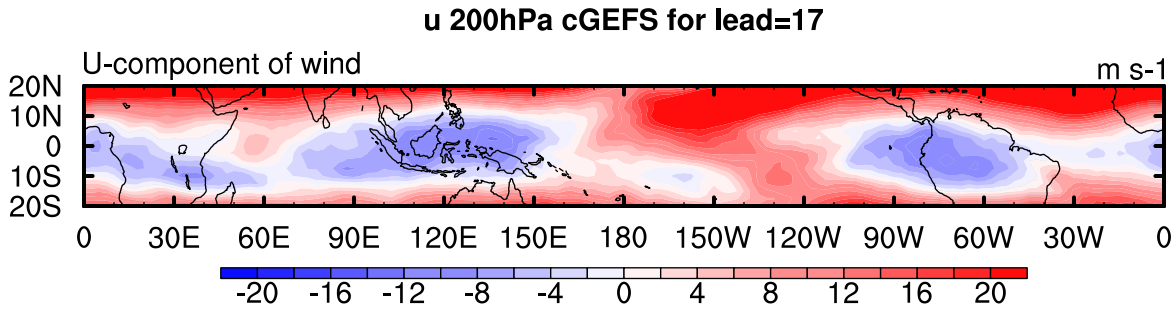

u 850hPa cGEFS for lead=17
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

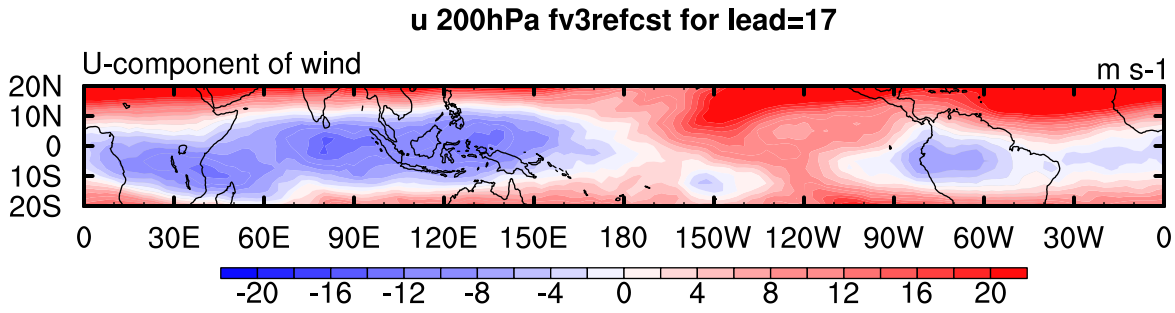

u 850hPa fv3refcst for lead=17
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

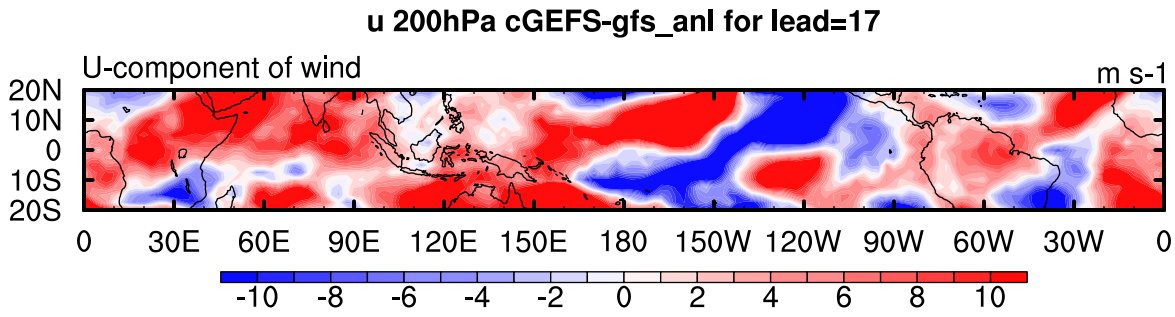

u 850hPa cGEFS-gfs_anl for lead=17
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

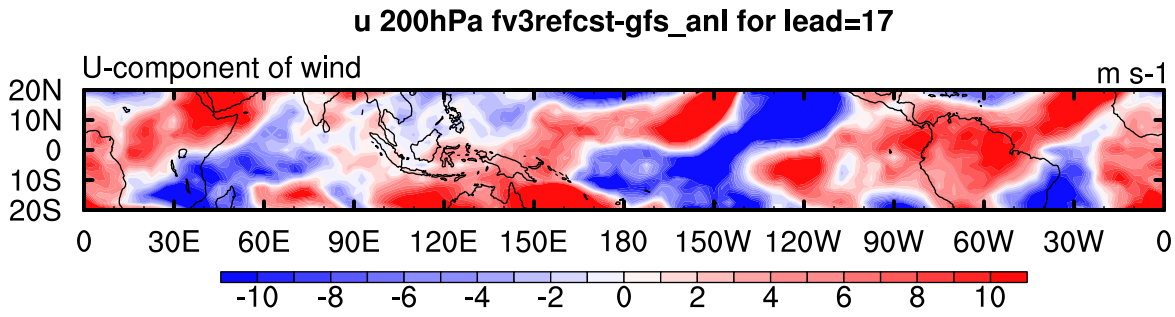

u 850hPa cGEFS-gfs_anl for lead=17
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

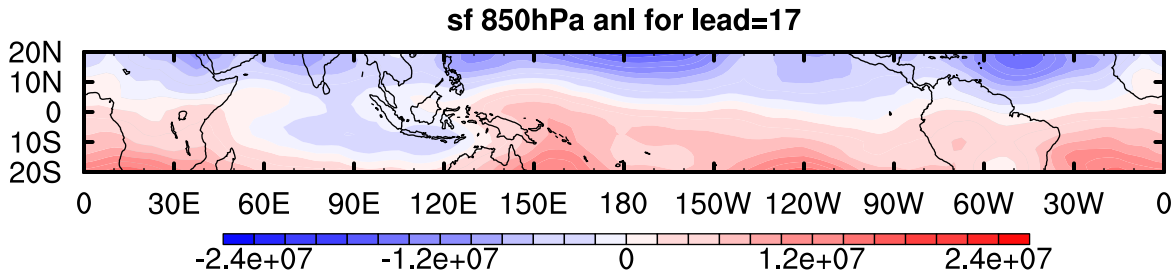

u 200hPa anl for lead=17
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

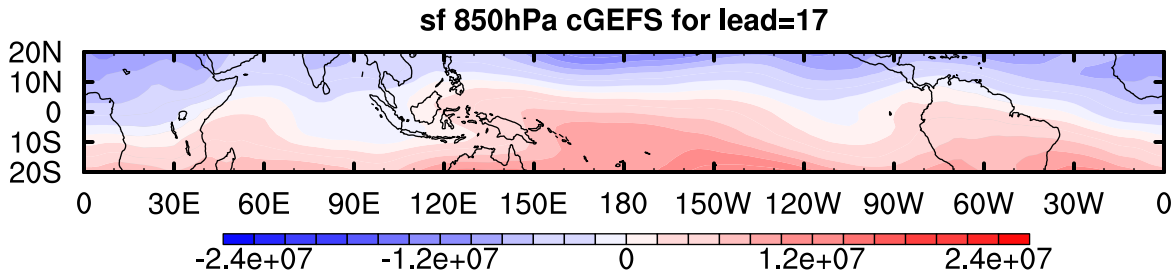

u 200hPa cGEFS for lead=17
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

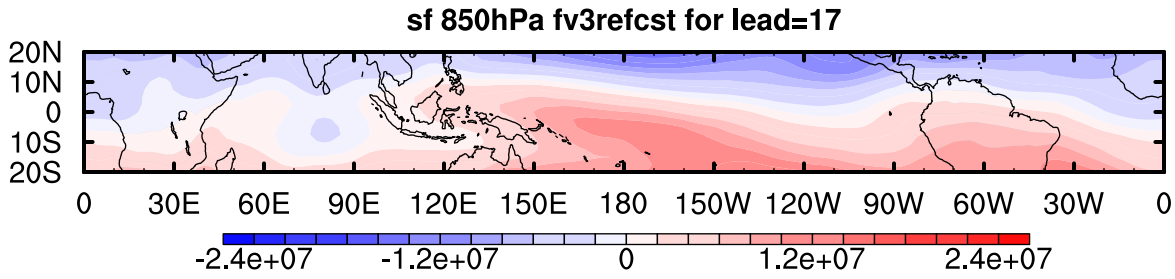

u 200hPa fv3refcst for lead=17
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

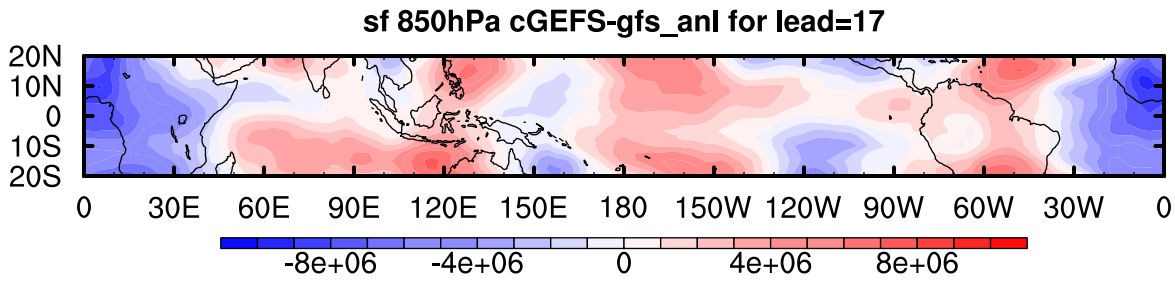

u 200hPa cGEFS-gfs_anl for lead=17
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

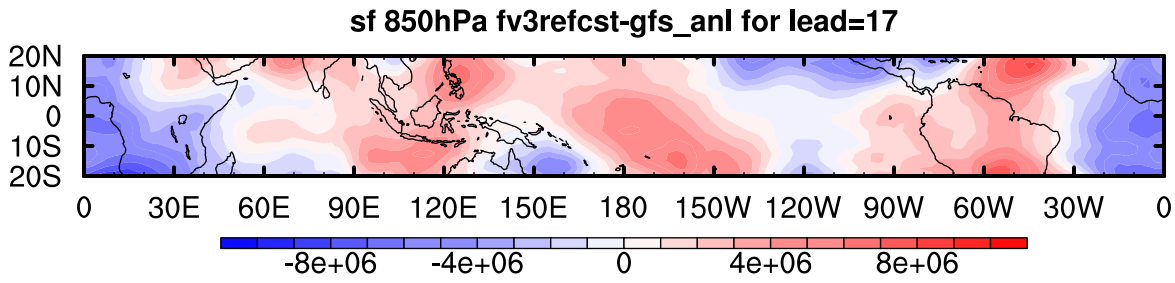

u 200hPa fv3refcst-gfs_anl for lead=17
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


sf 850hPa anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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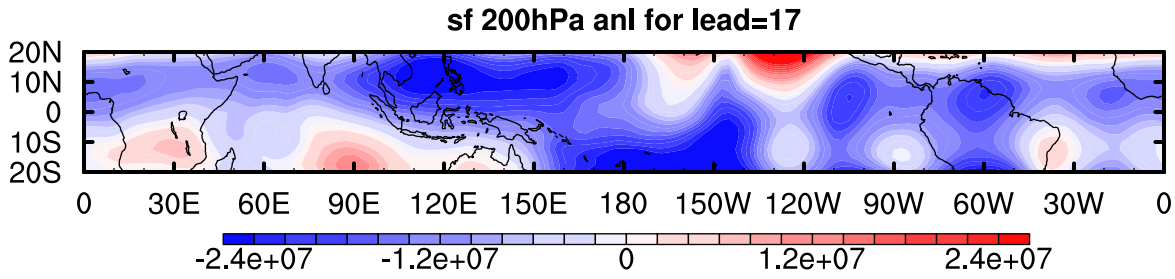
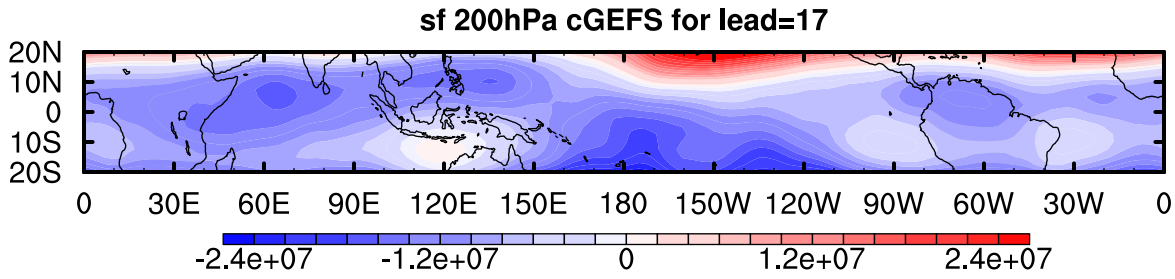
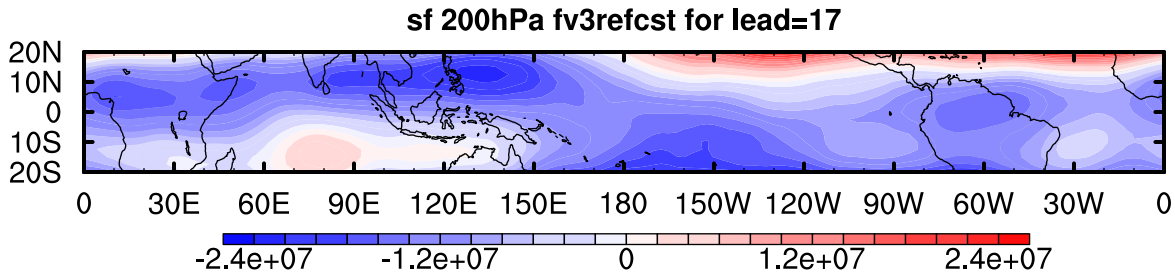
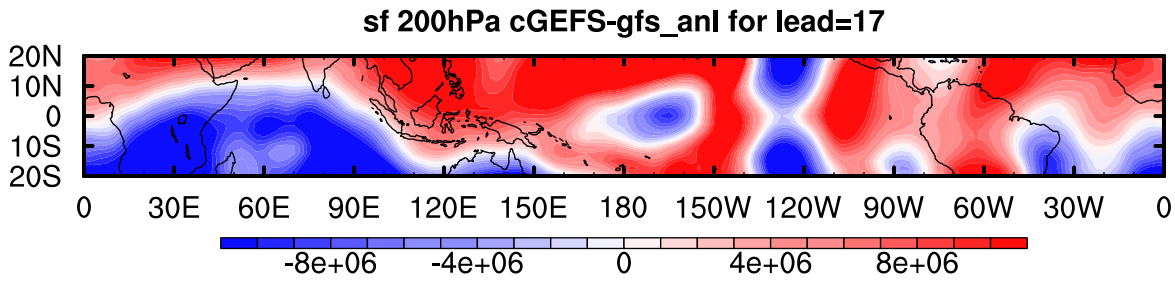
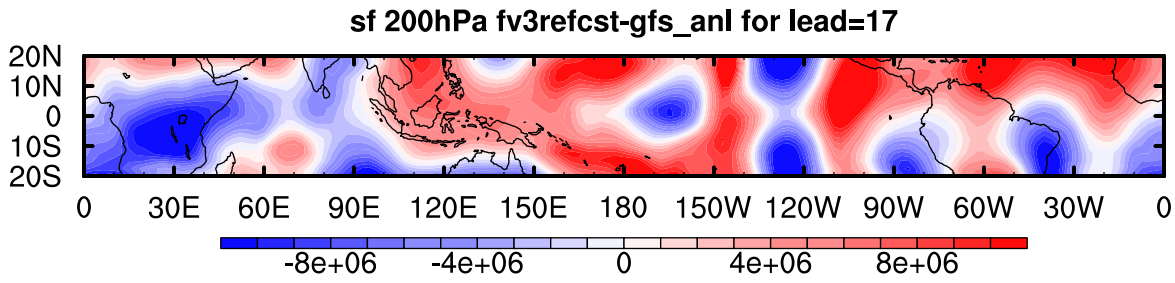
-4e+06
0
4e+06
8e+06

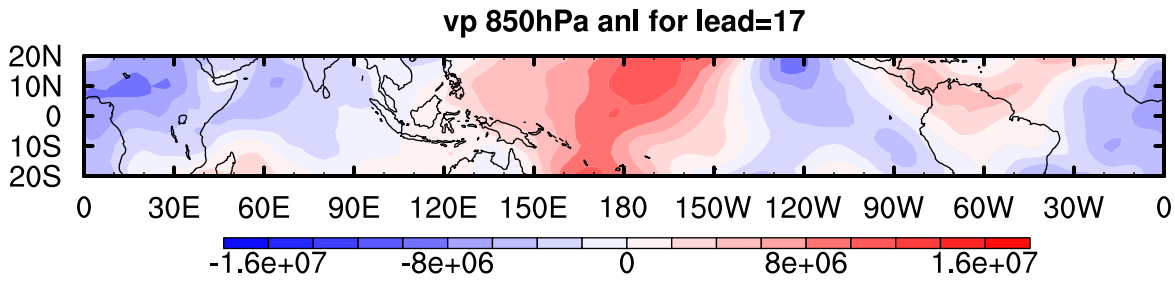

sf 200hPa anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

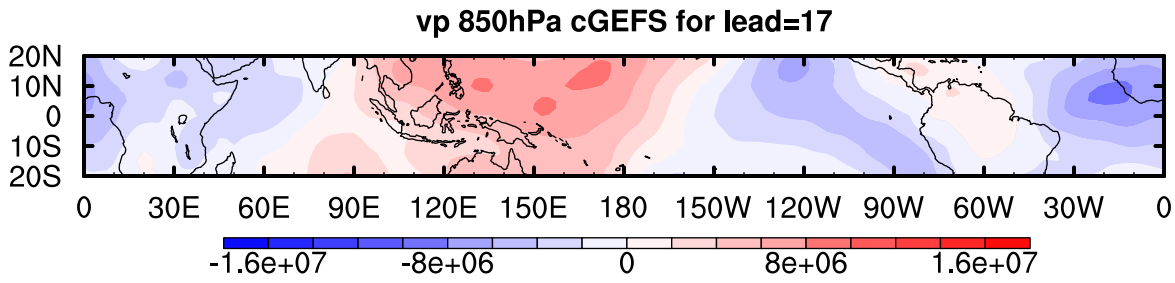

sf 200hPa cGEFS for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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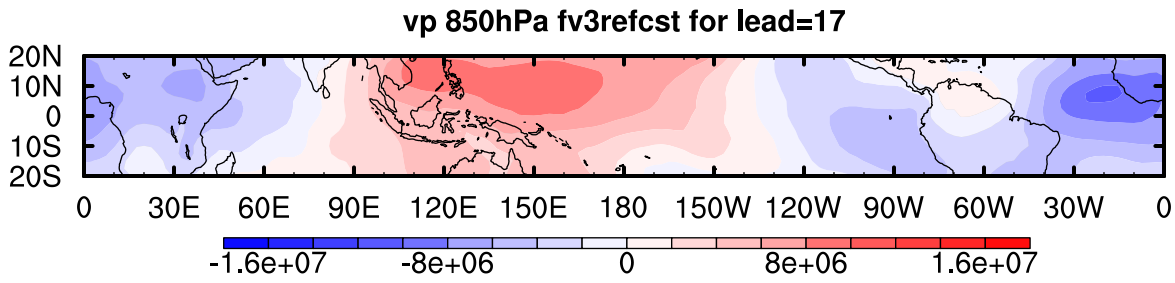
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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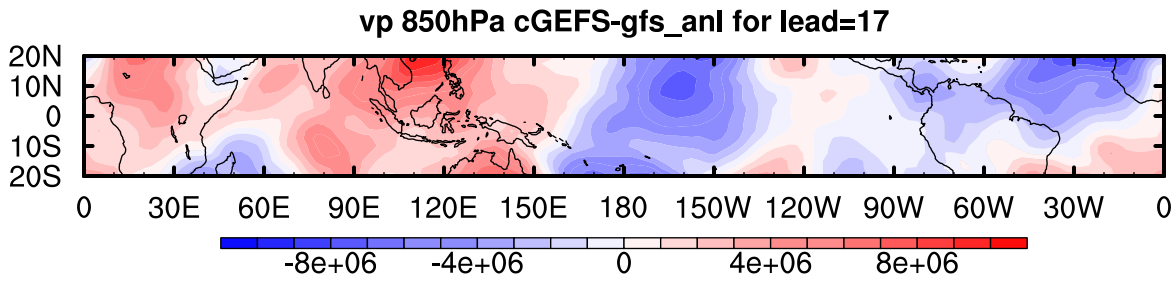
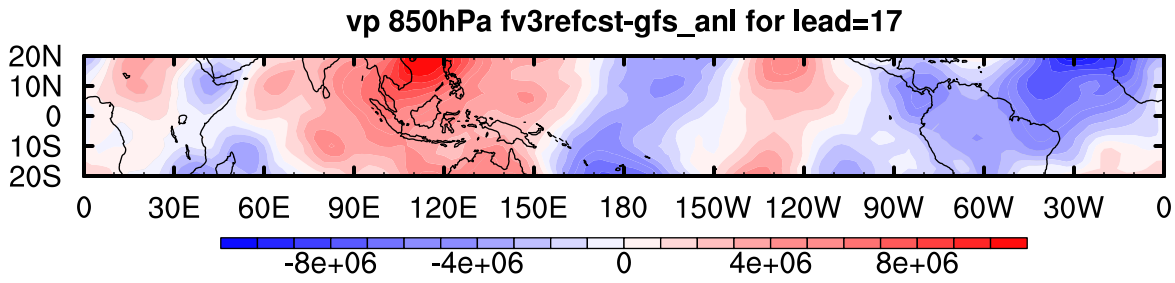
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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-4e+06
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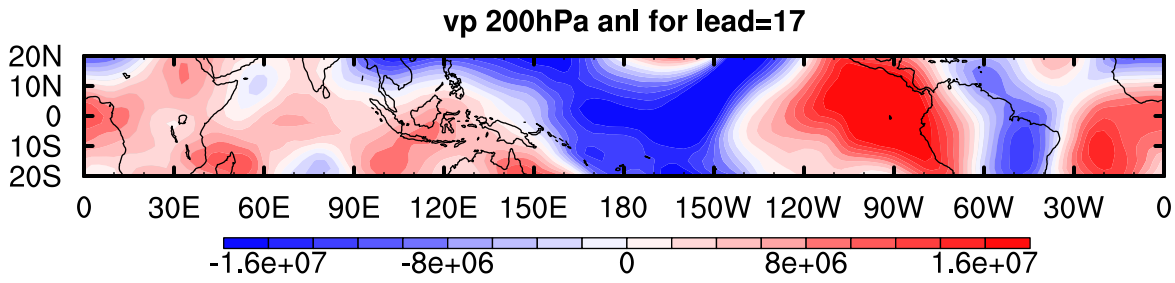
4e+06
8e+06


vp 200hPa anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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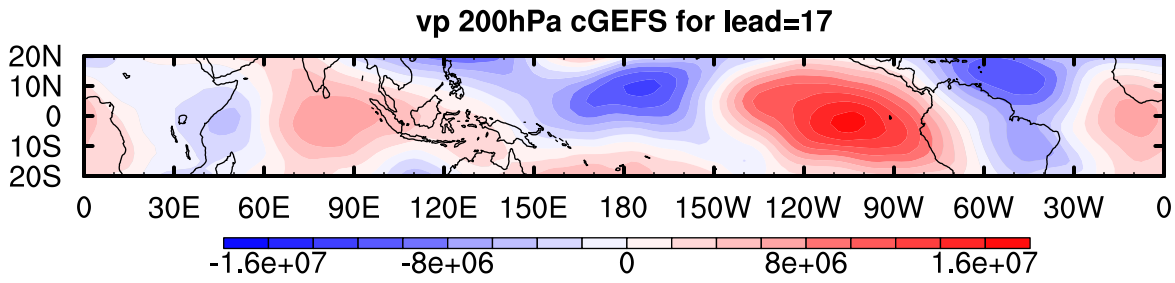
1.6e+07


vp 200hPa cGEFS for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
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-1.6e+07
-8e+06
0
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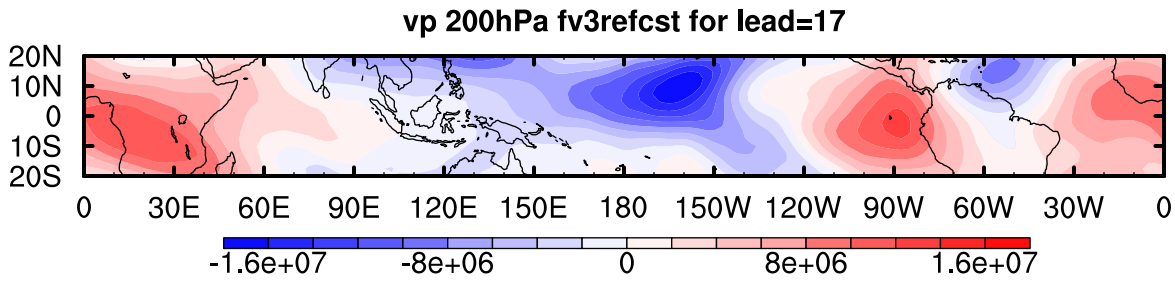
1.6e+07


vp 200hPa fv3refcst for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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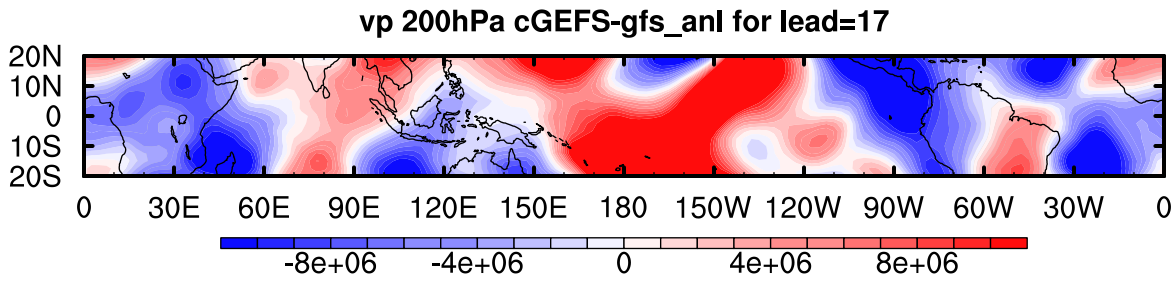
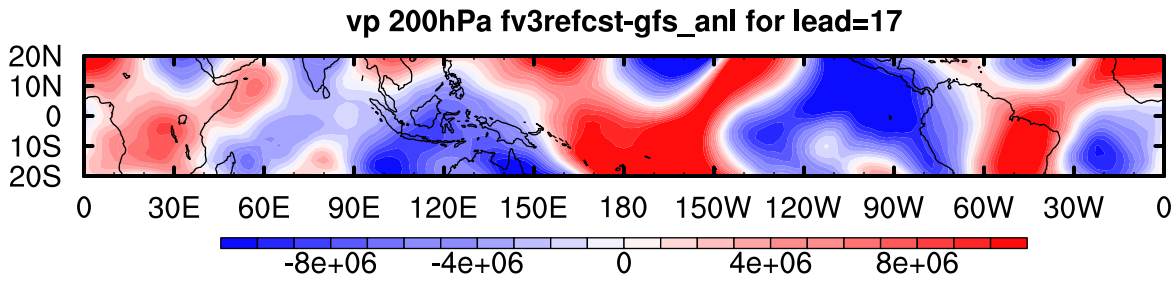
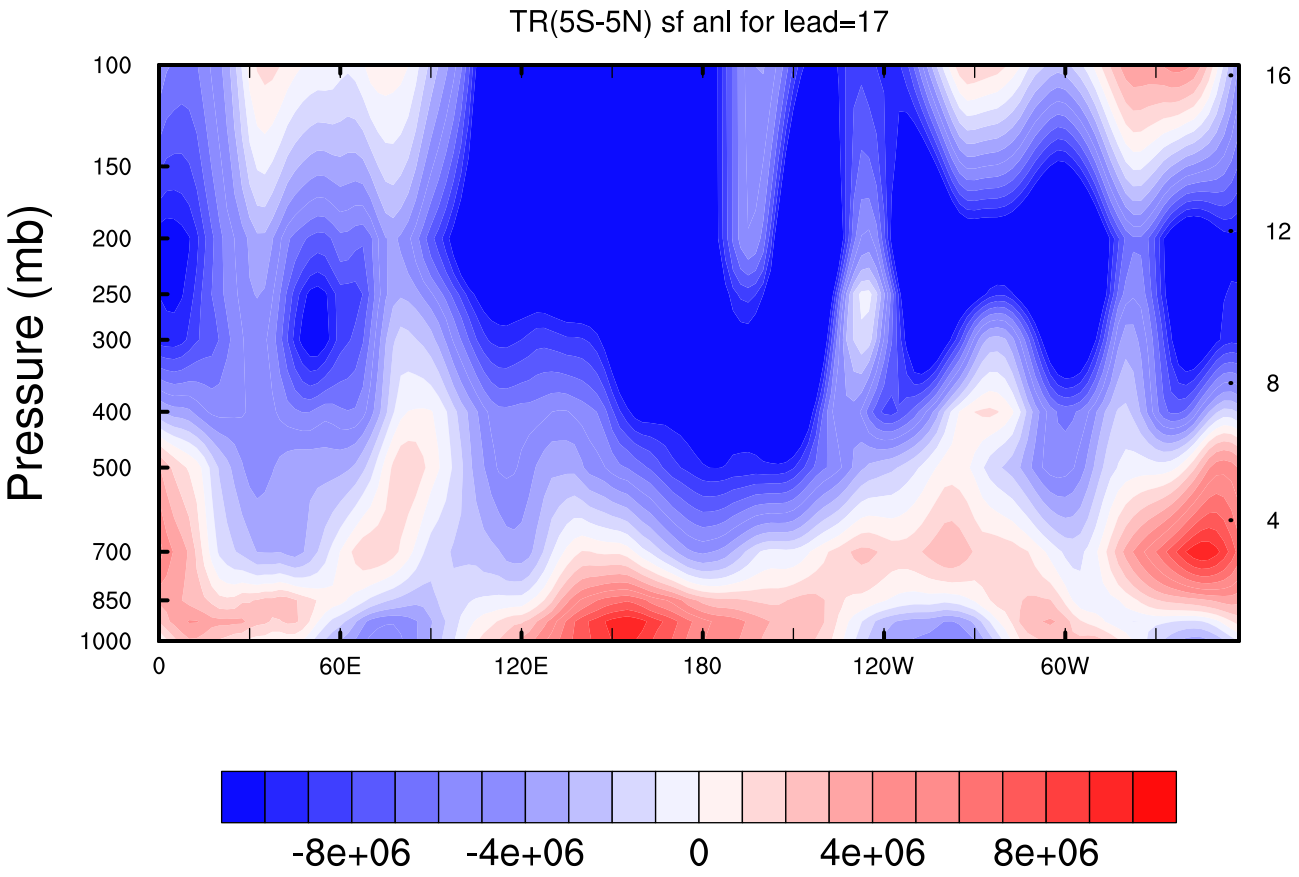
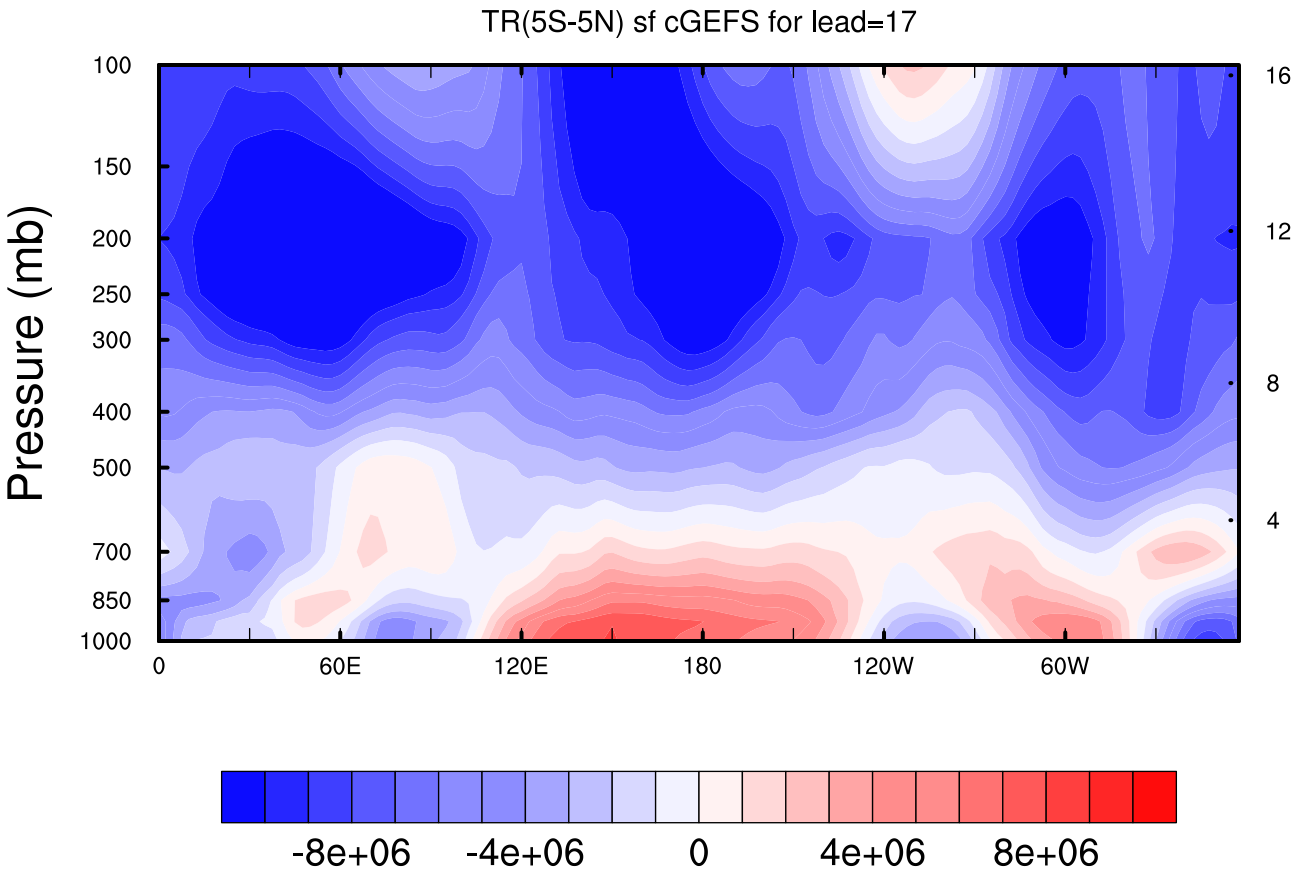
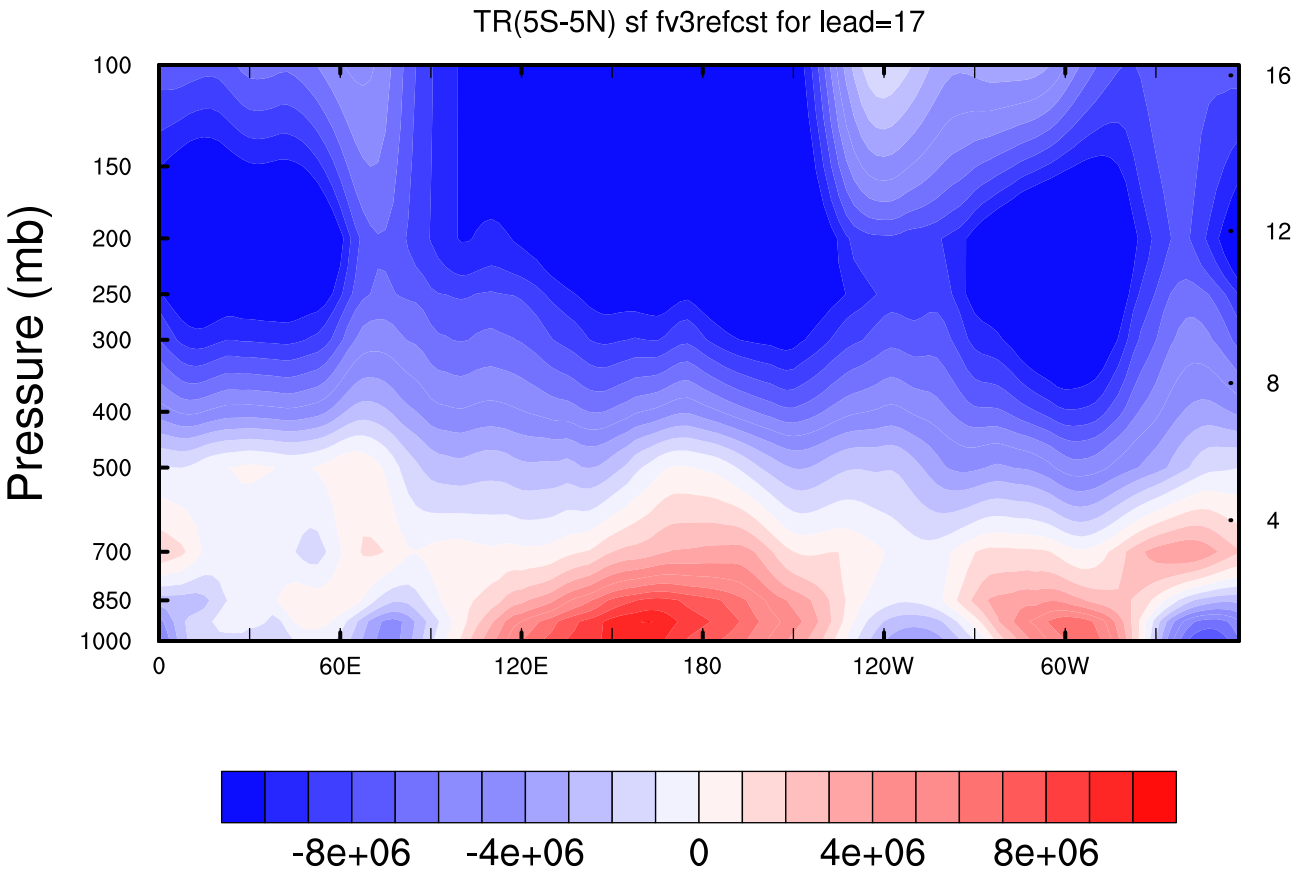
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

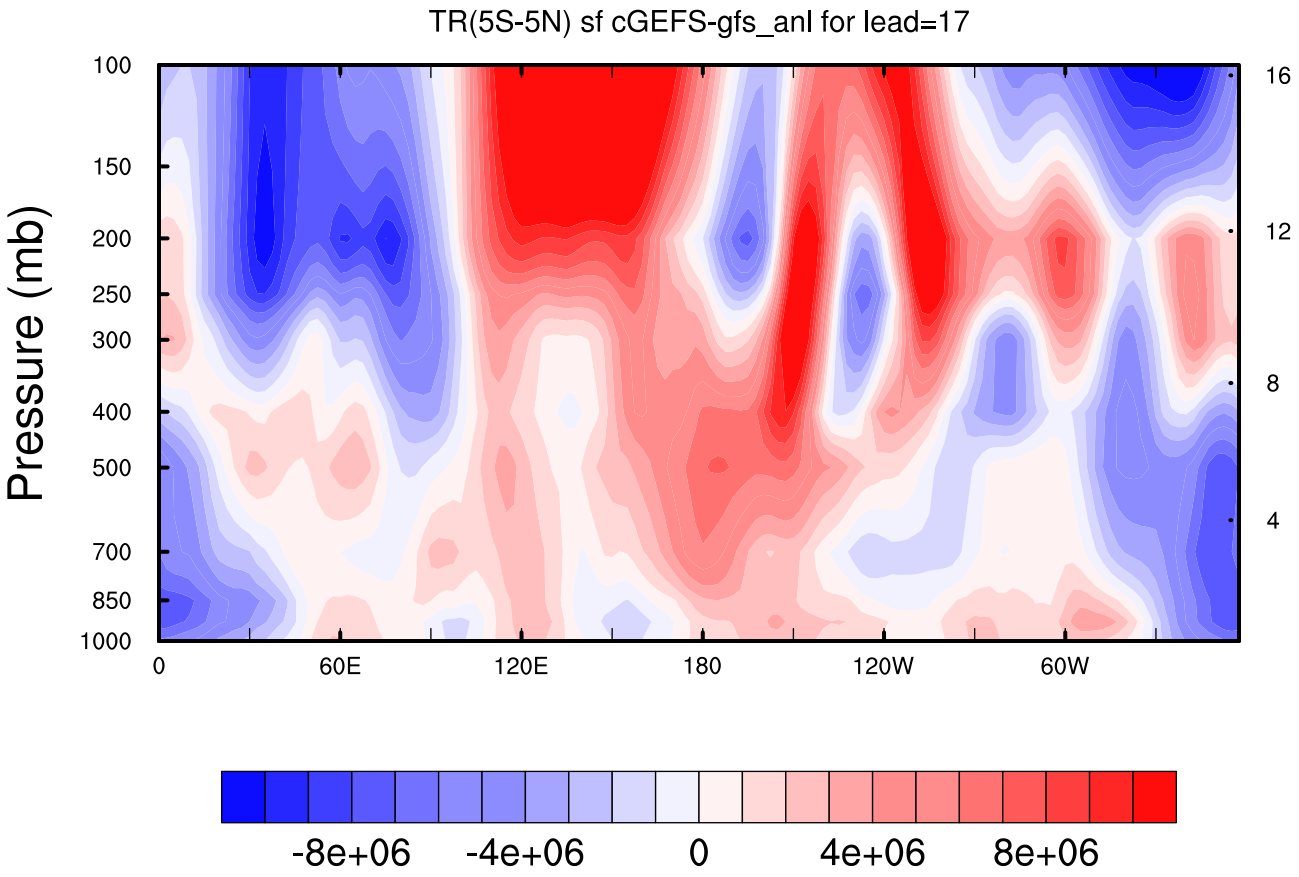

vp 200hPa cGEFS-gfs_anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

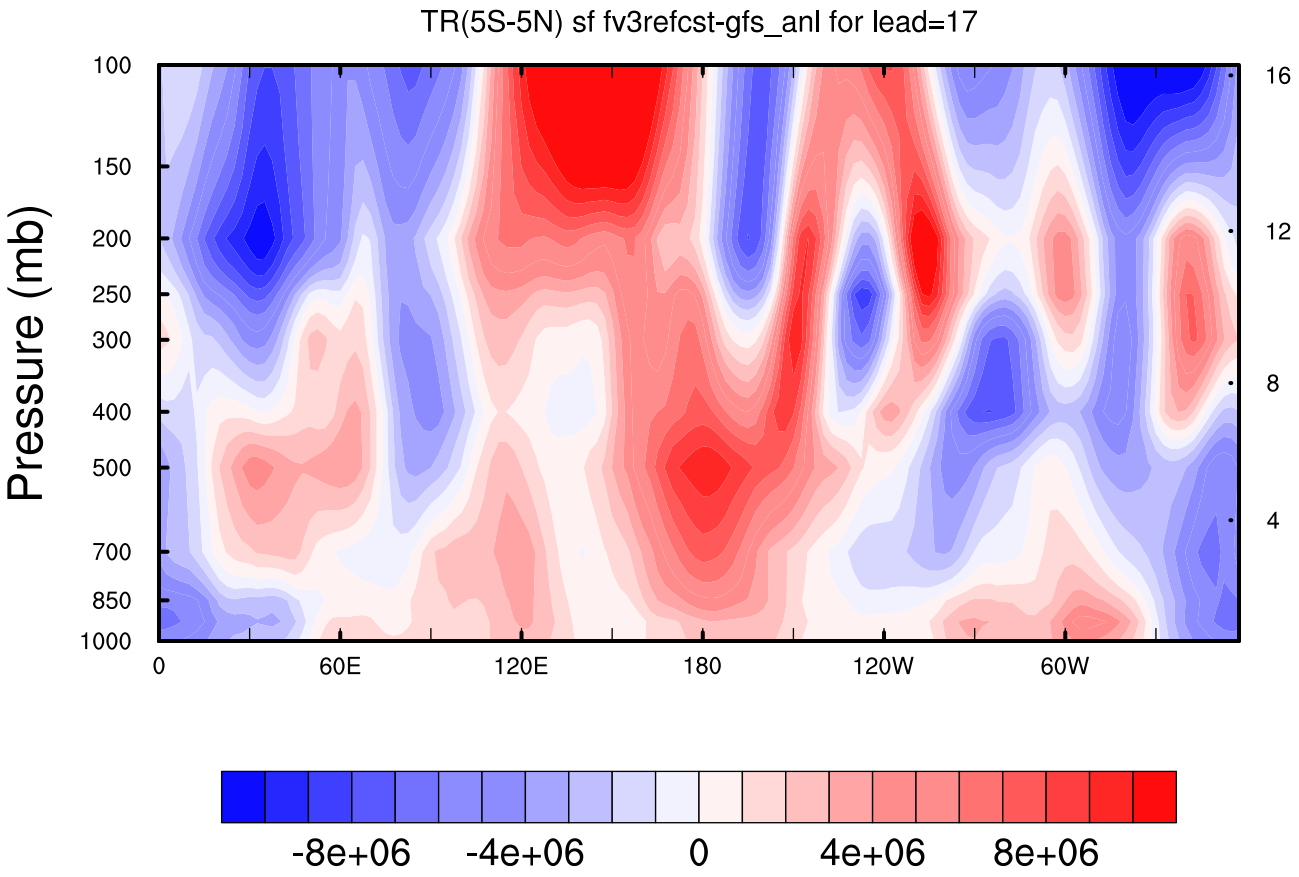

vp 200hPa fv3refcst-gfs_anl for lead=17
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

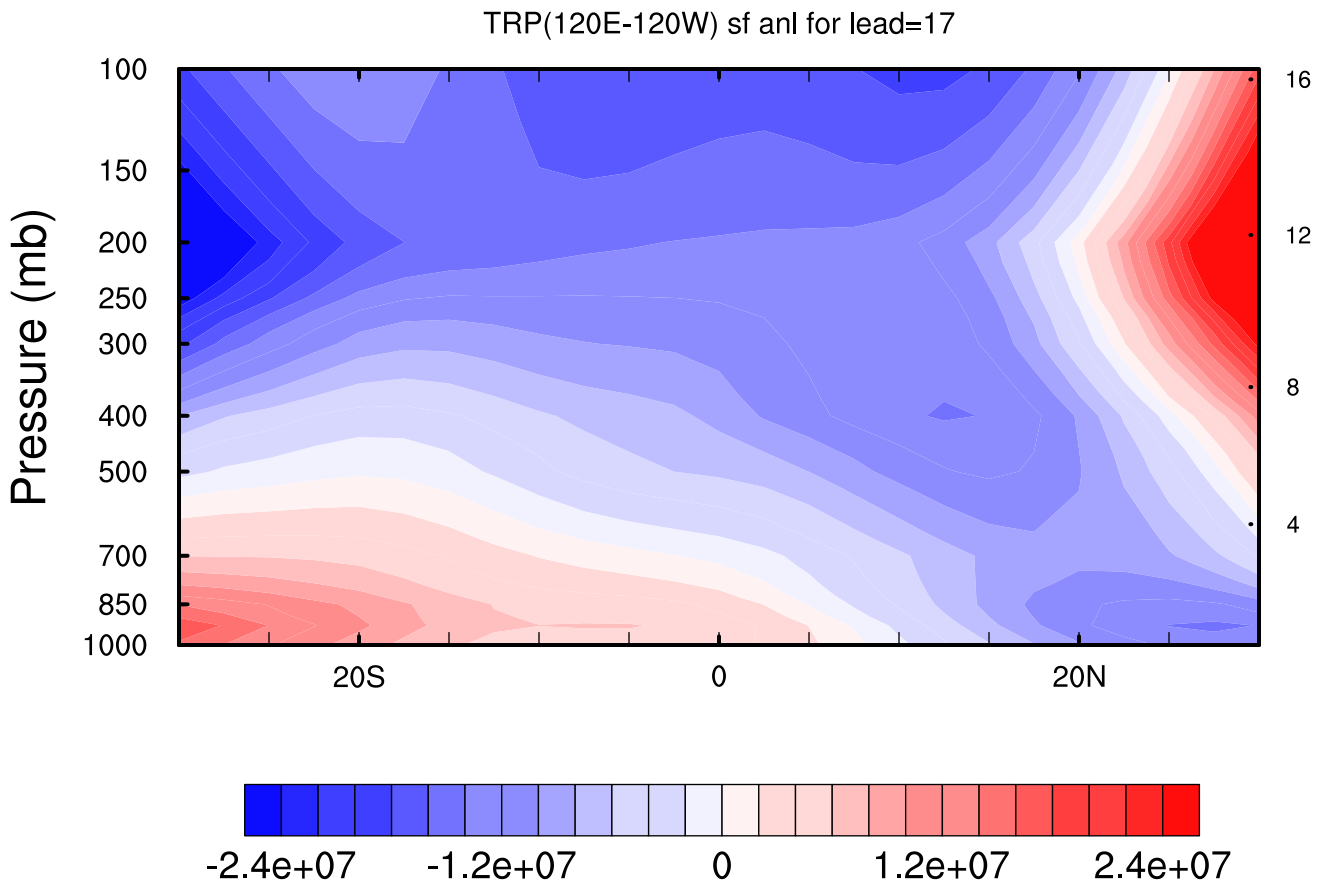

TR(5S-5N) sf anl for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

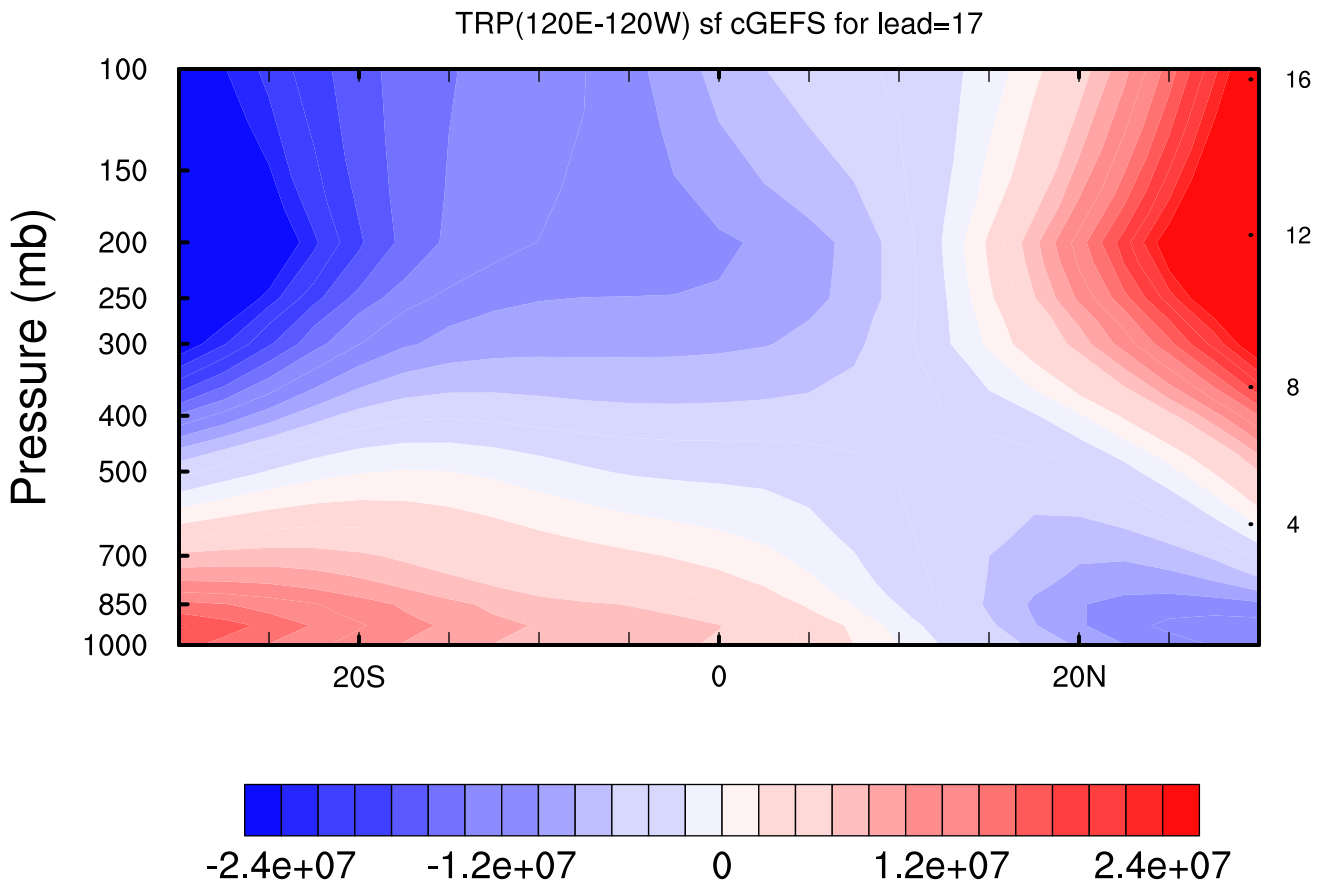

TR(5S-5N) sf cGEFS for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

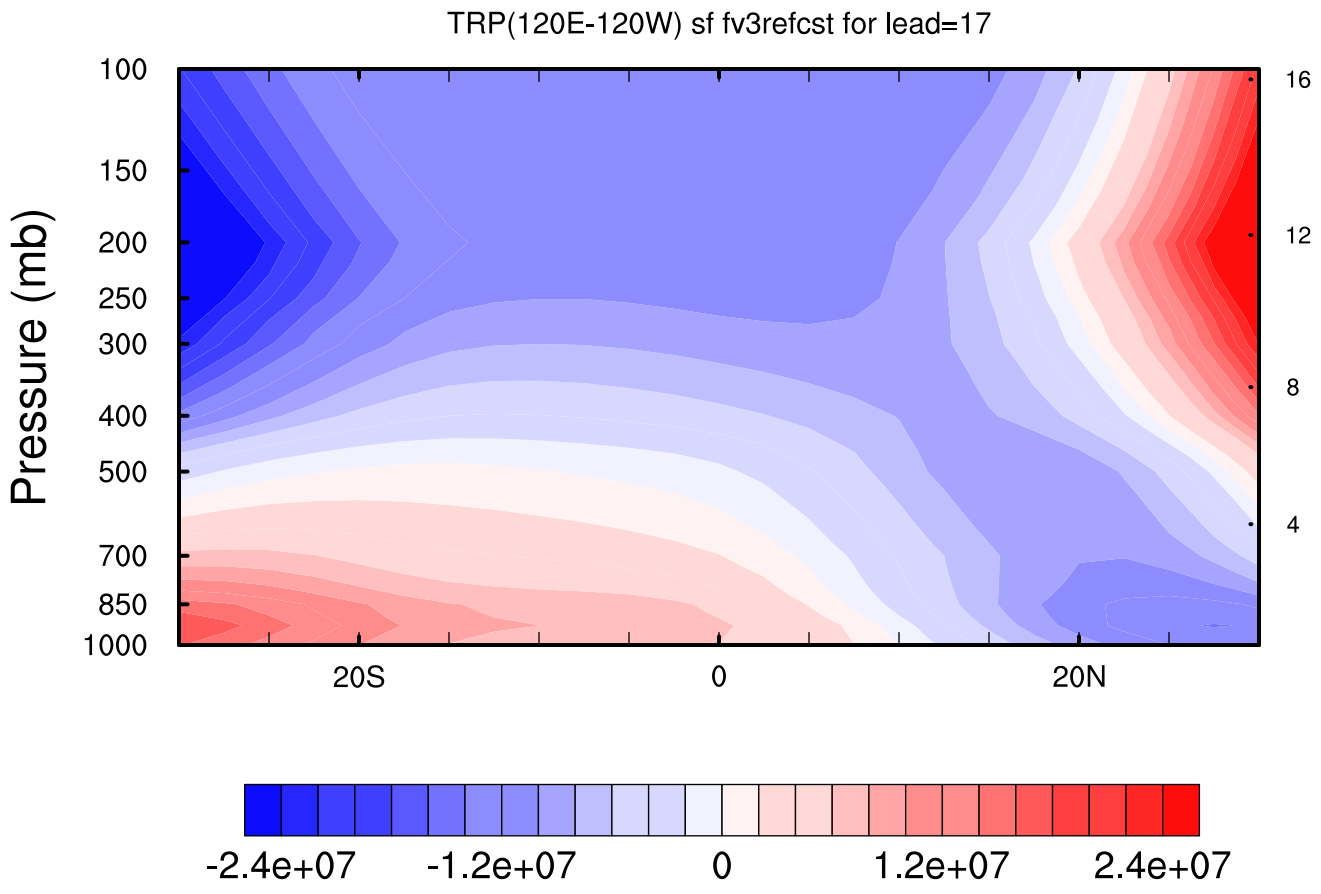

TR(5S-5N) sf fv3refcst for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

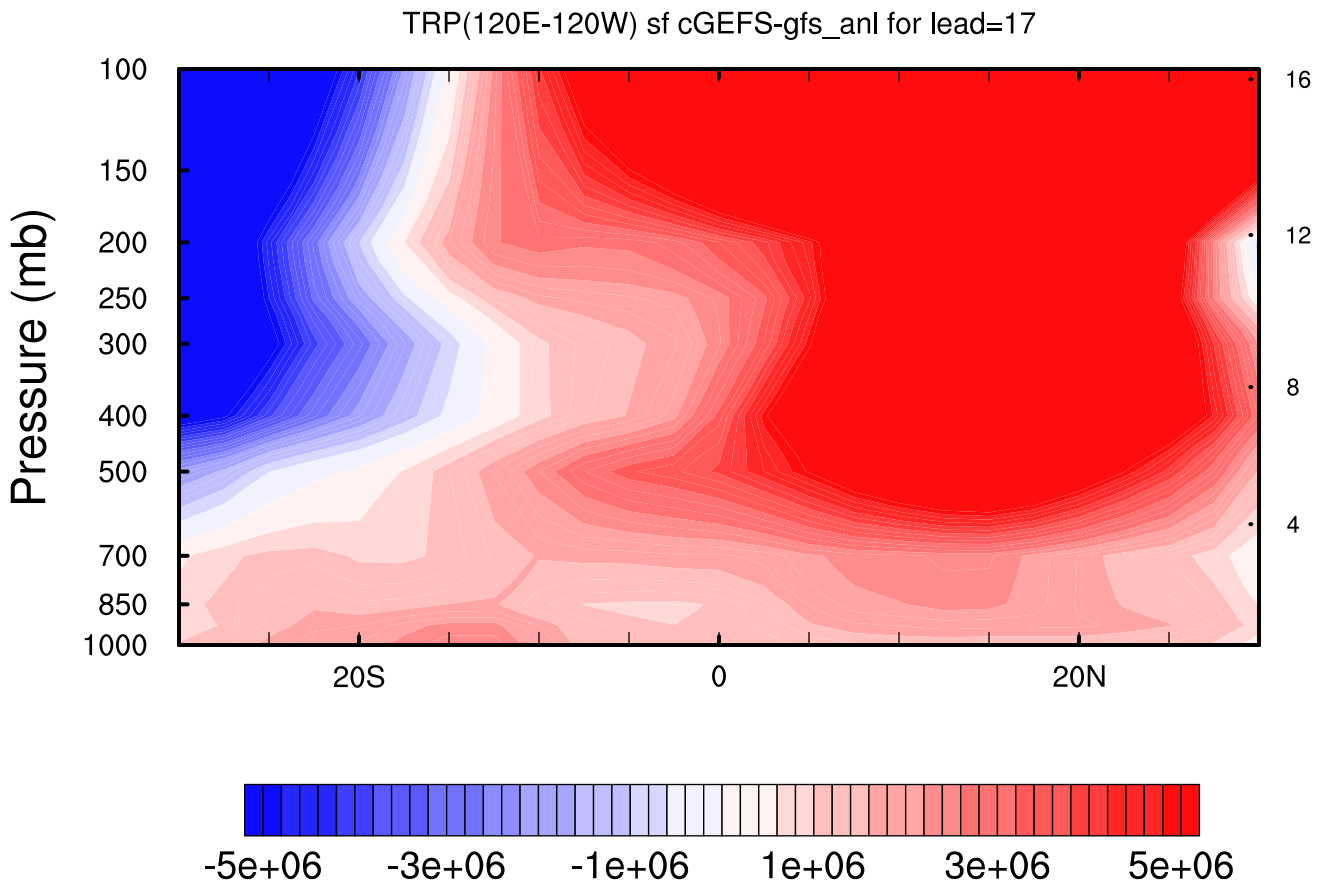

TR(5S-5N) sf cGEFS-gfs_anl for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

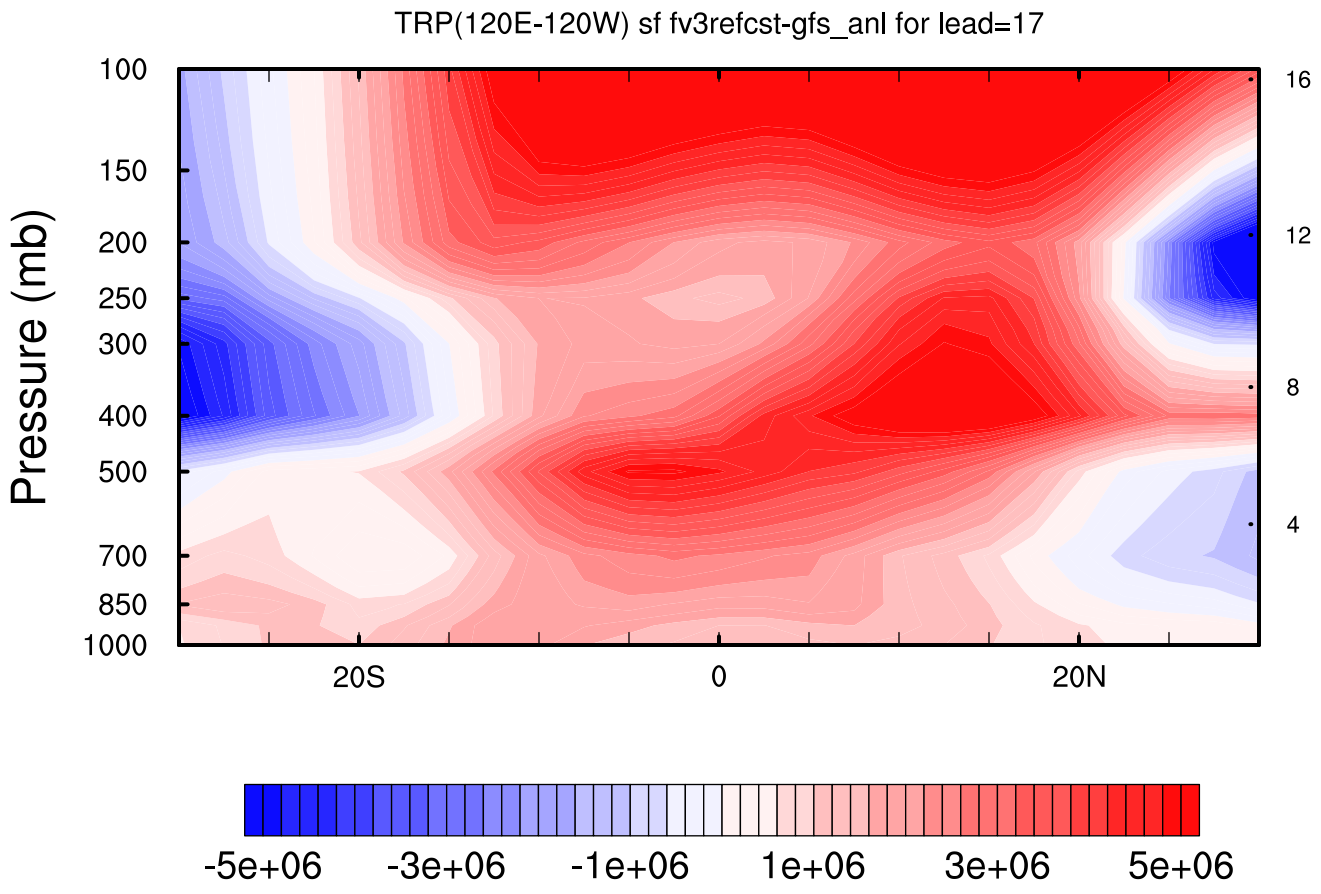

TR(5S-5N) sf fv3refcst-gfs_anl for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

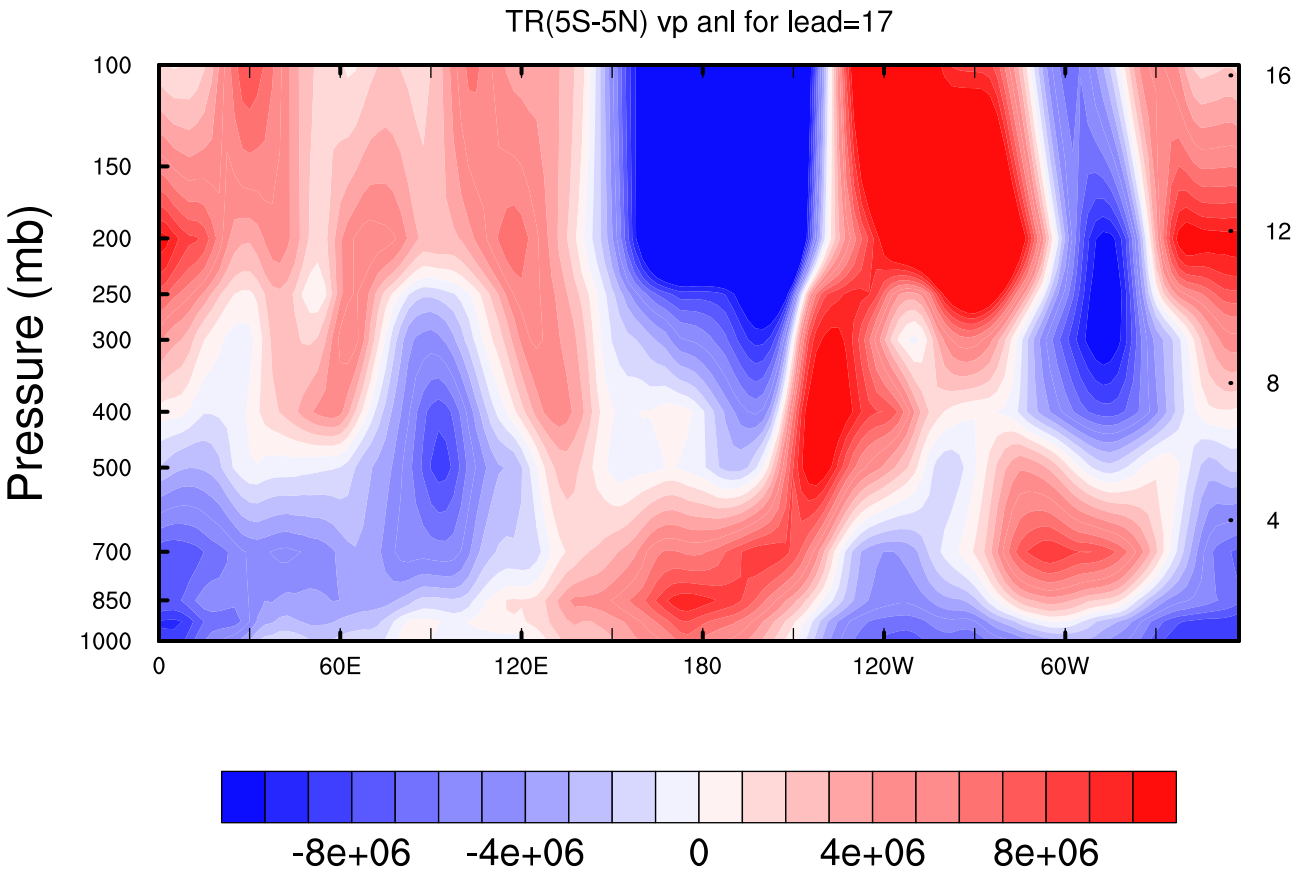

TRP(120E-120W) sf anl for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

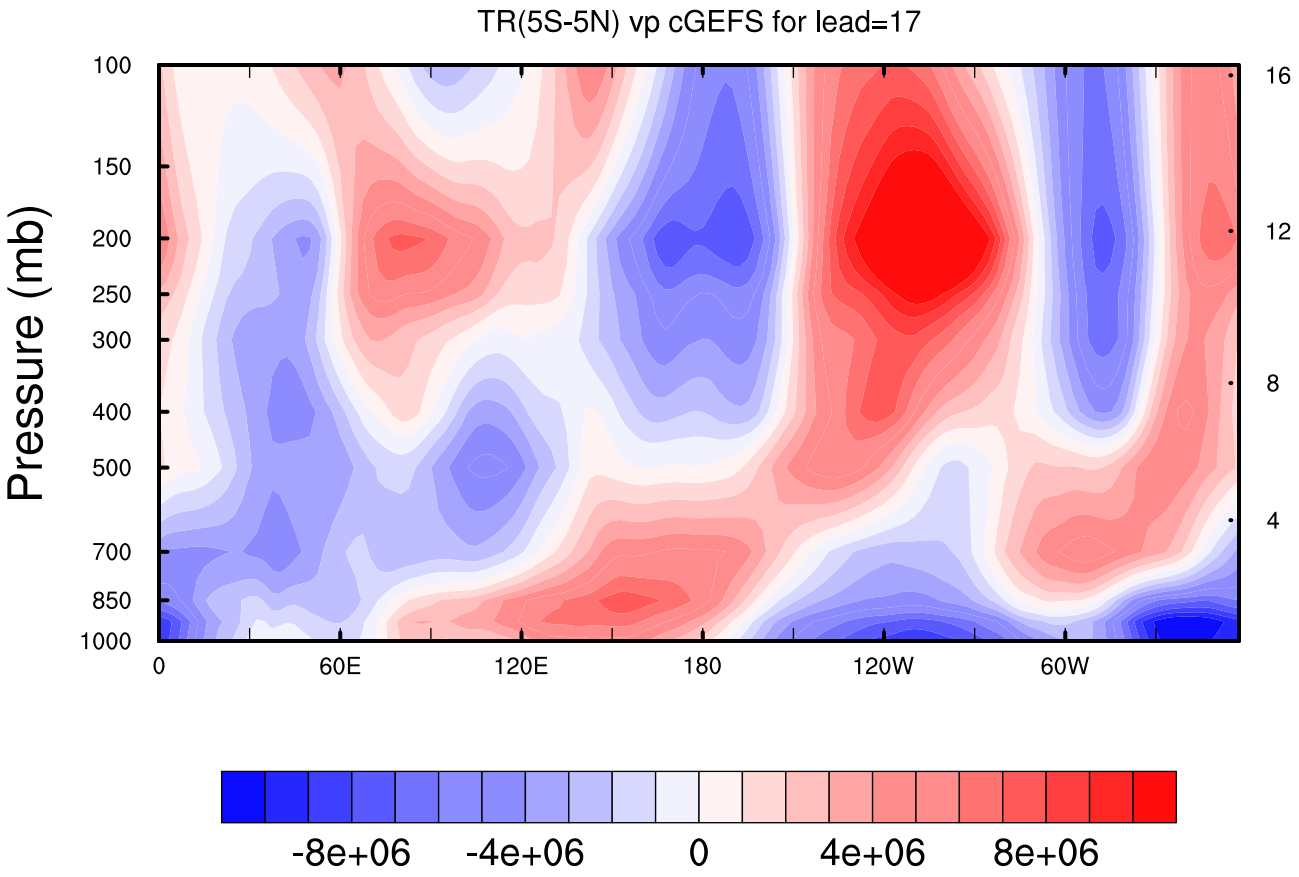

TRP(120E-120W) sf cGEFS for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


TRP(120E-120W) sf fv3refcst for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


TRP(120E-120W) sf cGEFS-gfs_anl for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06


TRP(120E-120W) sf fv3refcst-gfs_anl for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06


TR(5S-5N) vp anl for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
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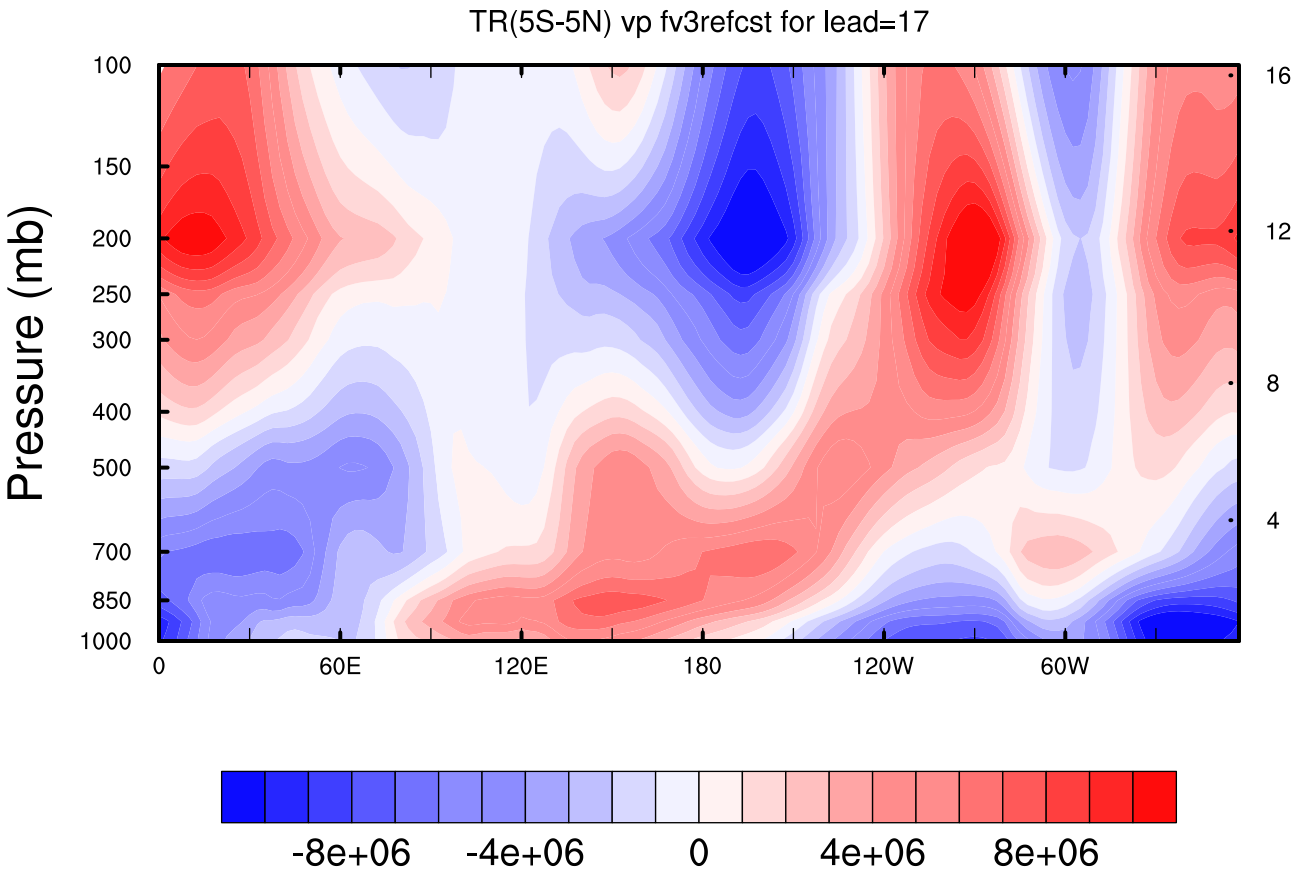
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
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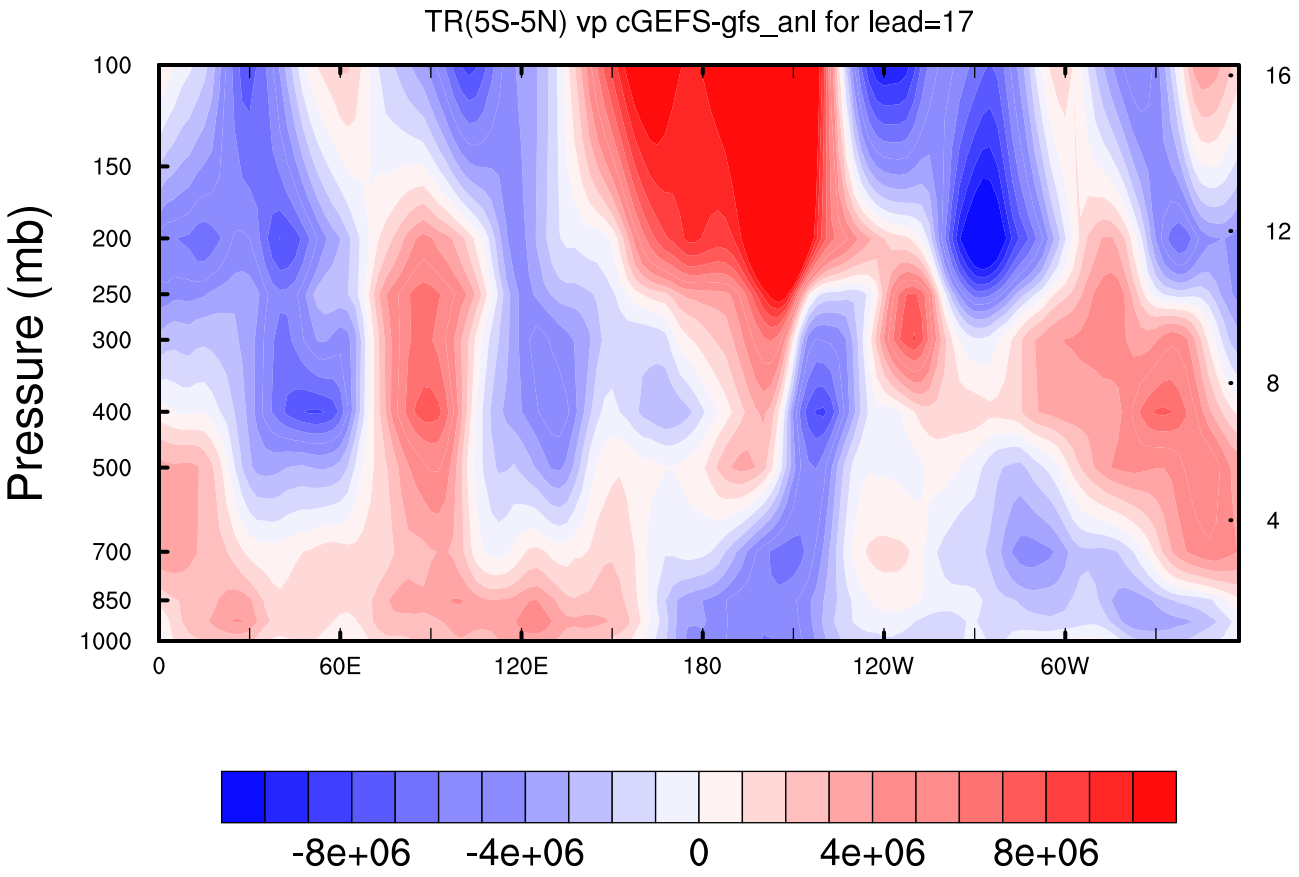
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS-gfs_anl for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
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120W
60W
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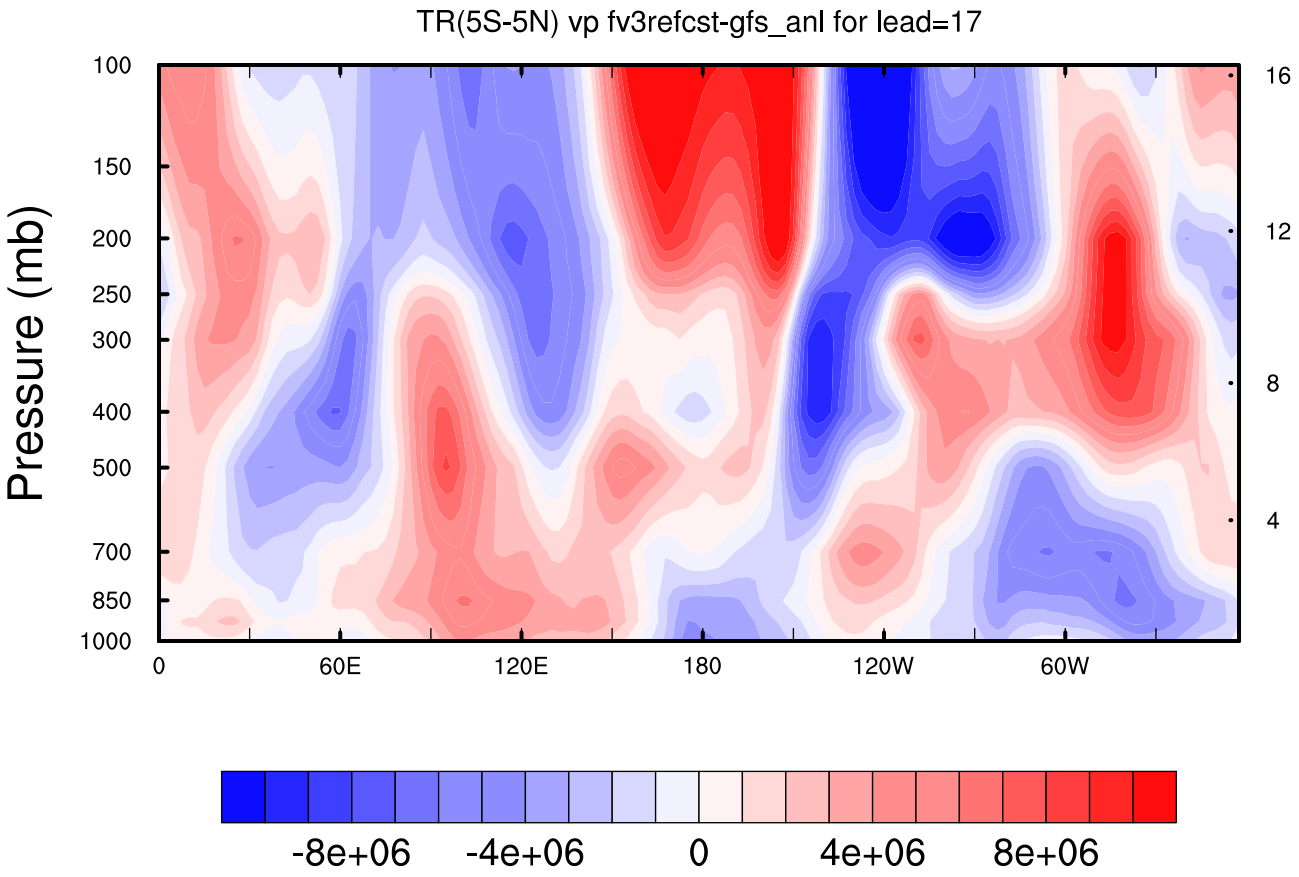
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst-gfs_anl for lead=17
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
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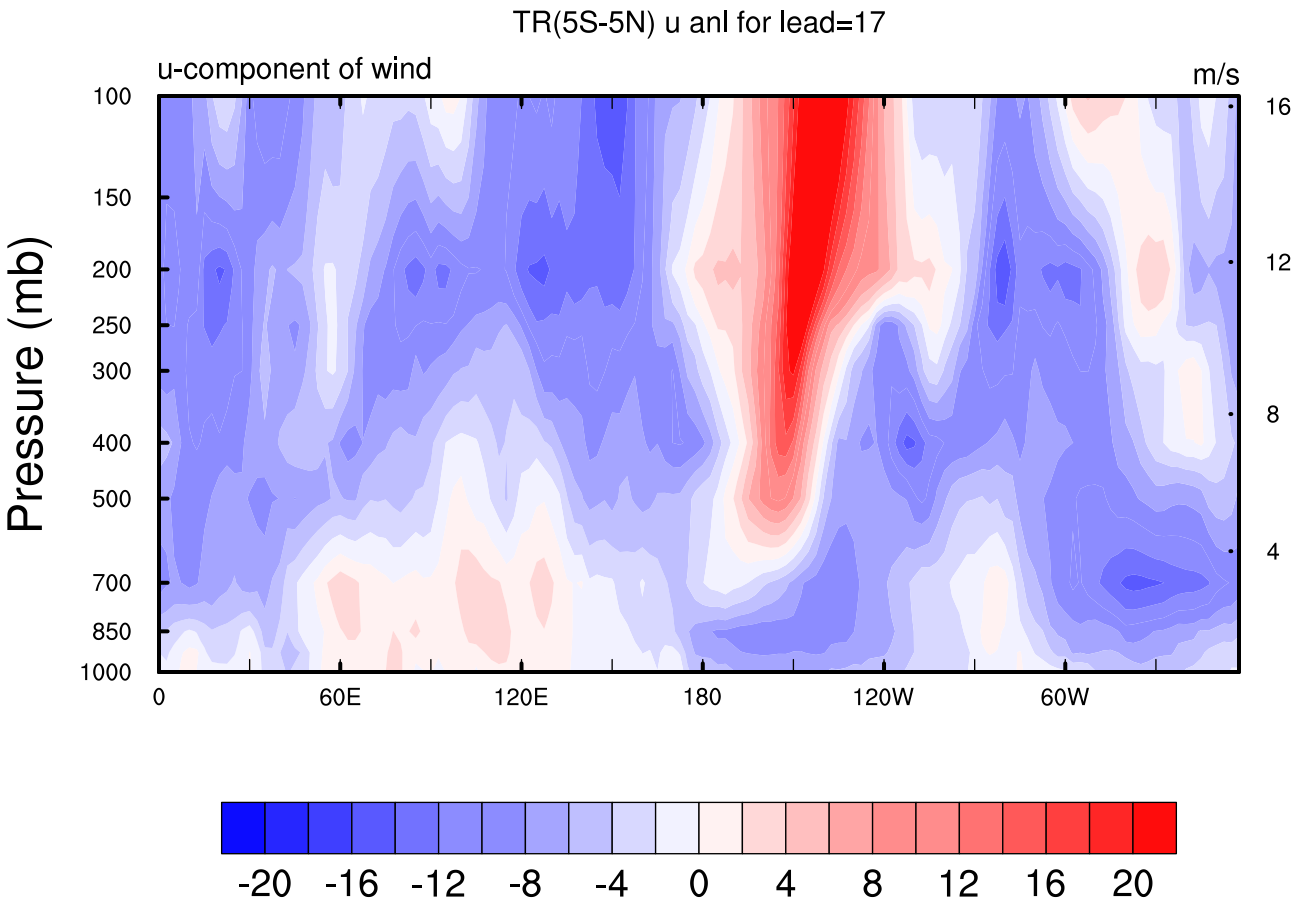
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) u anl for lead=17
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
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12
8
4
-20
-16
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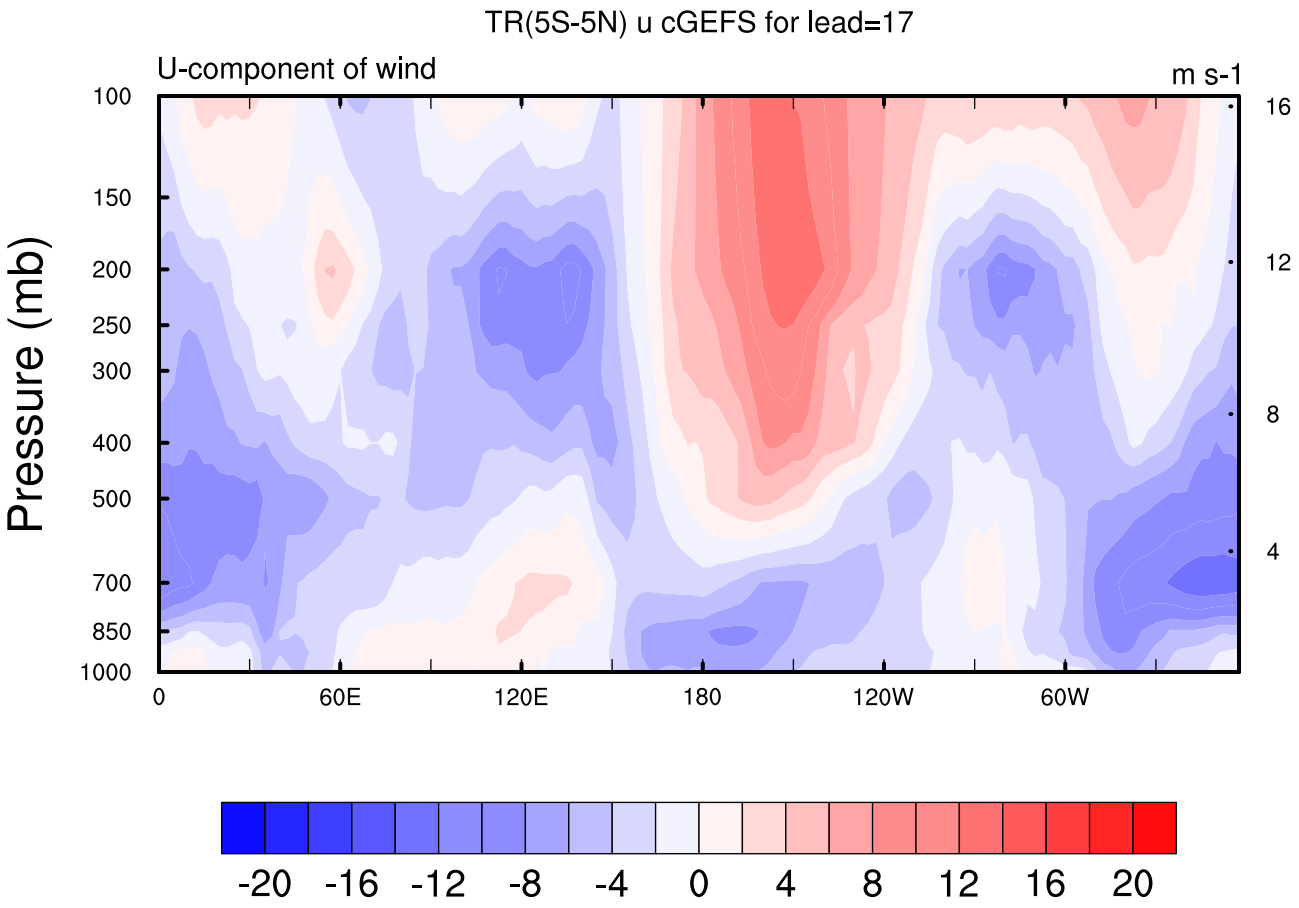
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS for lead=17
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
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12
8
4
-20
-16
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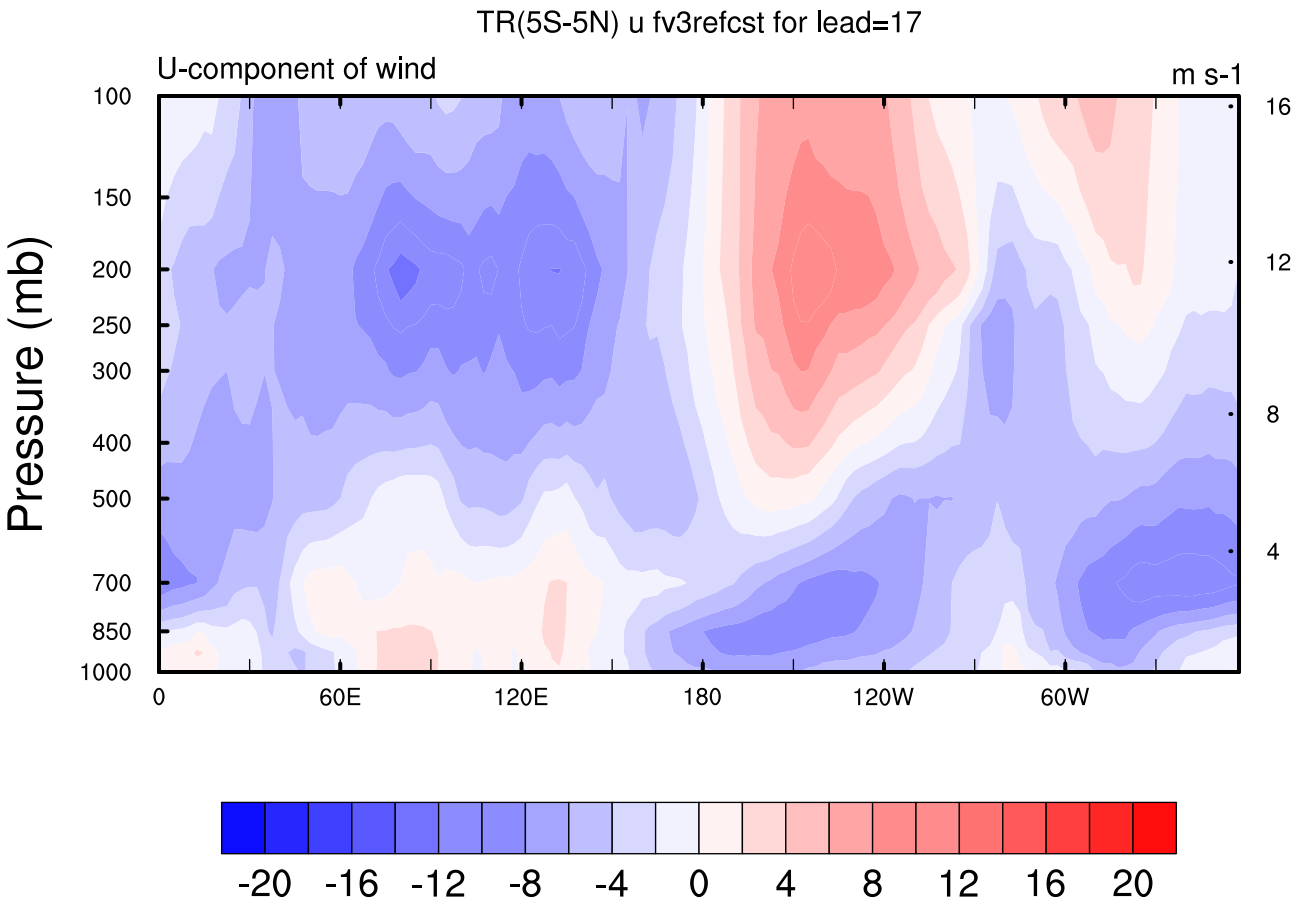
-8
-4
0
4
8
12
16
20


TR(5S-5N) u fv3refcst for lead=17
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
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8
4
-20
-16
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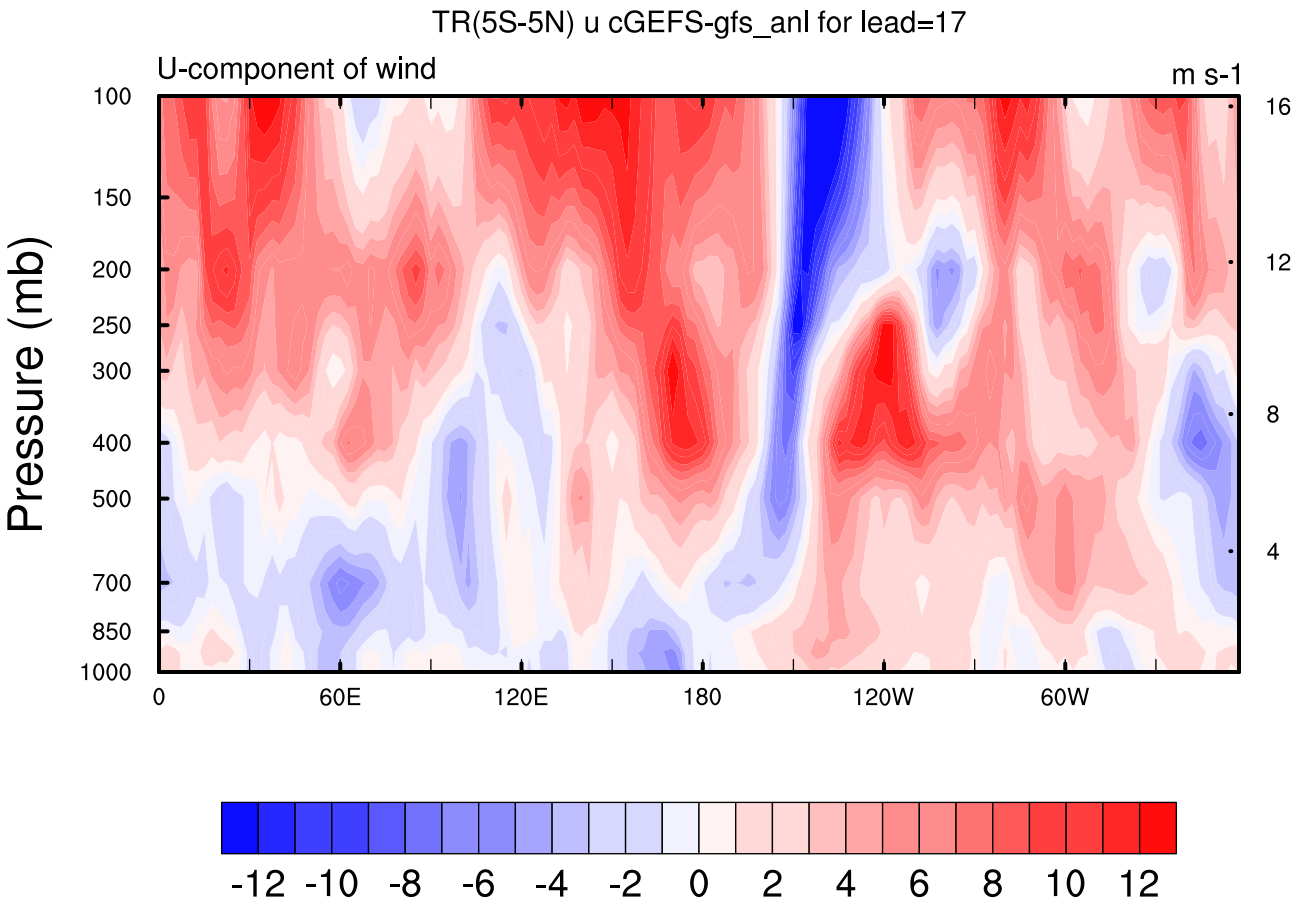
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=17
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
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4
-12
-10
-8
-6
-4
-2
0
2
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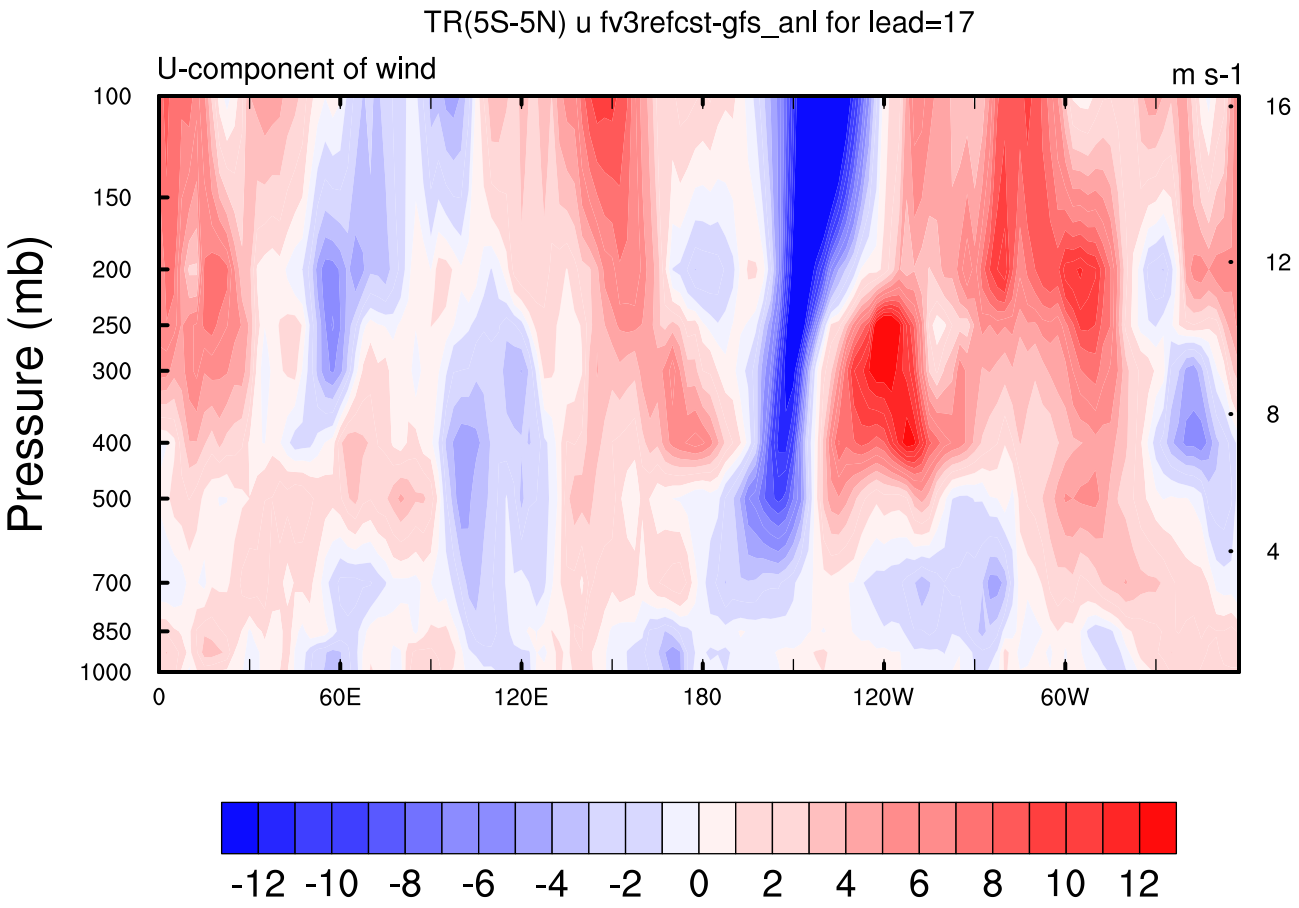
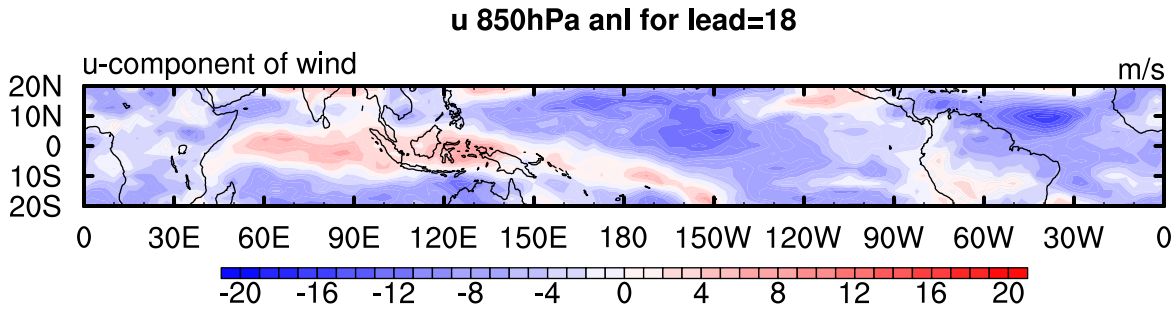
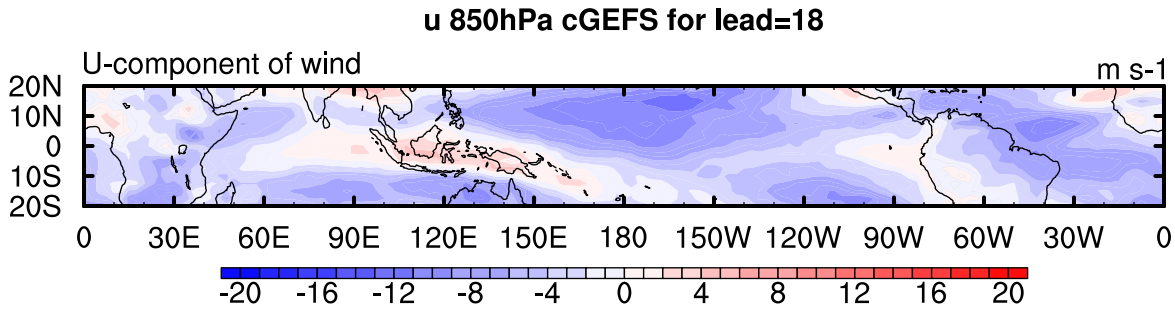
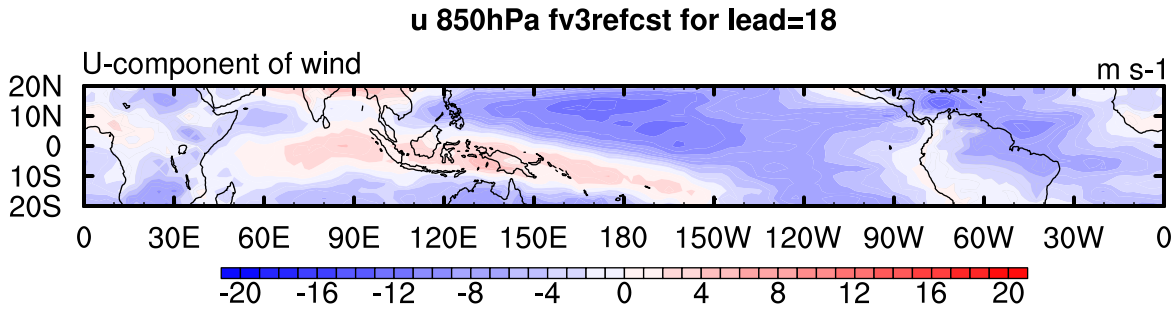
6
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=17
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


u 850hPa anl for lead=18
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS for lead=18
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa fv3refcst for lead=18
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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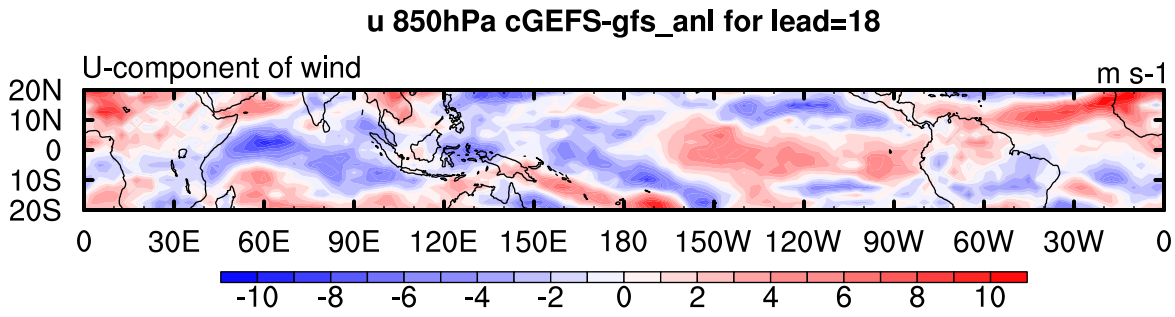
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=18
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-10
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-4
-2
0
2
4
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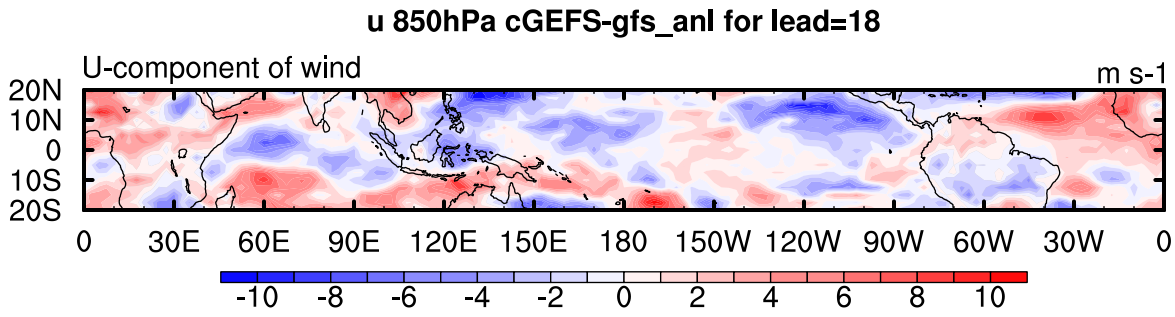
8
10


u 850hPa cGEFS-gfs_anl for lead=18
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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-10
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-6
-4
-2
0
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4
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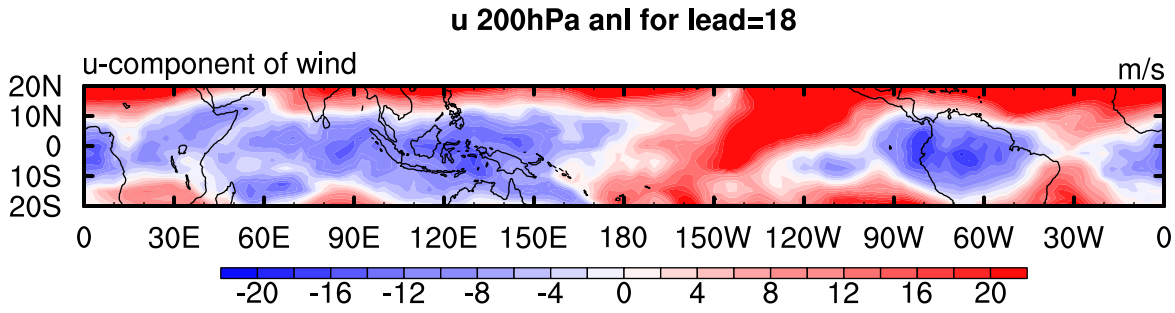
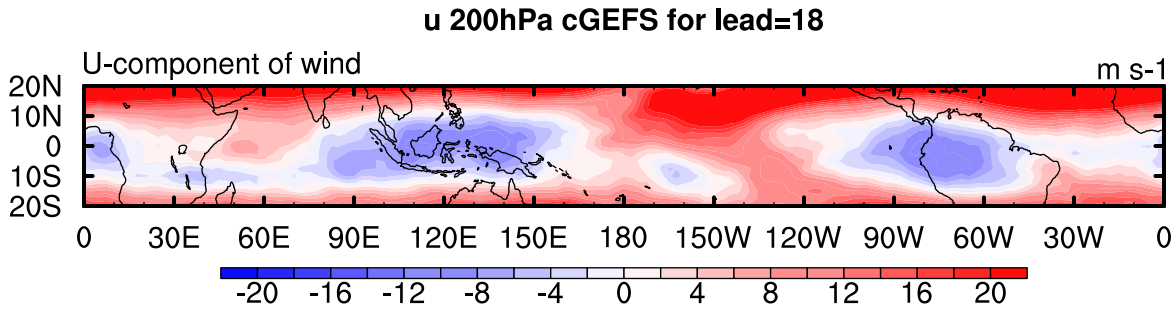
8
10


u 200hPa anl for lead=18
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=18
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
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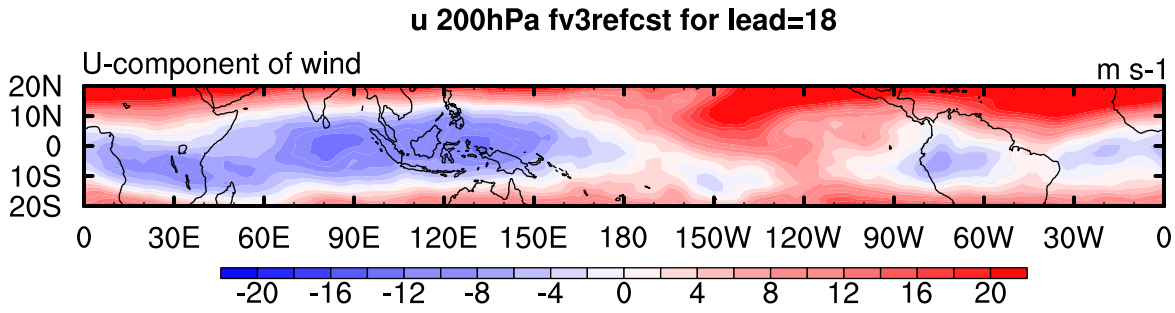
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=18
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
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-8
-4
0
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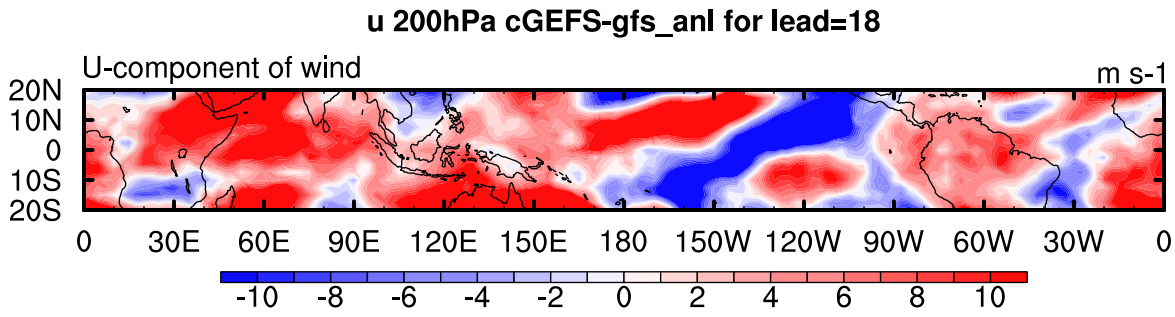
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=18
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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30W
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-10
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-2
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8
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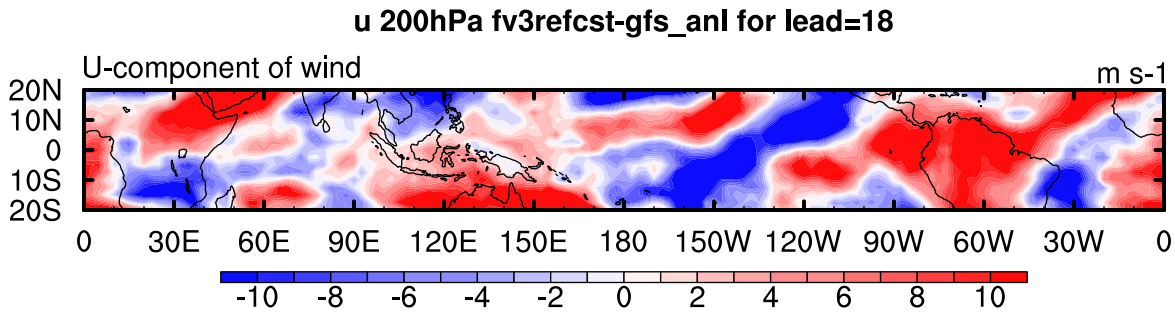
u 200hPa fv3refcst-gfs_anl for lead=18
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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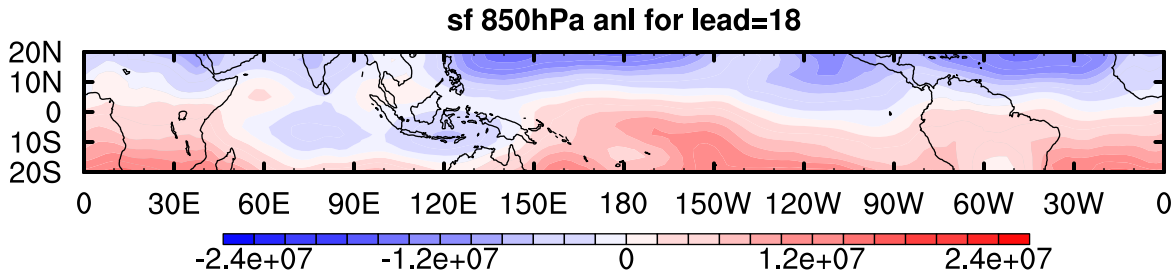
sf 850hPa anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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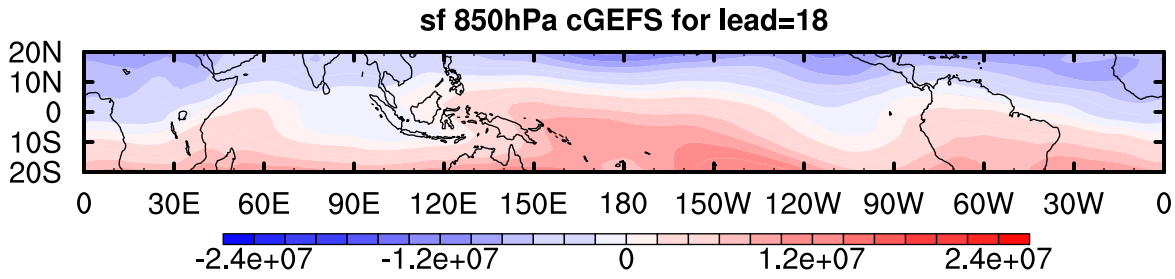
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=18
20N
10N
0
10S
20S
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30E
60E
90E
120E
150E
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30W
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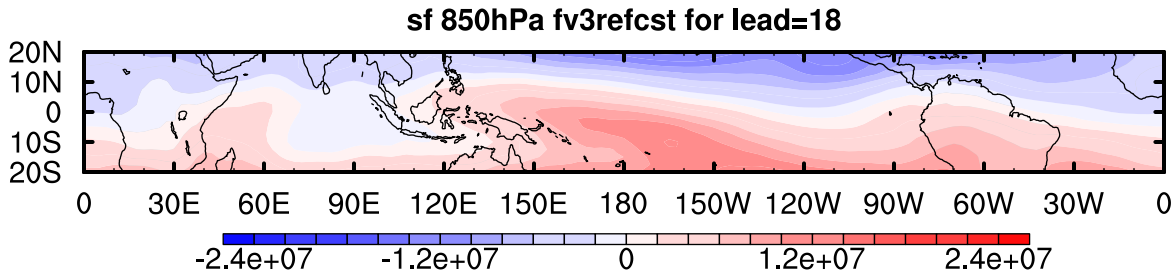
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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30W
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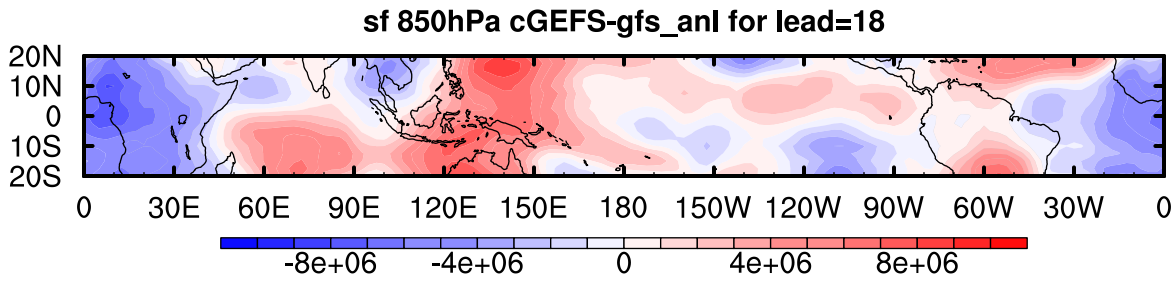
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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120W
90W
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30W
0
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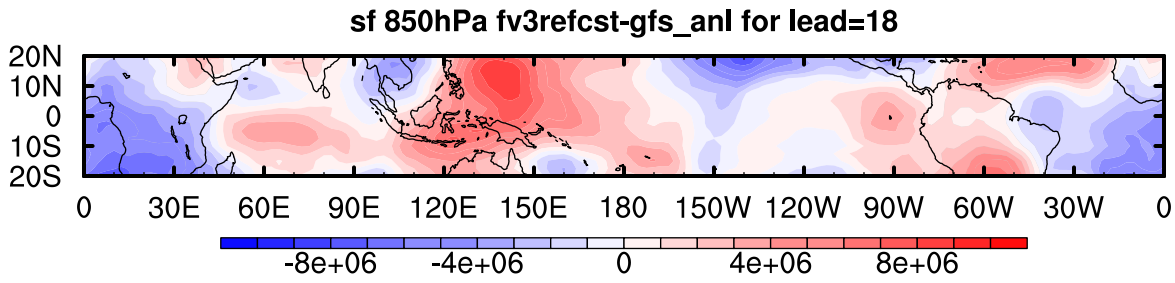
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
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30W
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-8e+06
-4e+06
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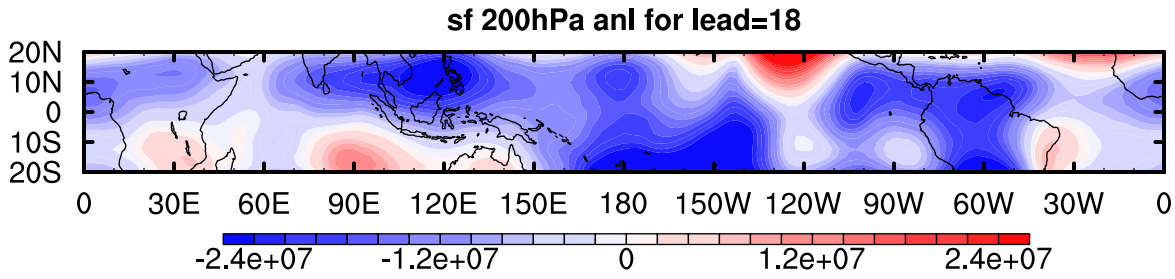
4e+06
8e+06


sf 200hPa anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-1.2e+07
0
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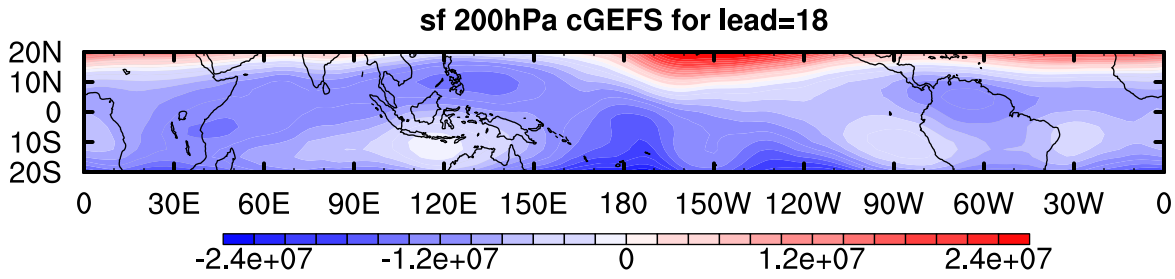
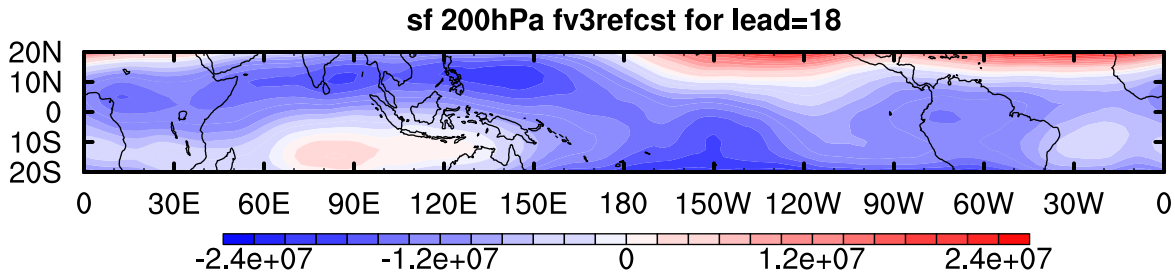
2.4e+07


sf 200hPa cGEFS for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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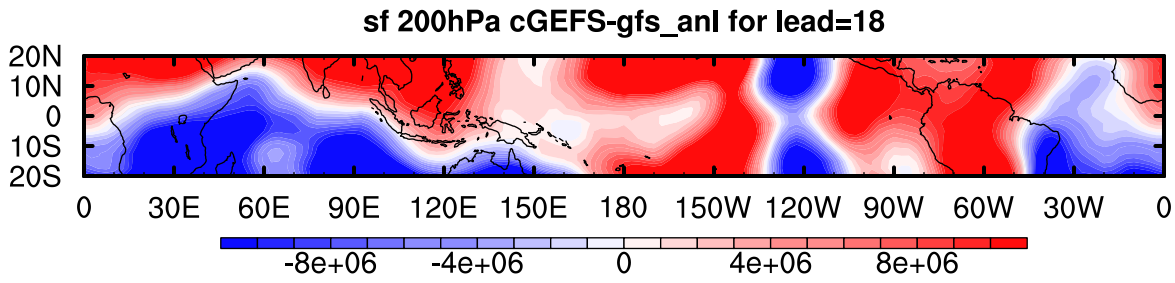
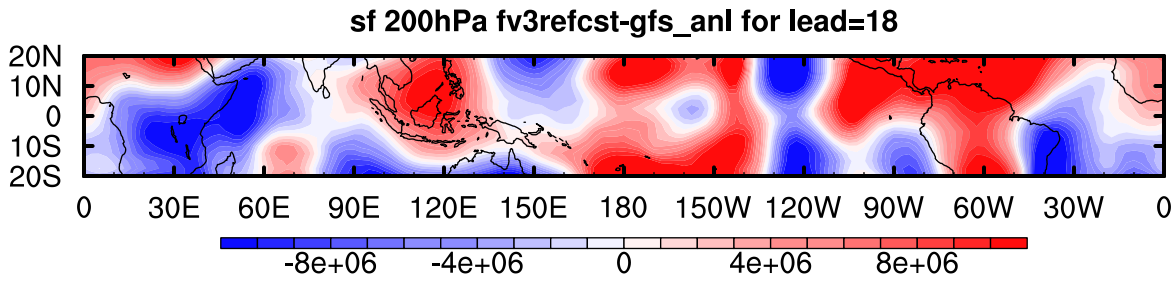
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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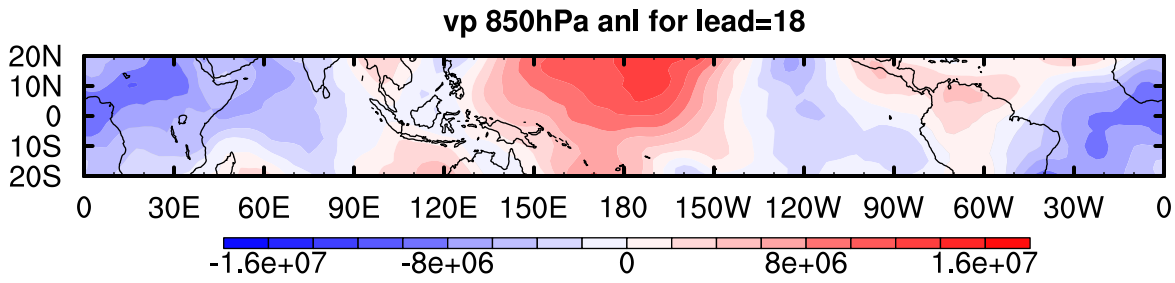
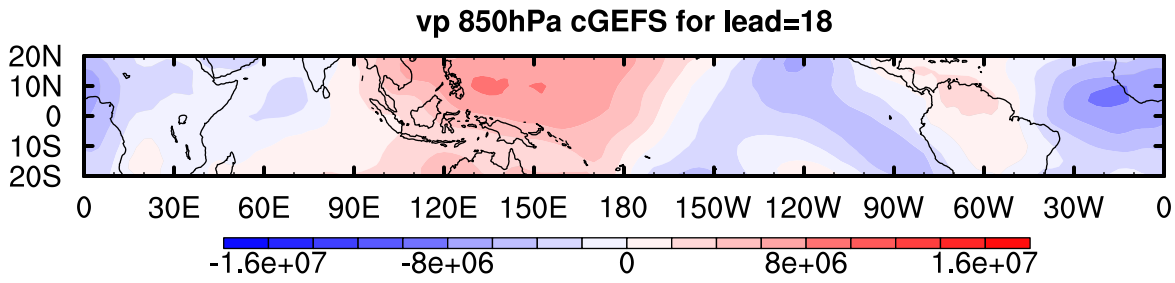
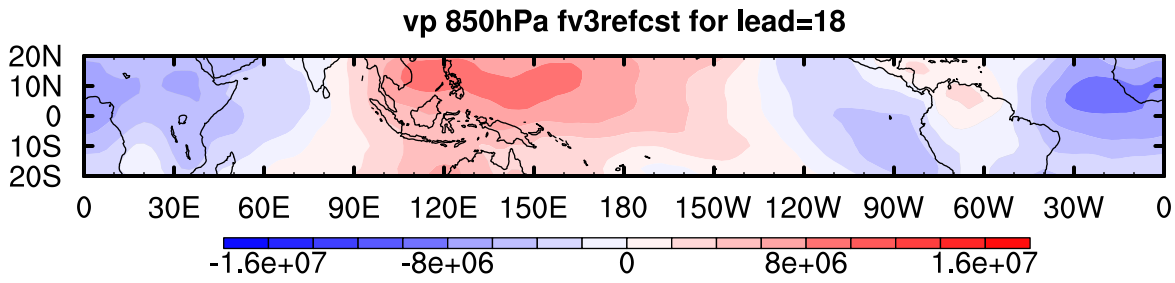
-4e+06
0
4e+06
8e+06


vp 850hPa anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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150W
120W
90W
60W
30W
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-1.6e+07
-8e+06
0
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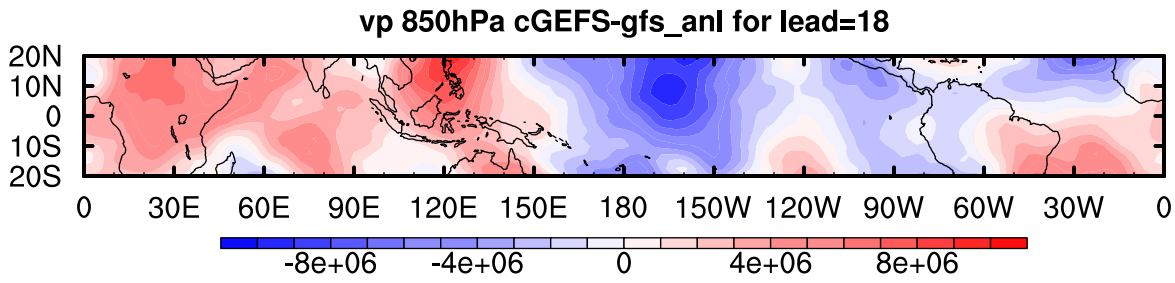
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
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180
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120W
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30W
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-4e+06
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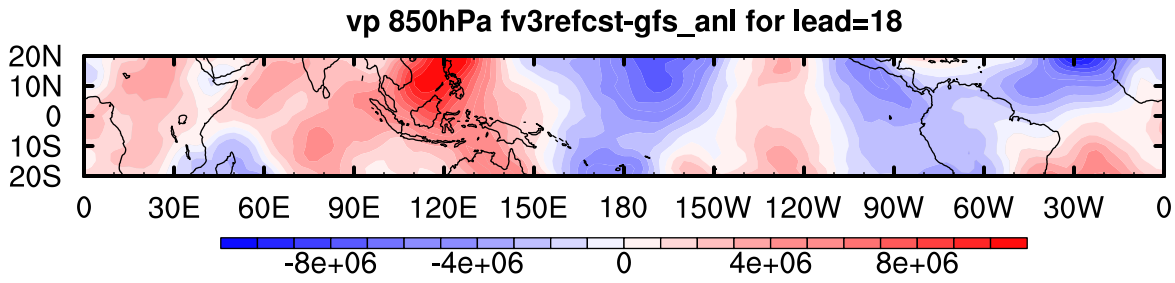
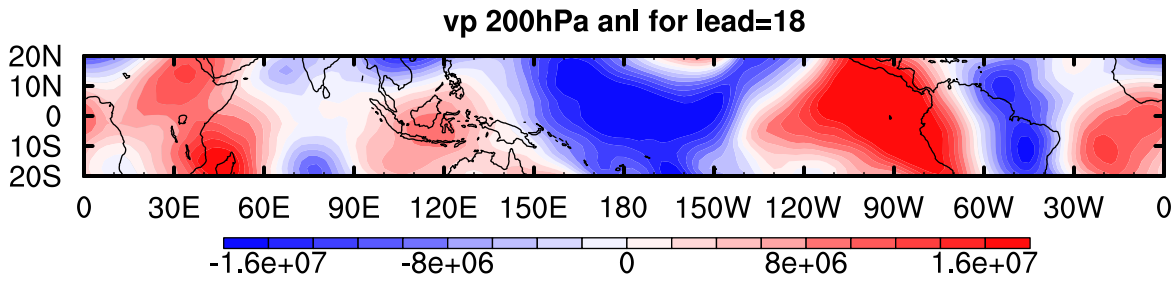
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 200hPa anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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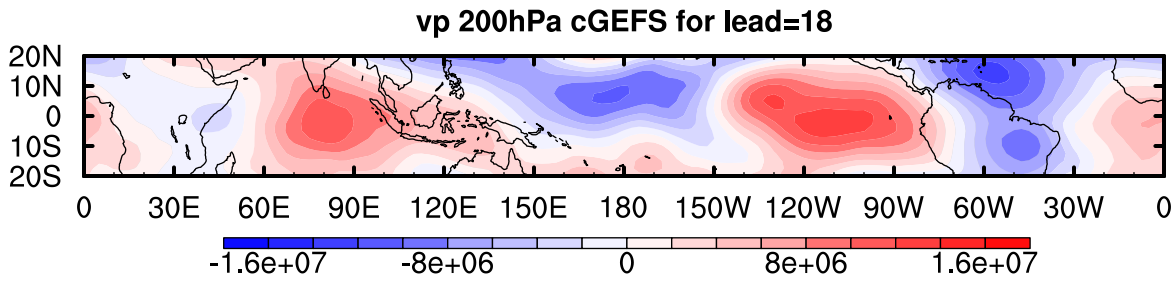
1.6e+07


vp 200hPa cGEFS for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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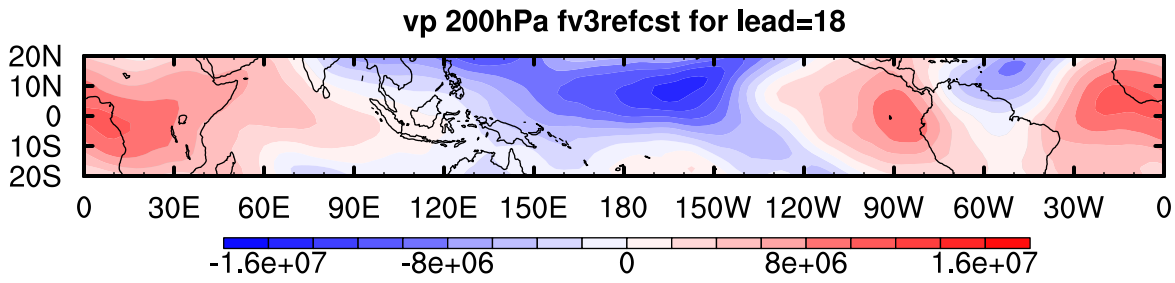
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa fv3refcst for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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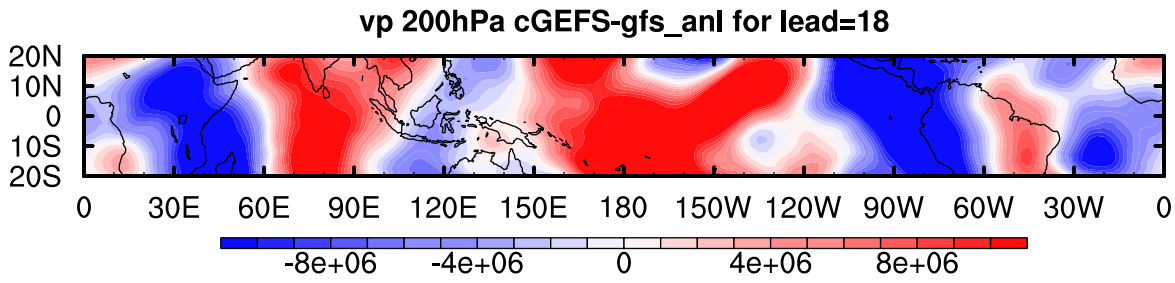
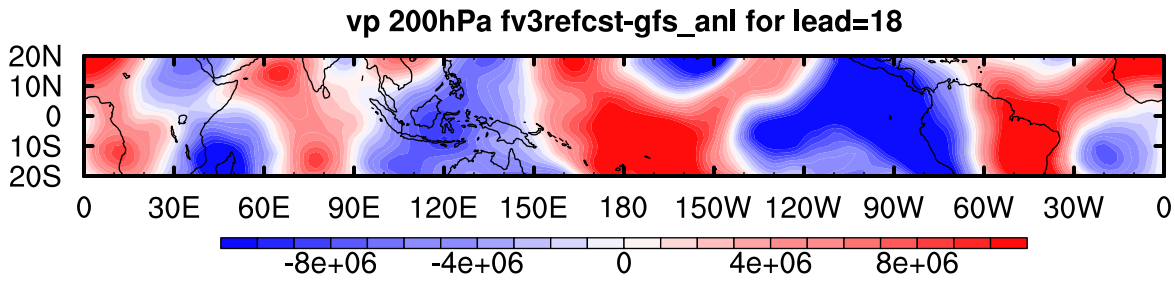
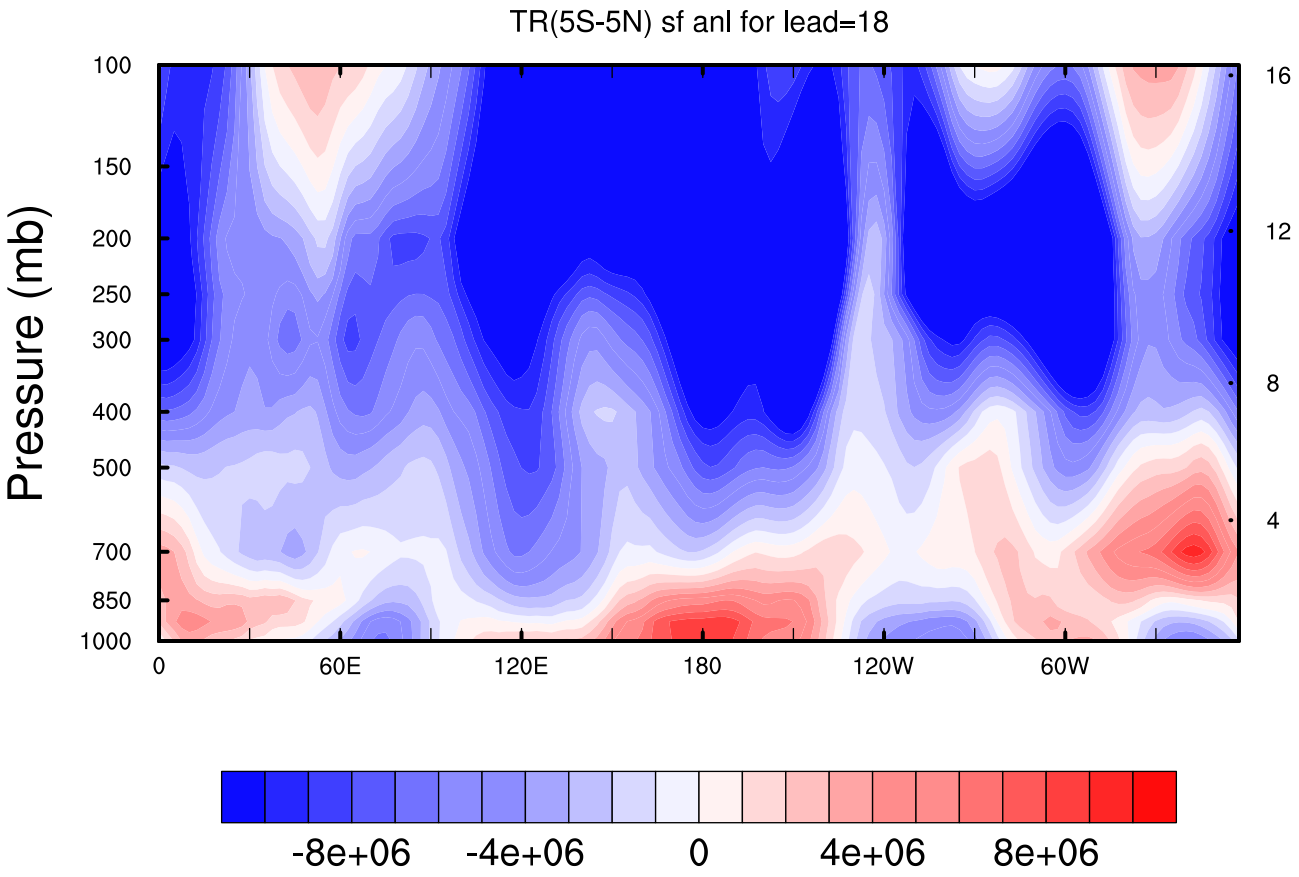
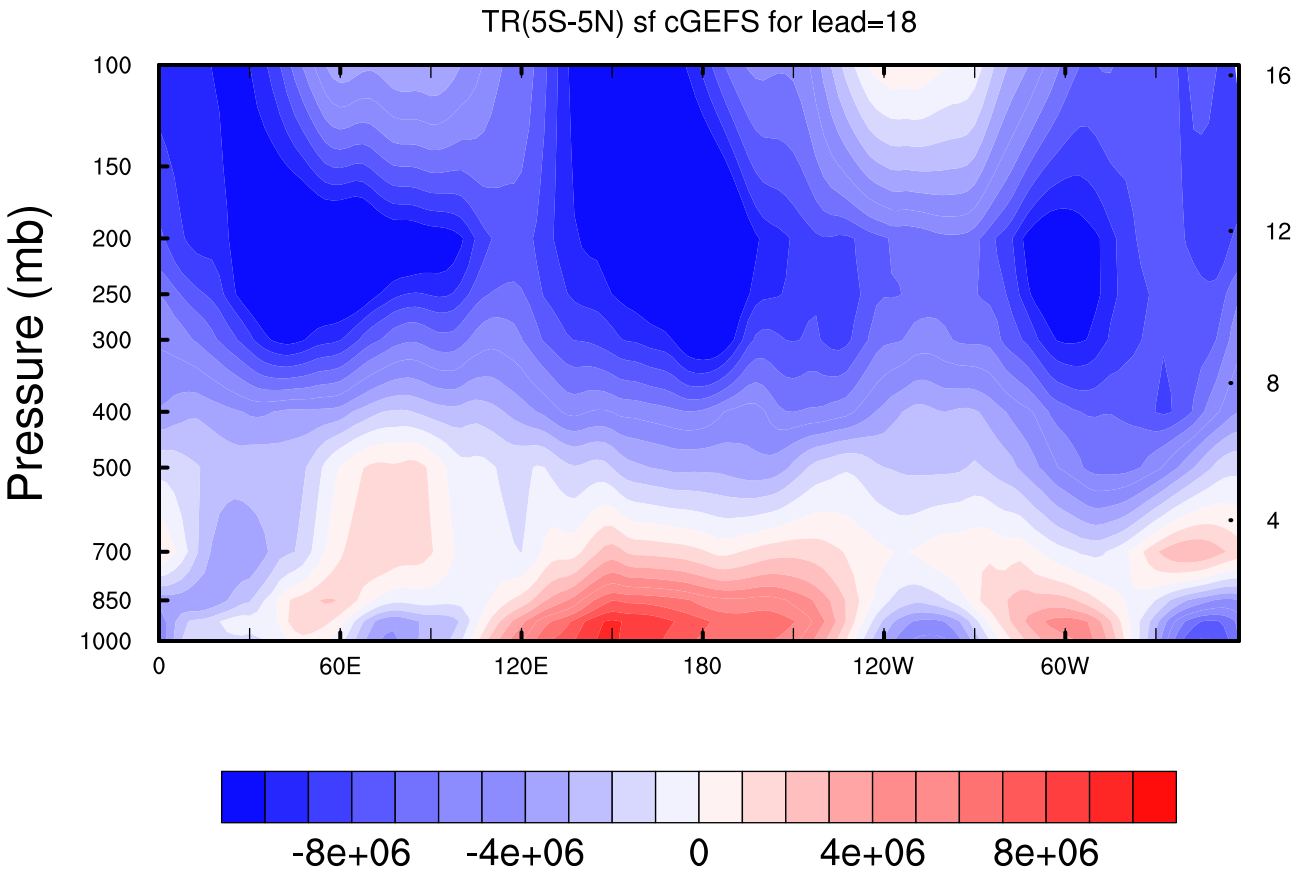
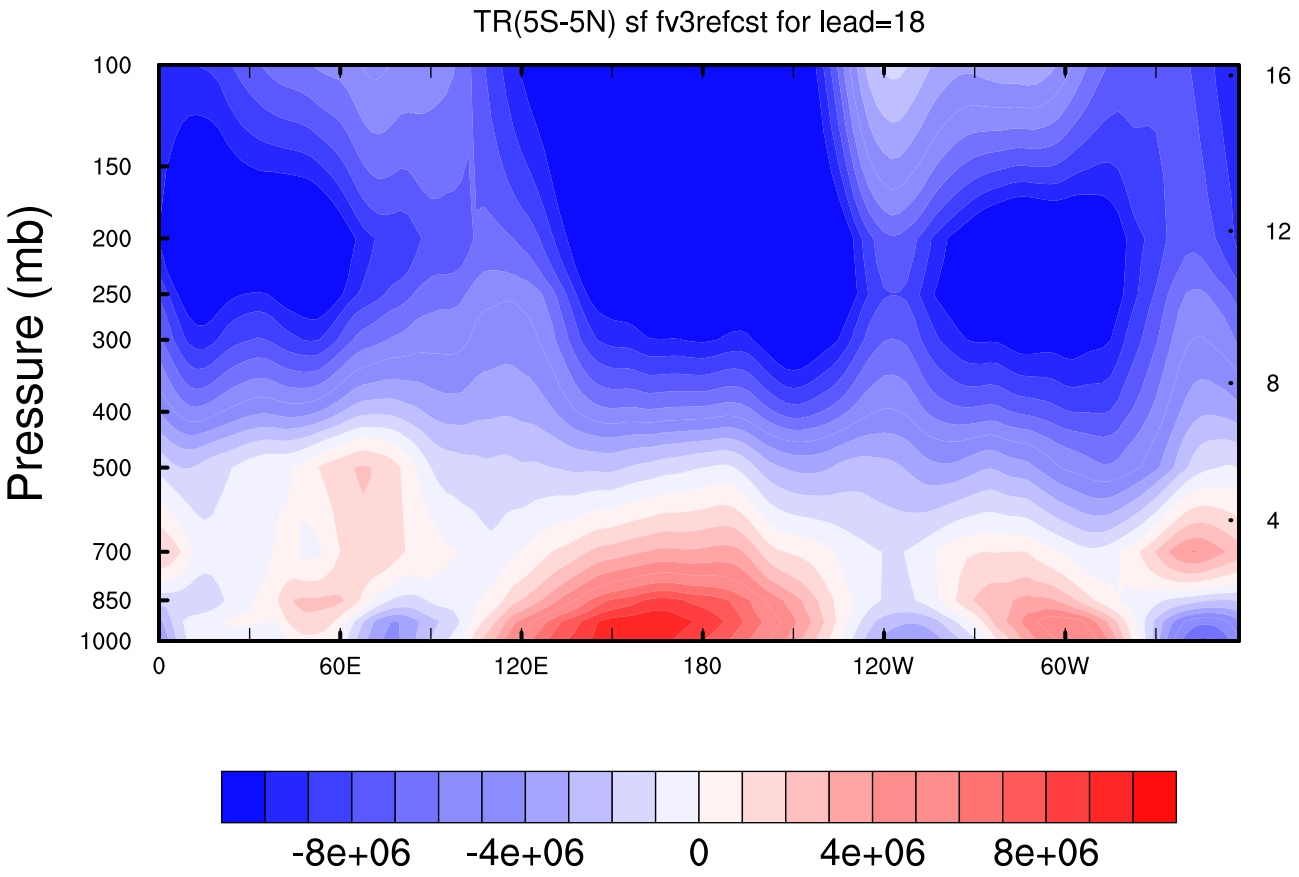
1.6e+07

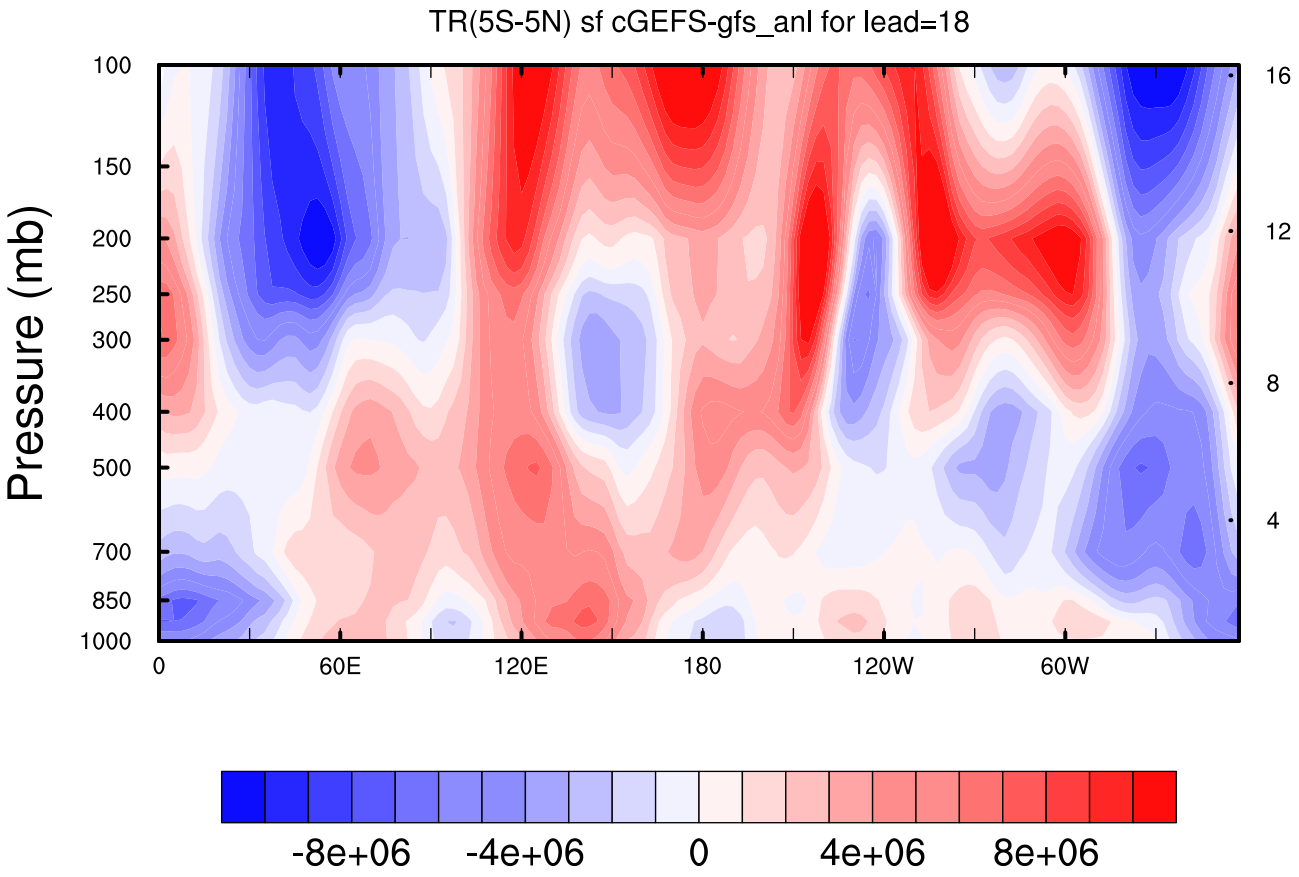

vp 200hPa cGEFS-gfs_anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

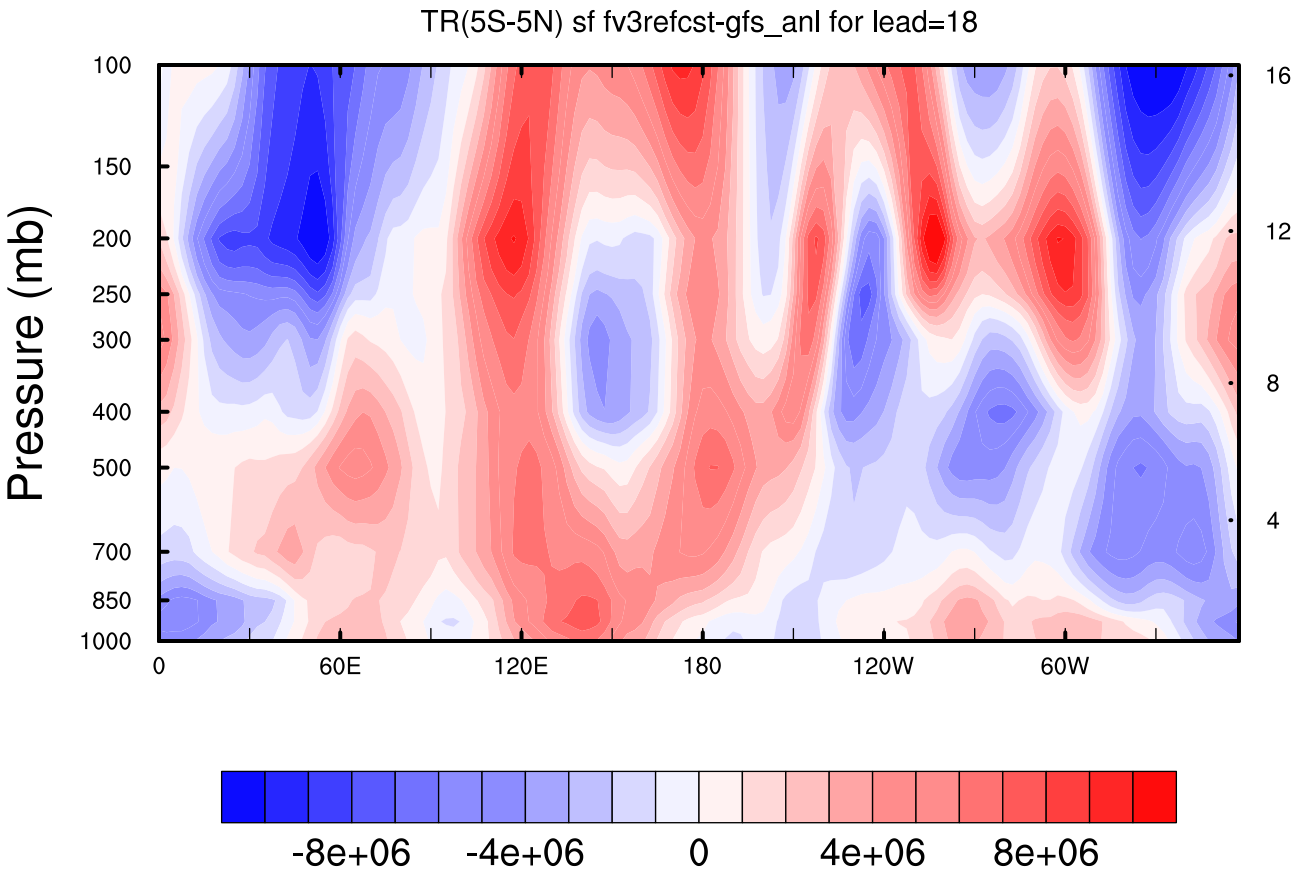

vp 200hPa fv3refcst-gfs_anl for lead=18
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

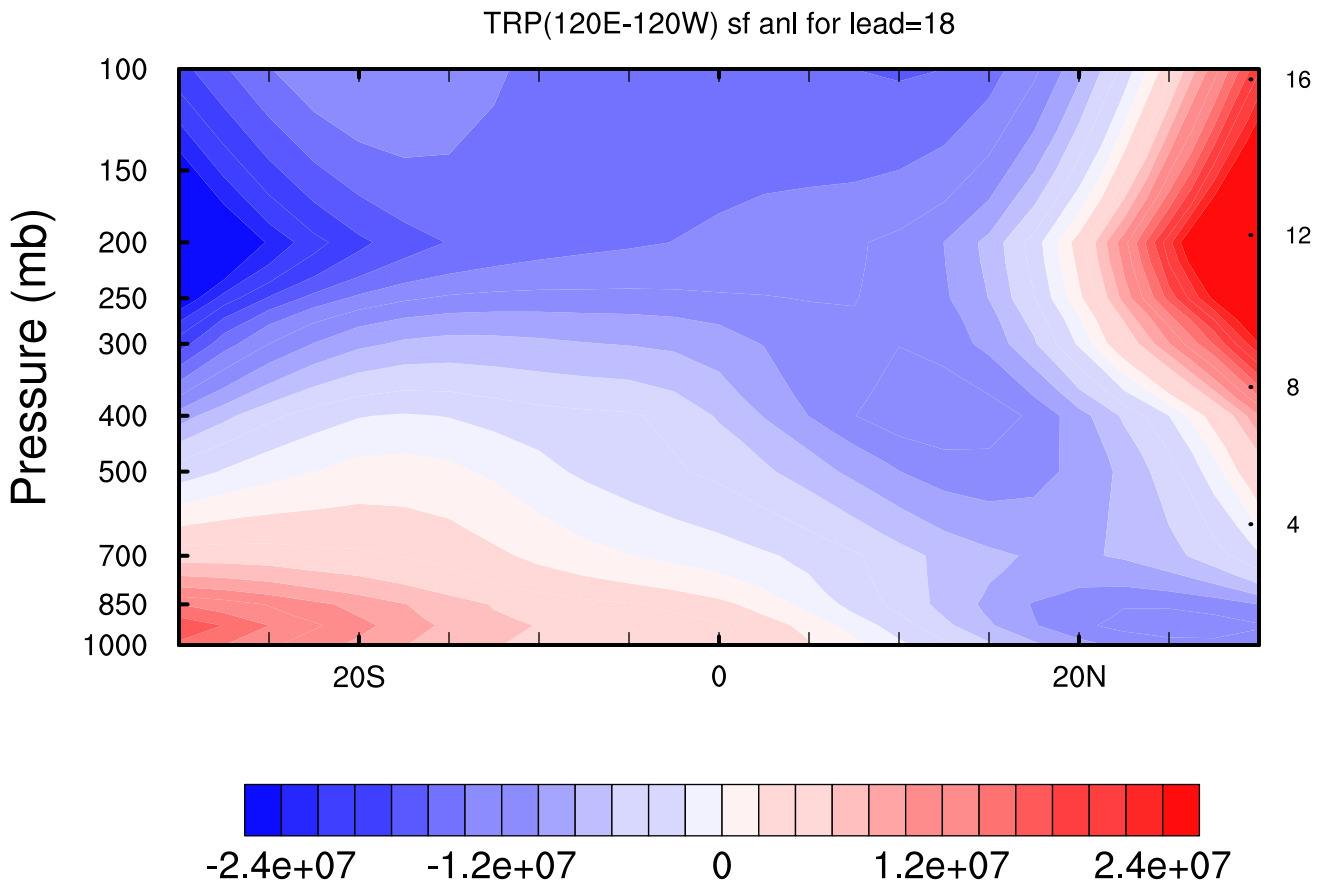

TR(5S-5N) sf anl for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

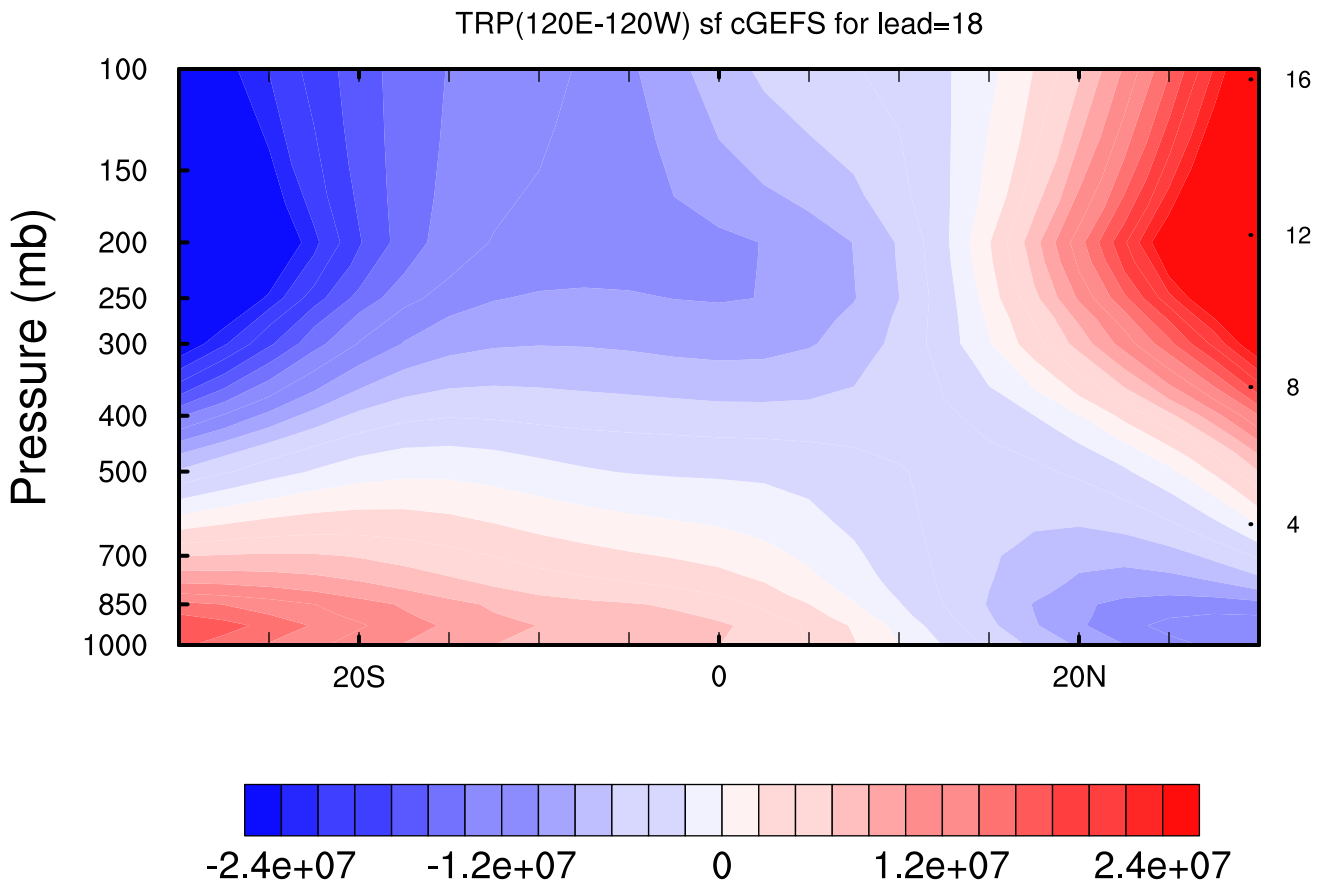

TR(5S-5N) sf cGEFS for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

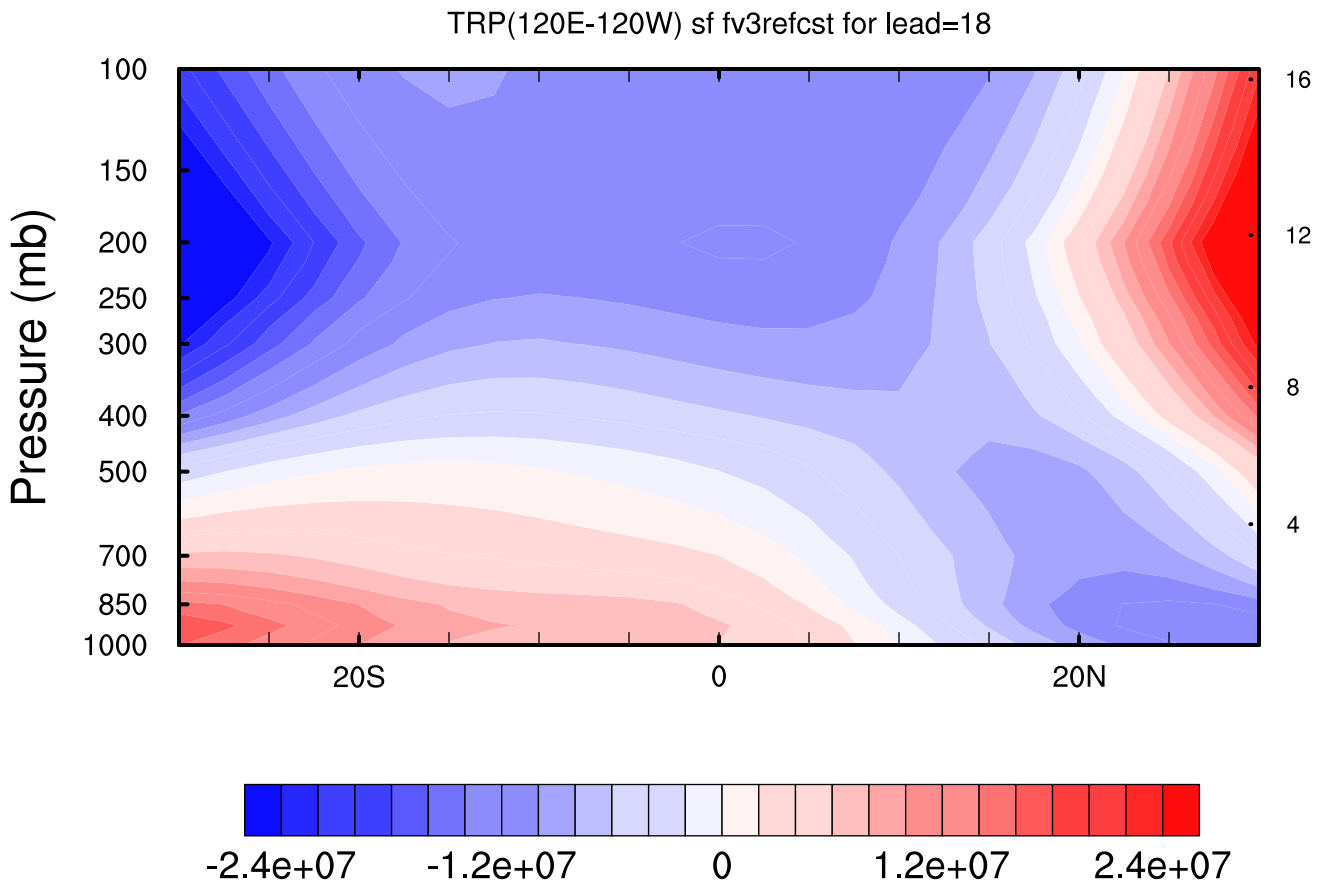

TR(5S-5N) sf fv3refcst for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

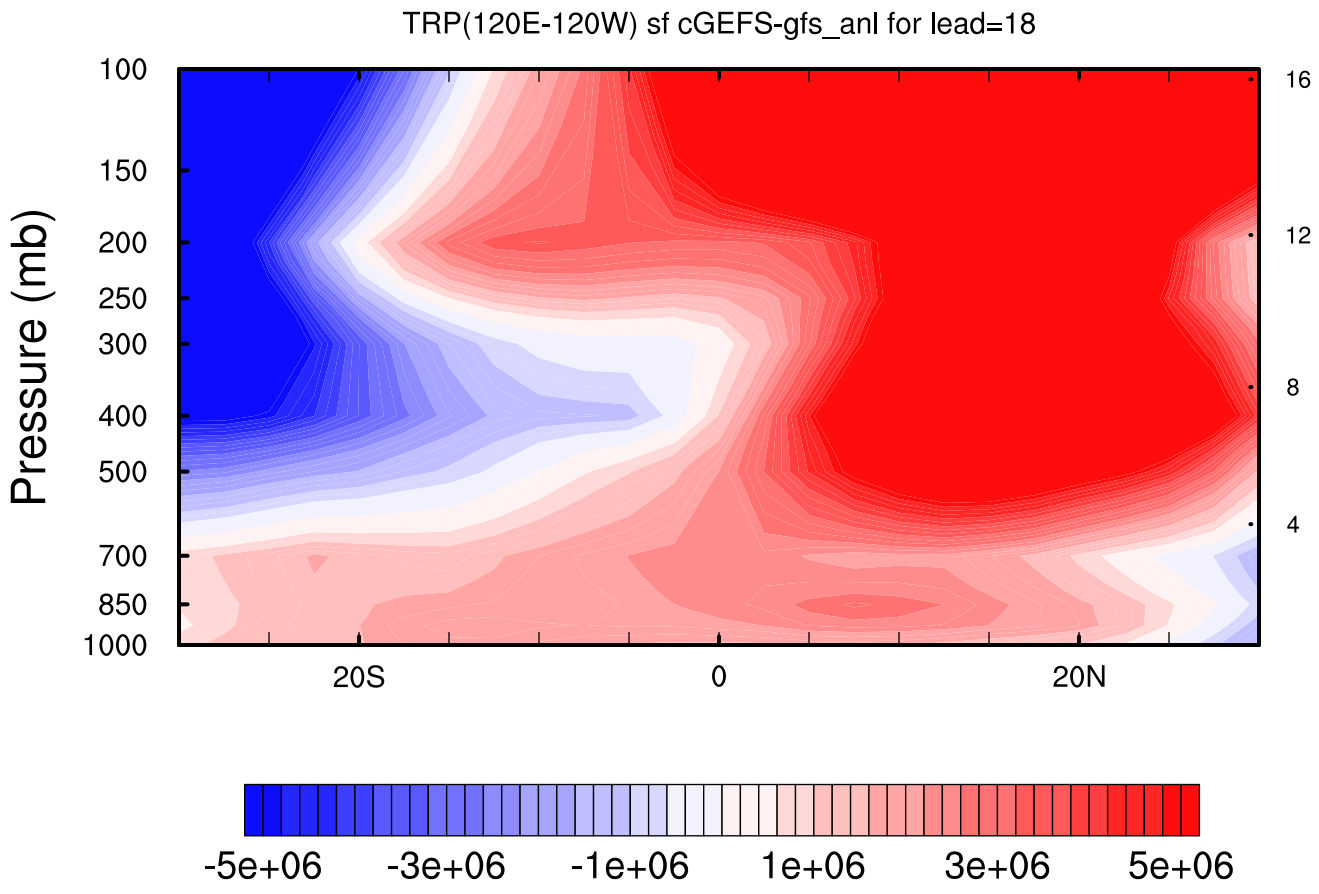

TR(5S-5N) sf cGEFS-gfs_anl for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

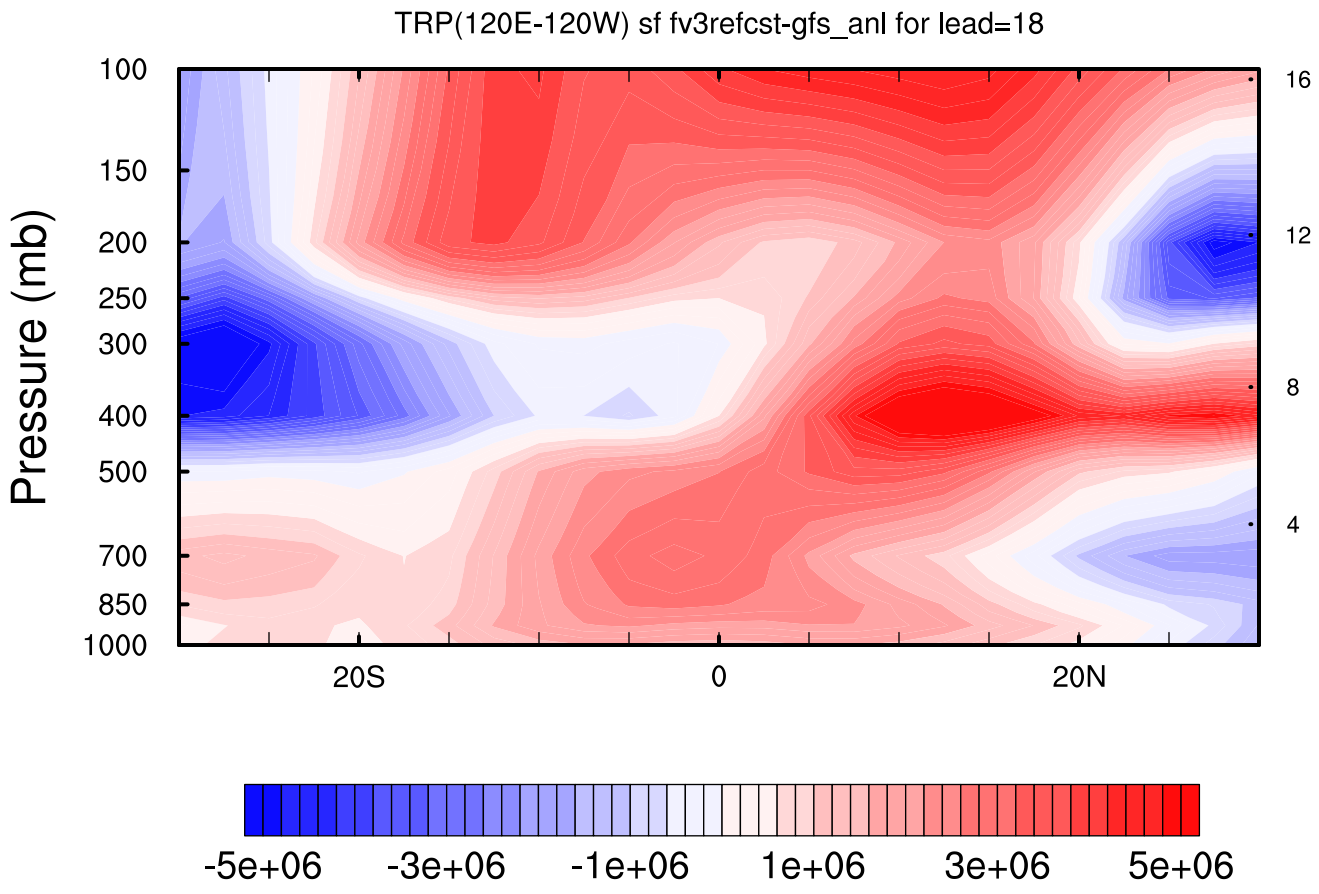

TR(5S-5N) sf fv3refcst-gfs_anl for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

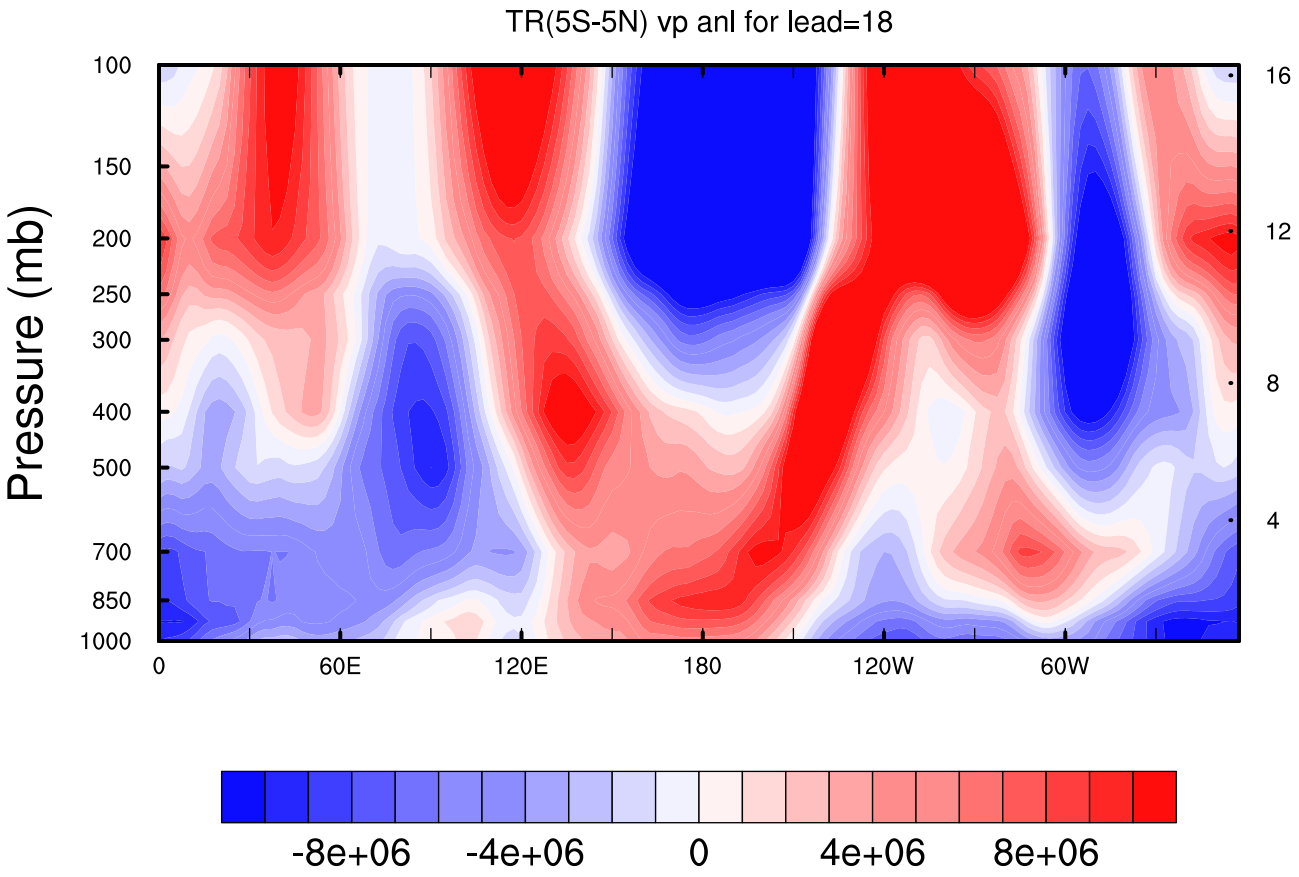

TRP(120E-120W) sf anl for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

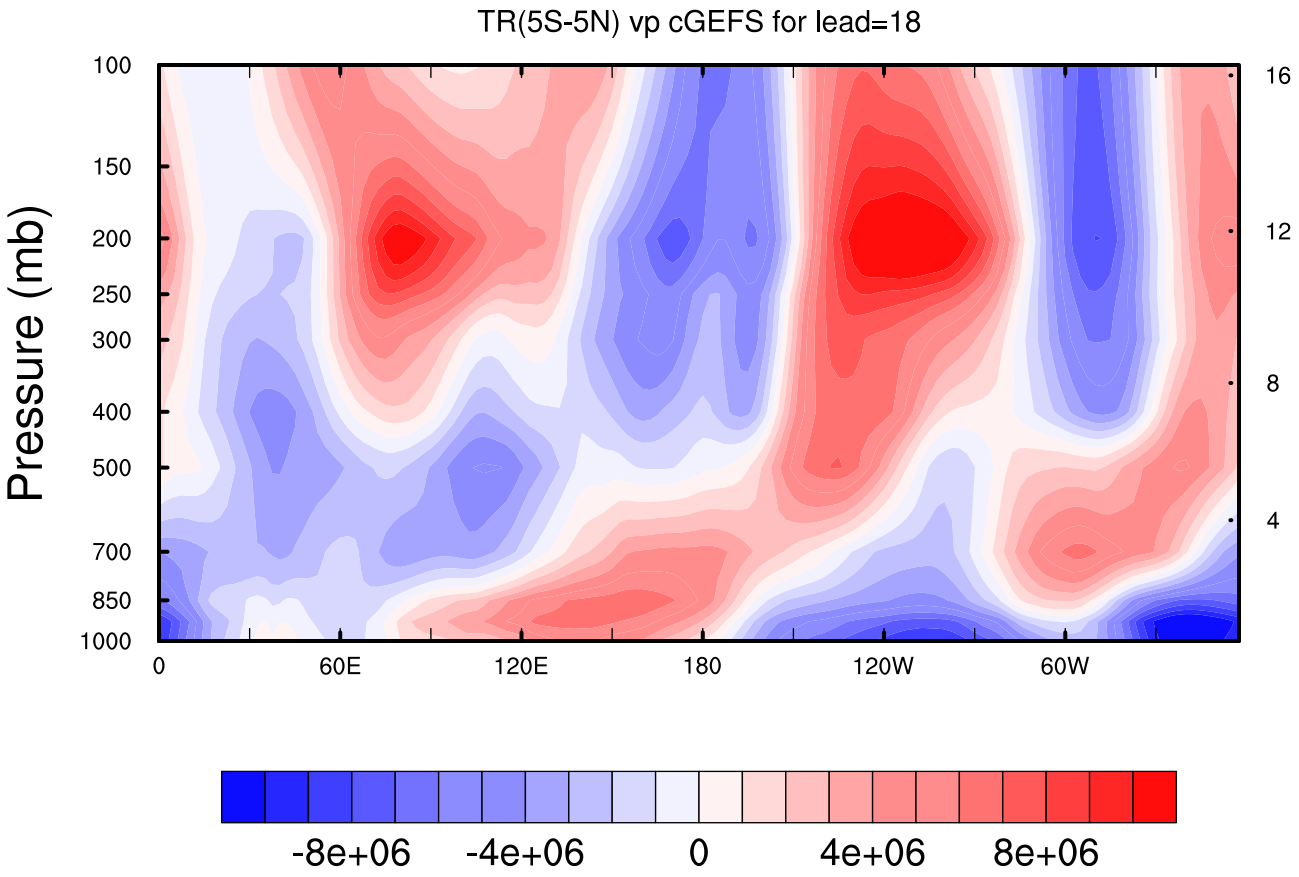

TRP(120E-120W) sf cGEFS for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

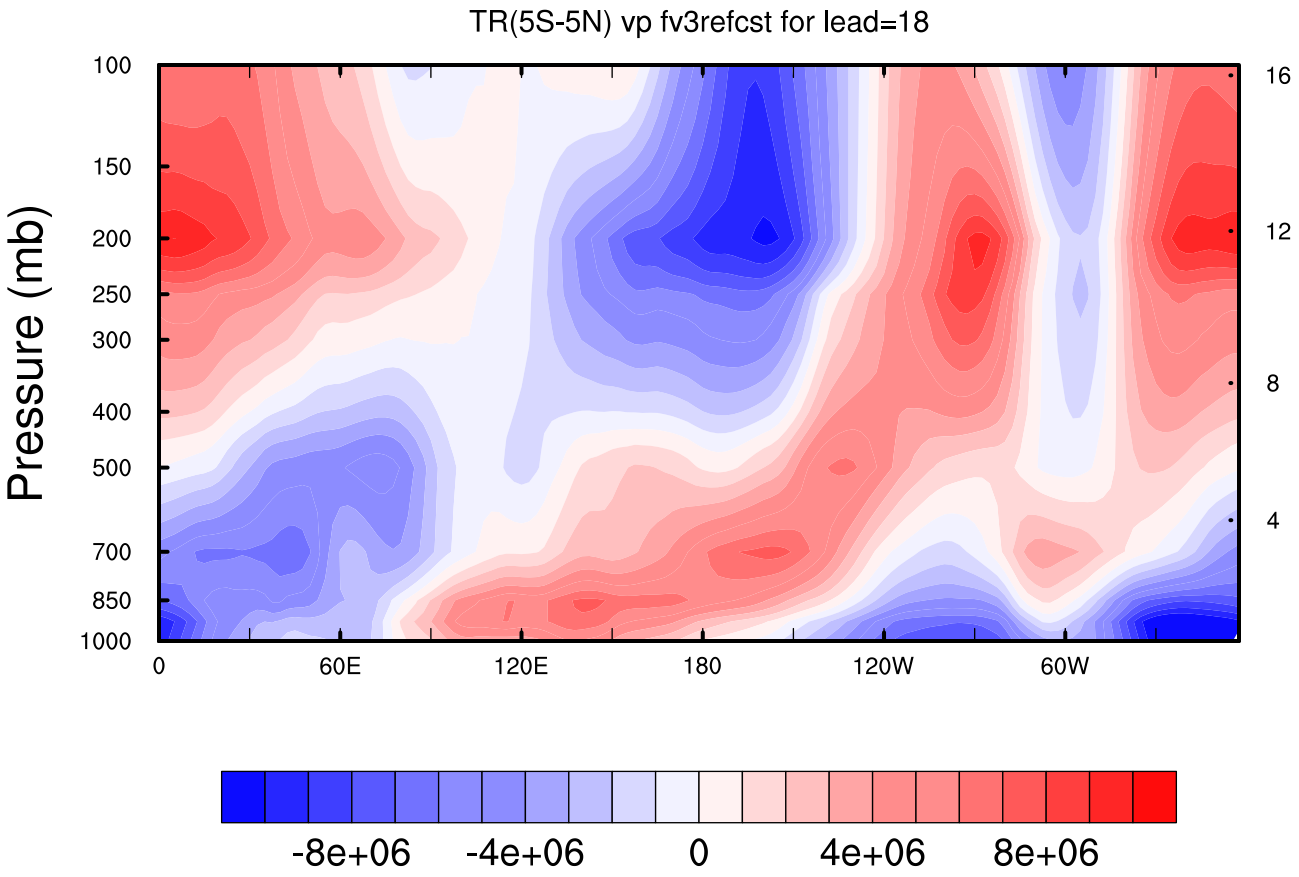

TRP(120E-120W) sf fv3refcst for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

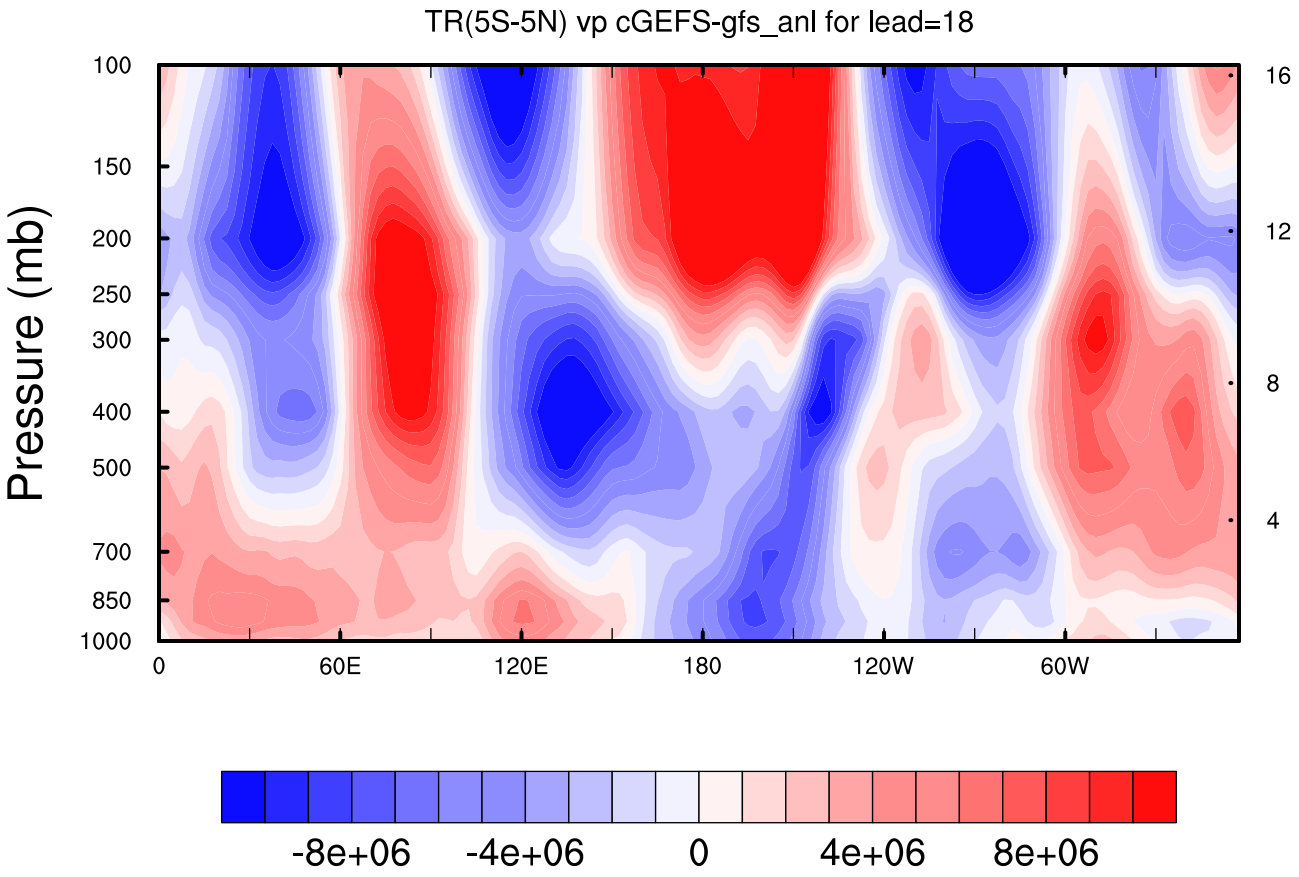

TRP(120E-120W) sf cGEFS-gfs_anl for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

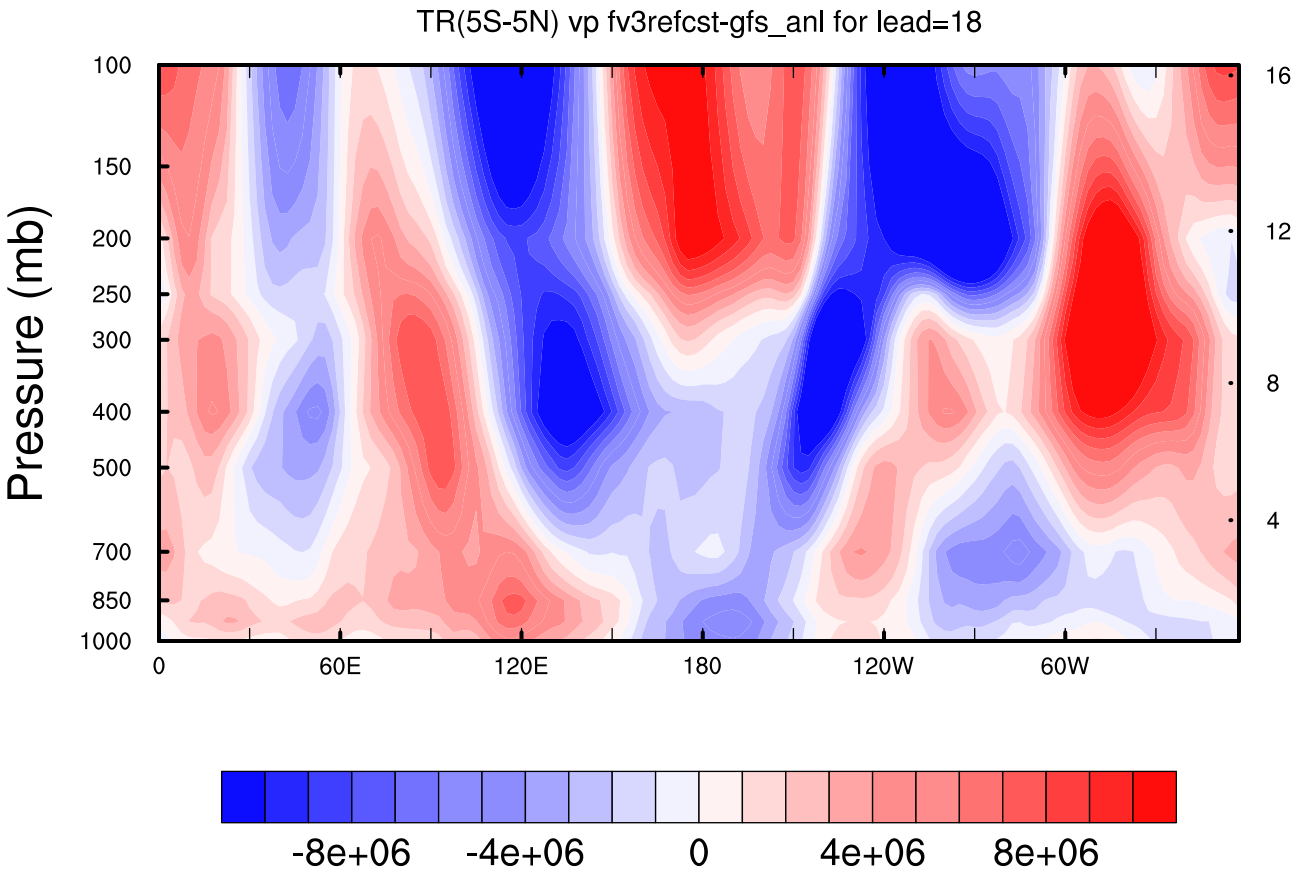

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

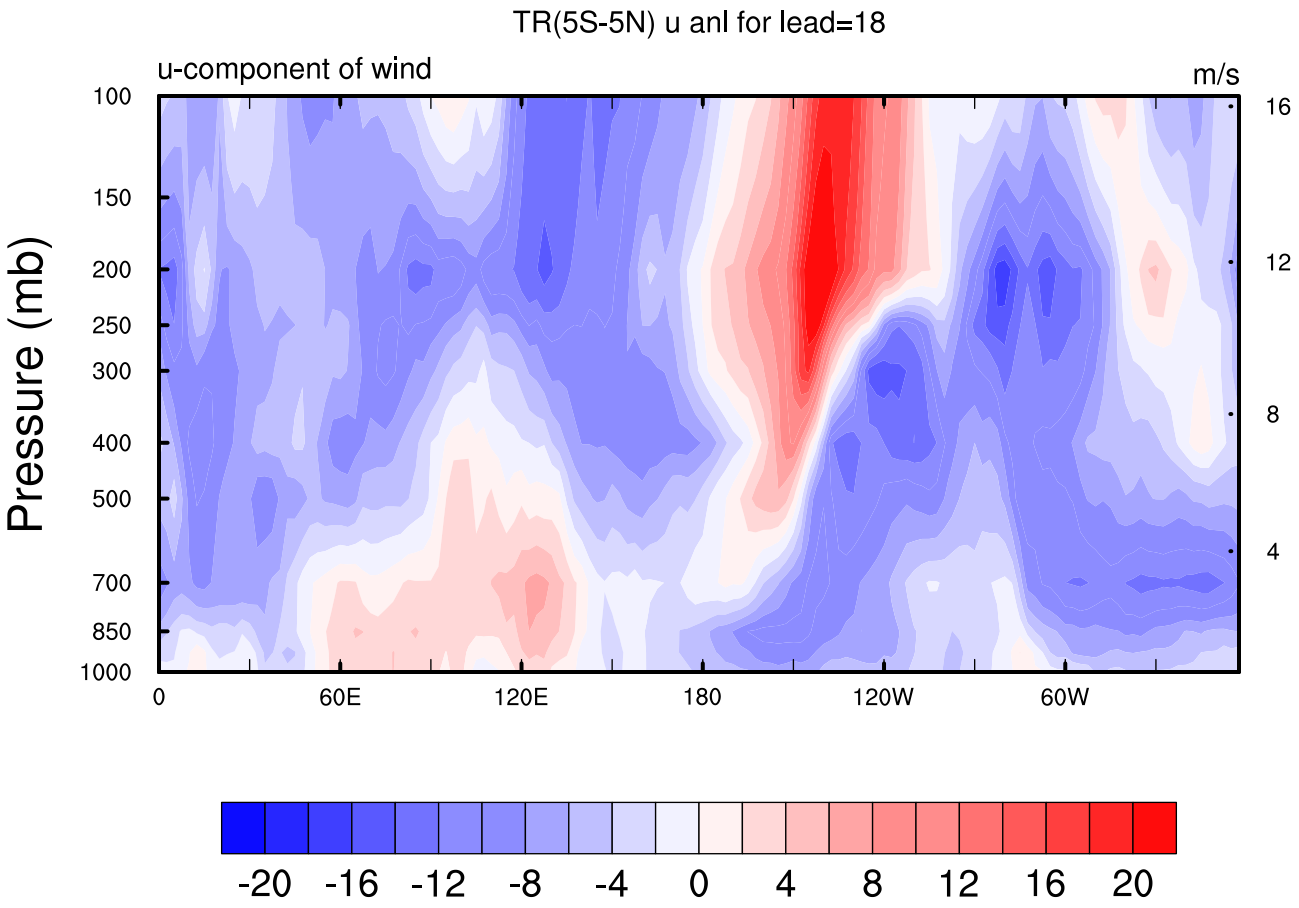

TR(5S-5N) vp anl for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

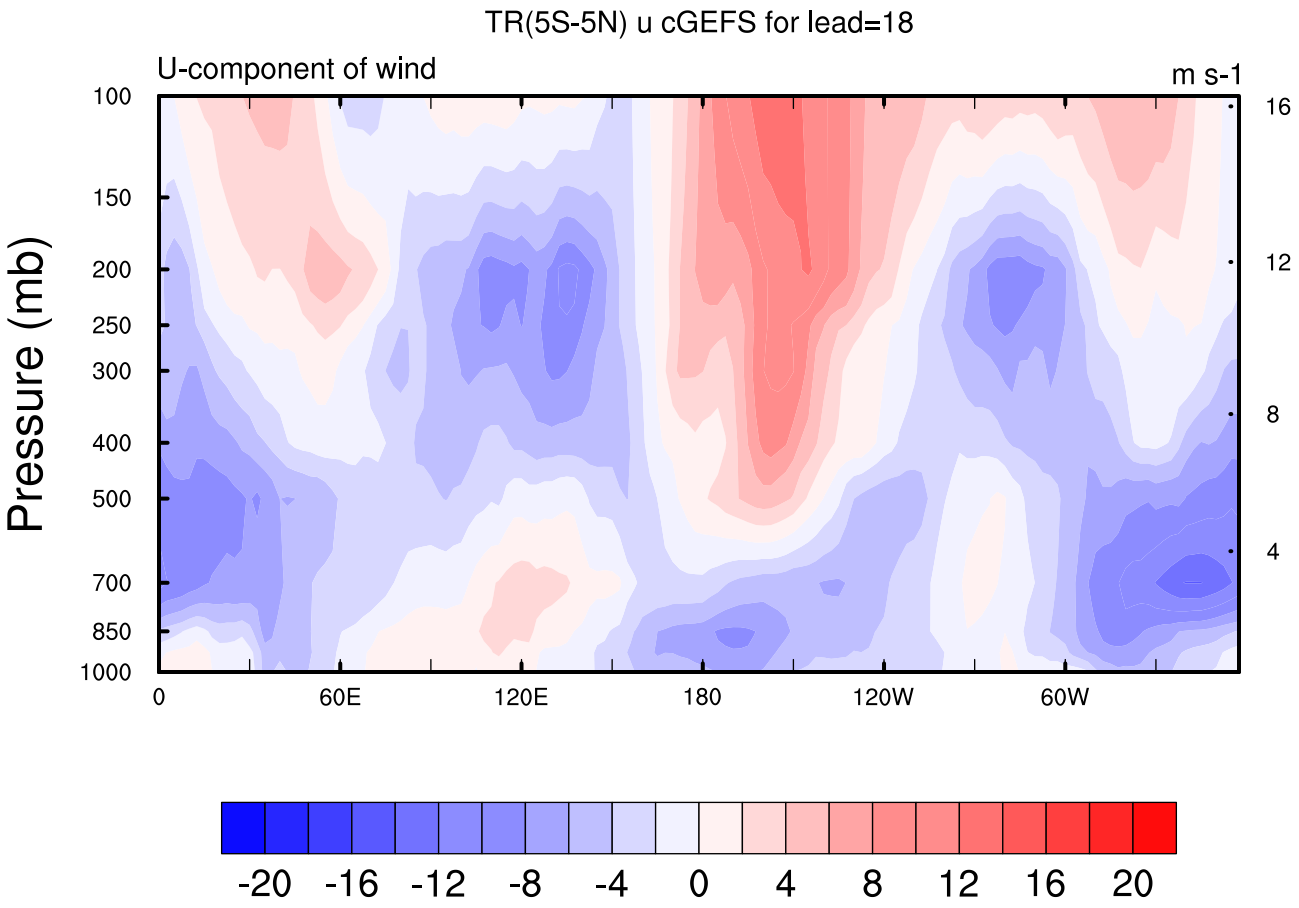

TR(5S-5N) vp cGEFS for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

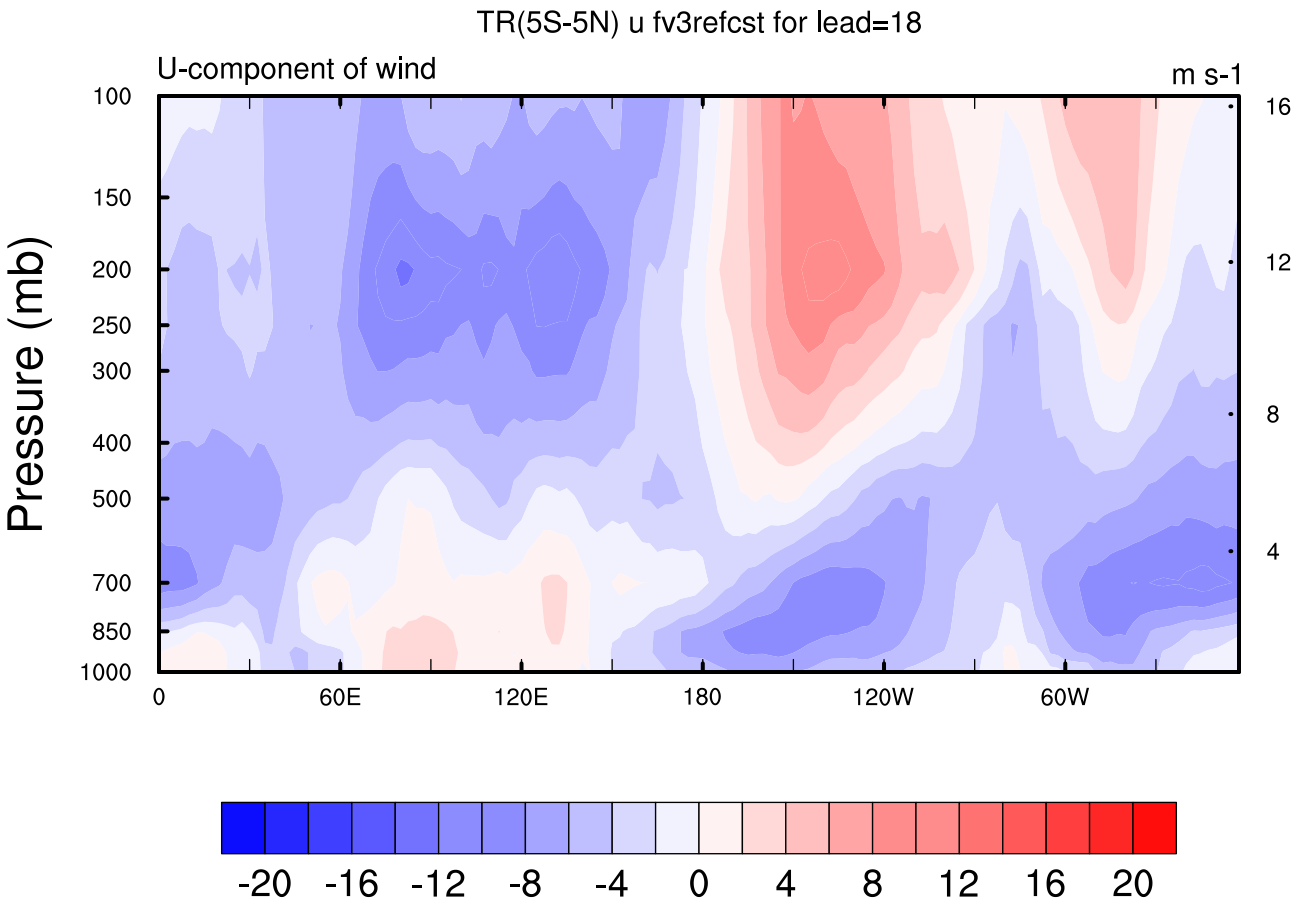

TR(5S-5N) vp fv3refcst for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

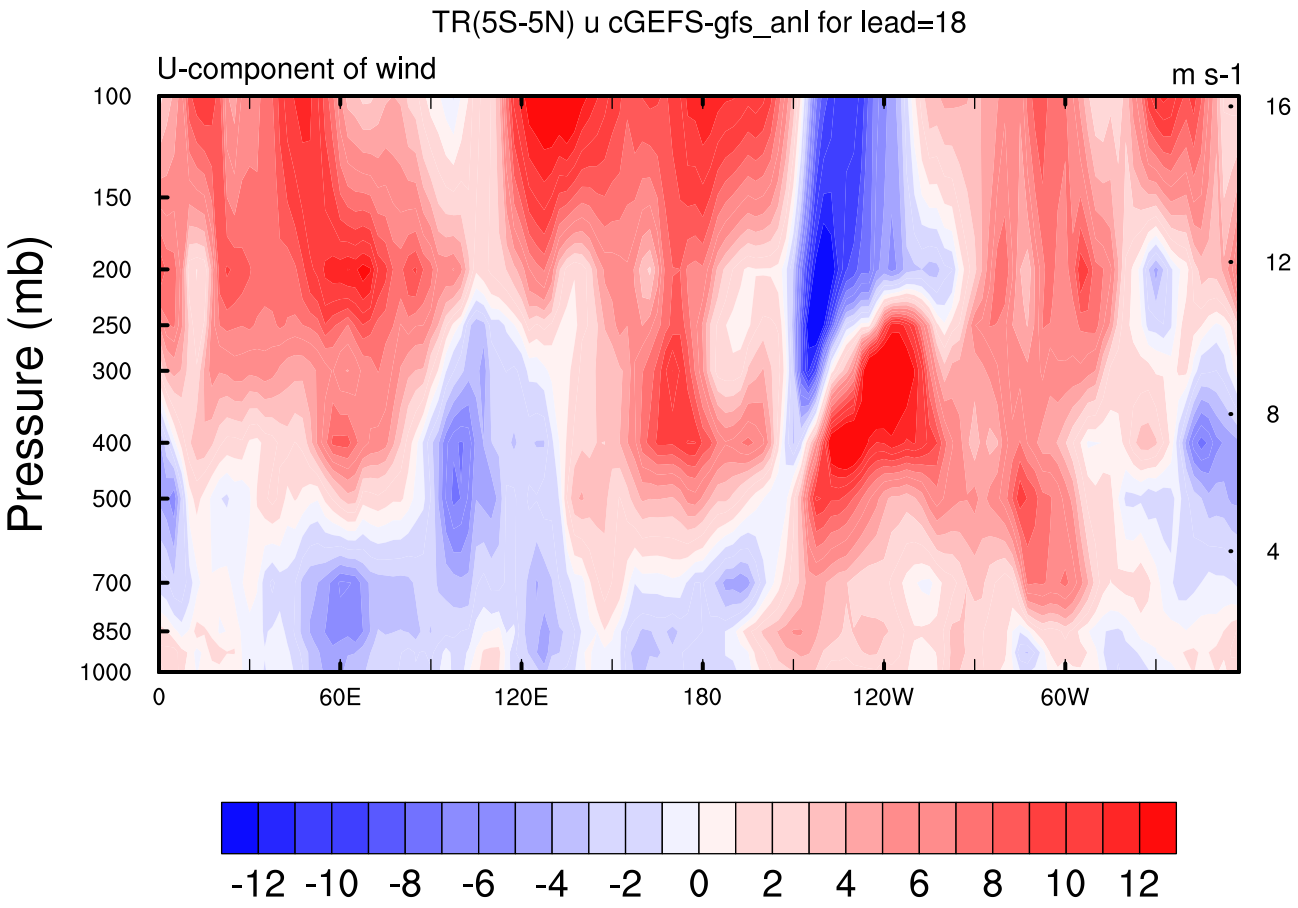

TR(5S-5N) vp cGEFS-gfs_anl for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

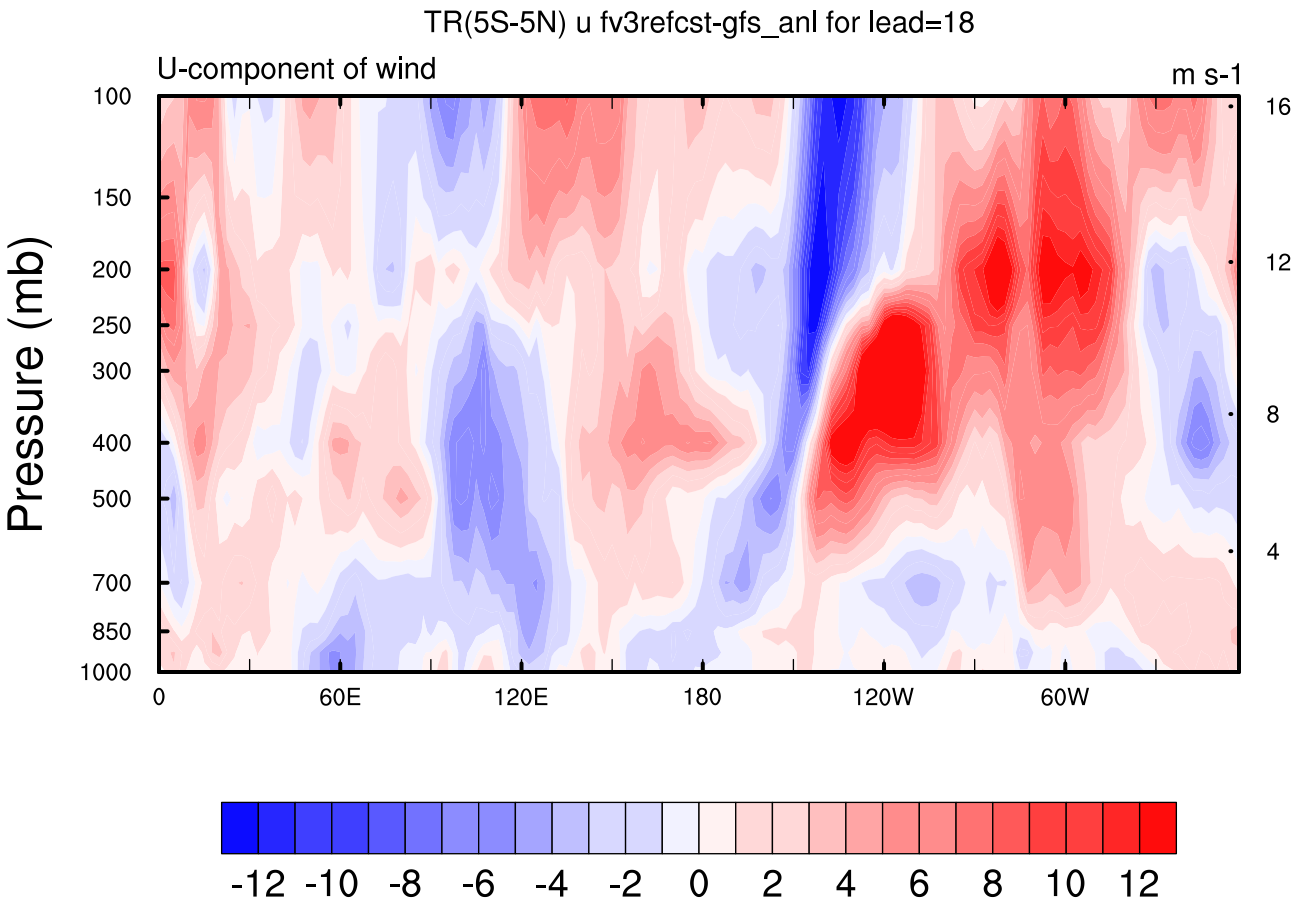

TR(5S-5N) vp fv3refcst-gfs_anl for lead=18
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

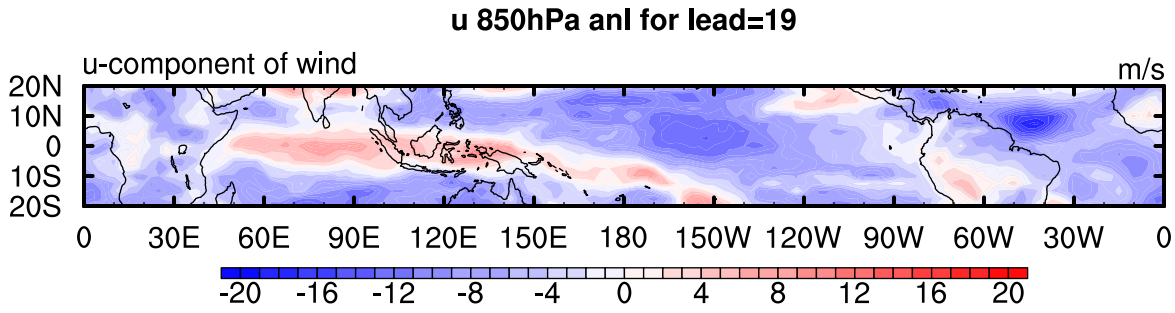

TR(5S-5N) u anl for lead=18
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

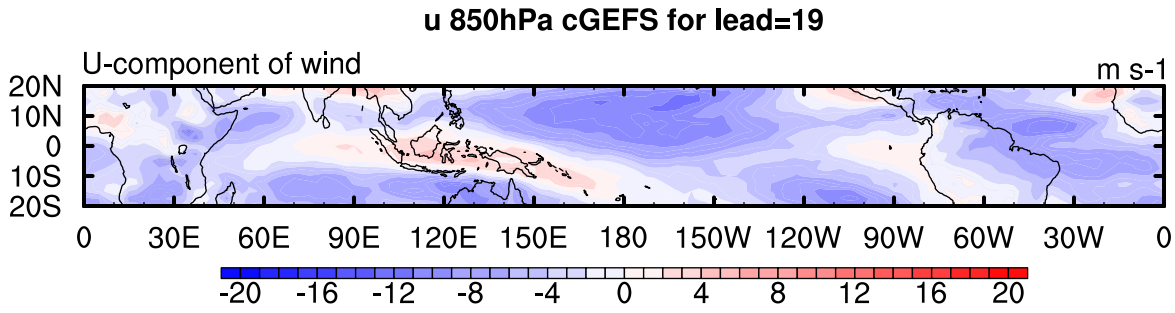

TR(5S-5N) u cGEFS for lead=18
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

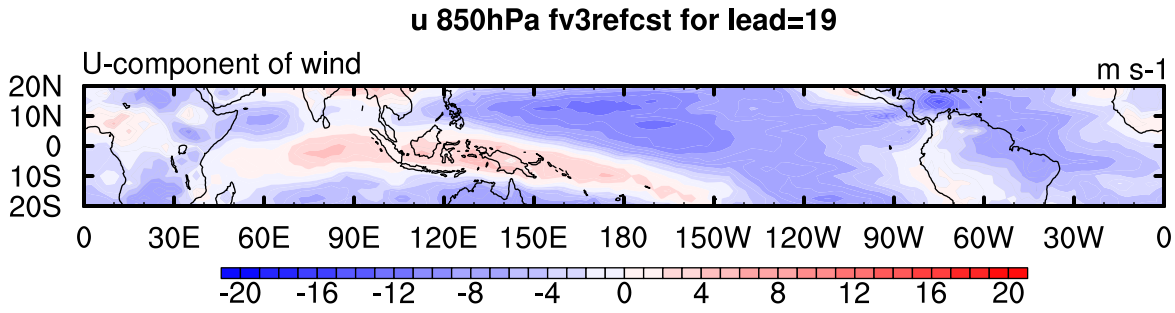

TR(5S-5N) u fv3refcst for lead=18
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

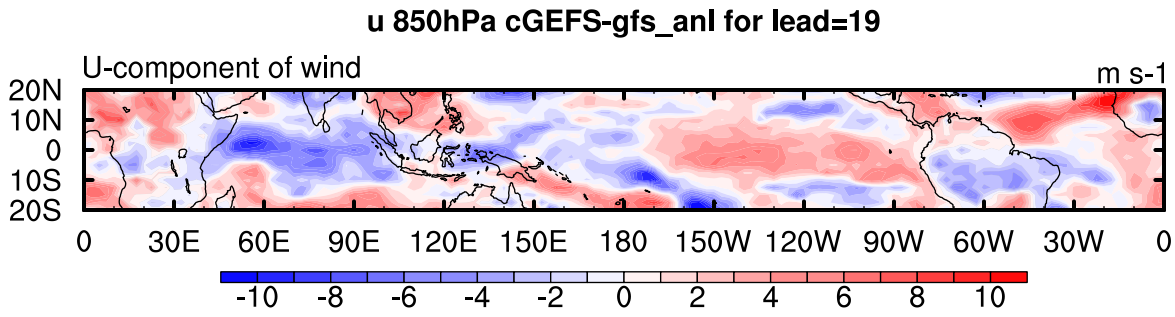

TR(5S-5N) u cGEFS-gfs_anl for lead=18
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

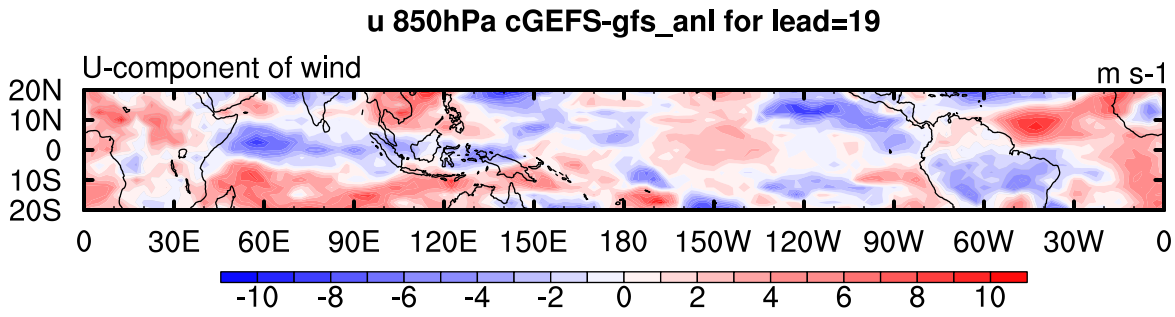

TR(5S-5N) u fv3refcst-gfs_anl for lead=18
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

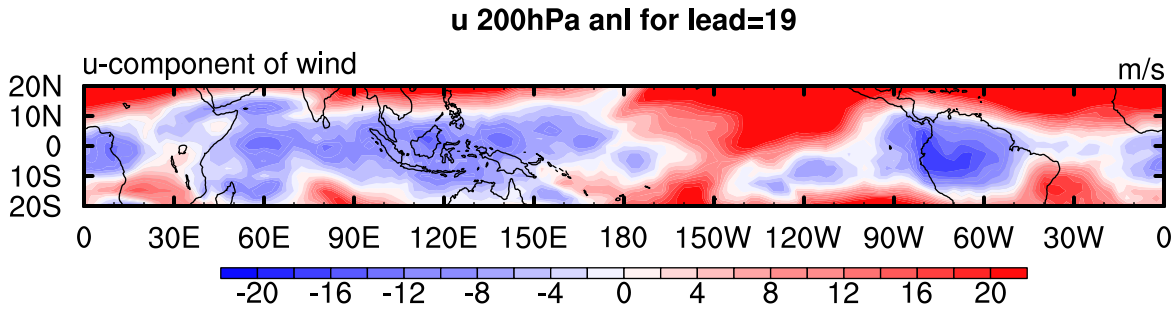

u 850hPa anl for lead=19
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

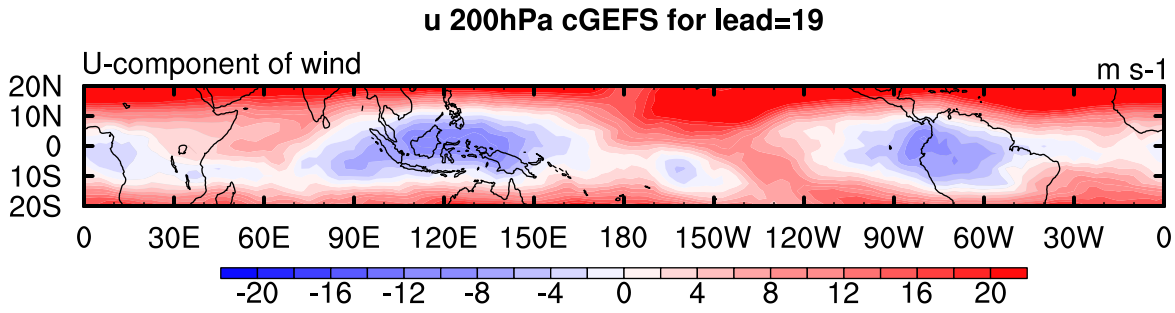

u 850hPa cGEFS for lead=19
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

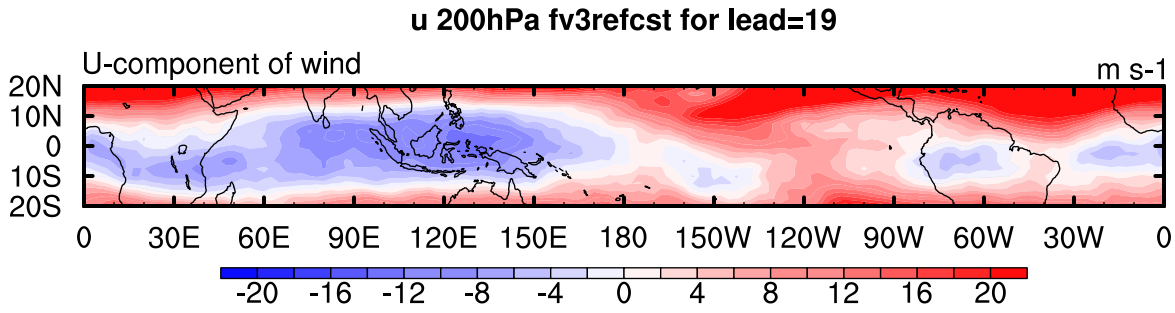

u 850hPa fv3refcst for lead=19
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

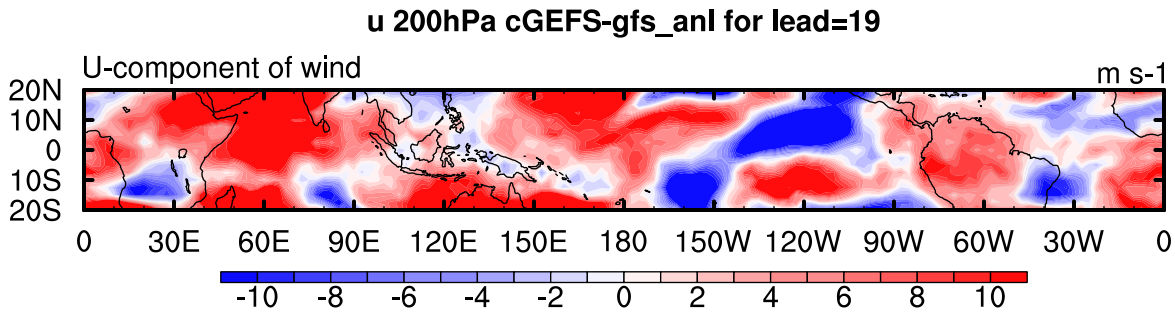

u 850hPa cGEFS-gfs_anl for lead=19
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

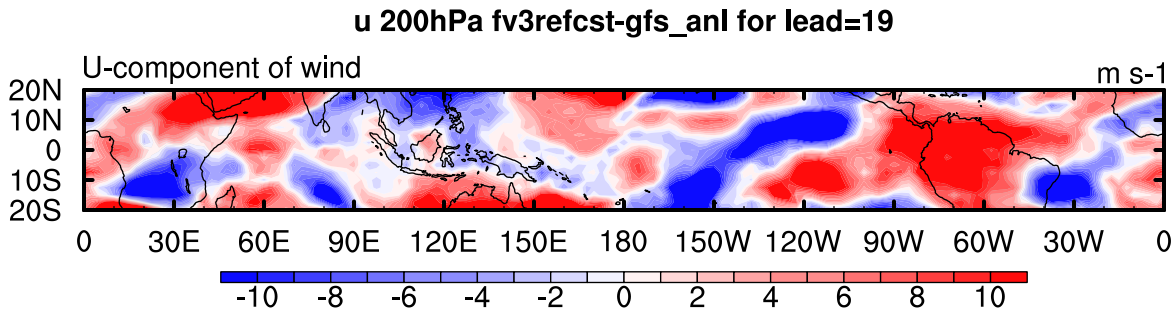

u 850hPa cGEFS-gfs_anl for lead=19
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=19
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=19
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=19
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=19
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=19
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
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-4
-2
0
2
4
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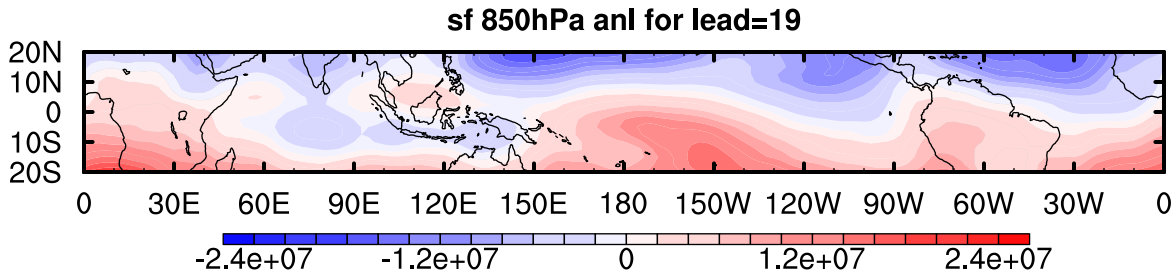
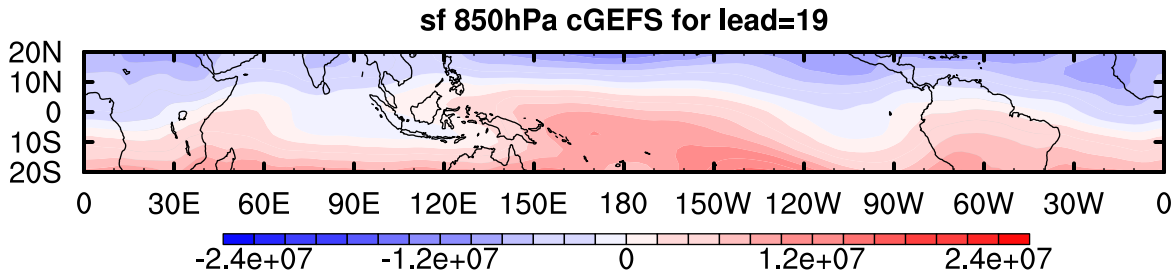
8
10


sf 850hPa anl for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
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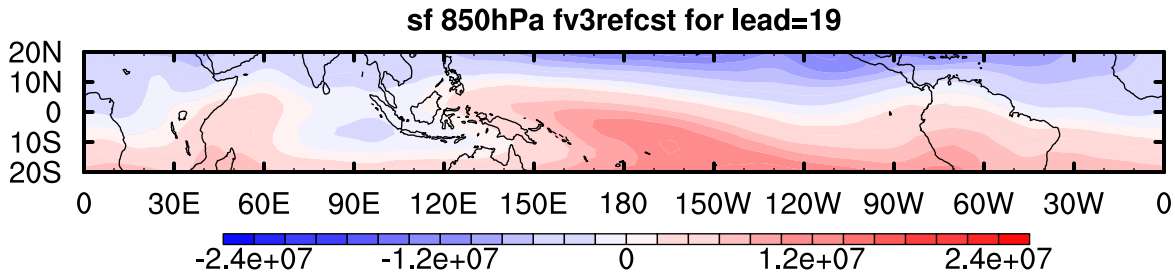
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
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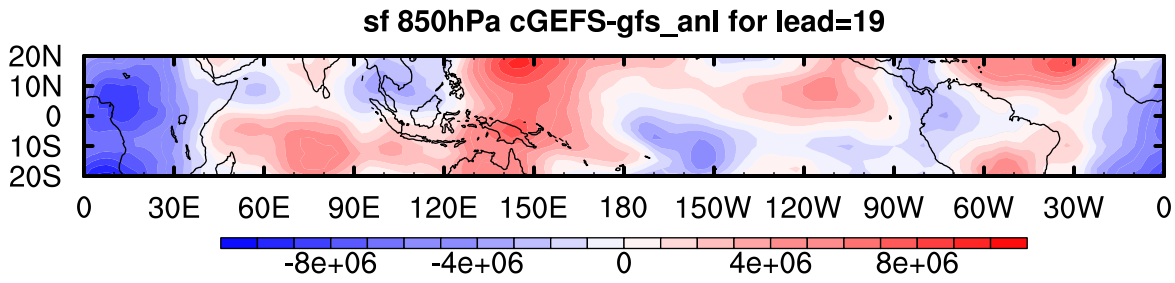
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-4e+06
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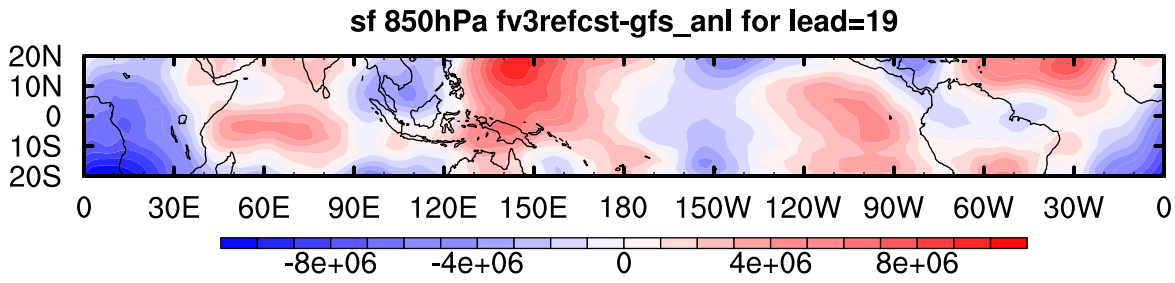
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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180
150W
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30W
0
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-4e+06
0
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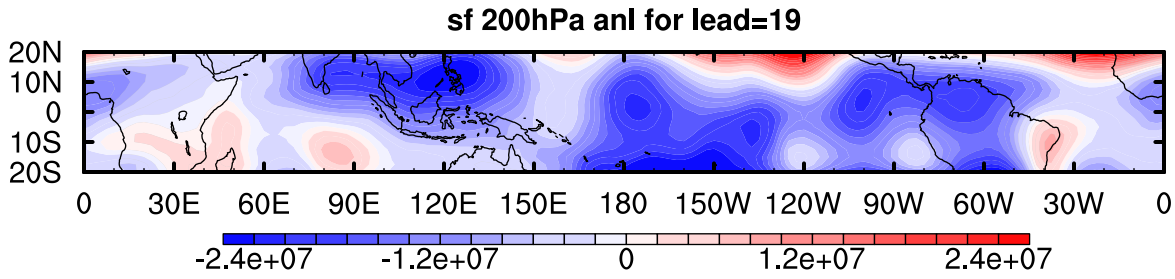
8e+06


sf 200hPa anl for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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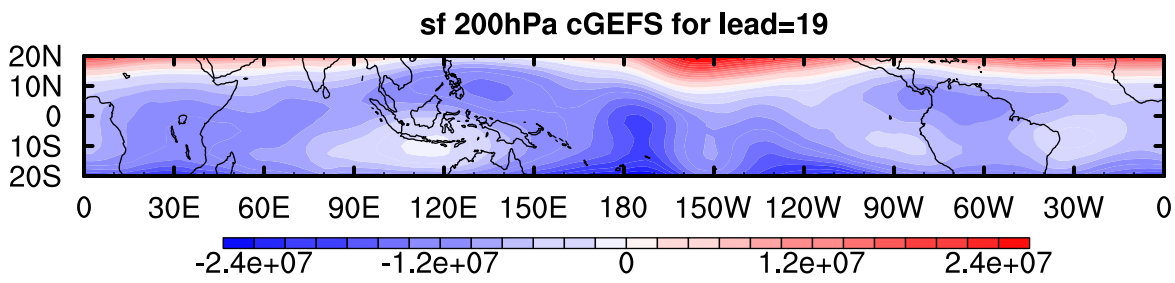
sf 200hPa cGEFS for lead=19
20N
10N
0
10S
20S
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30E
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90E
120E
150E
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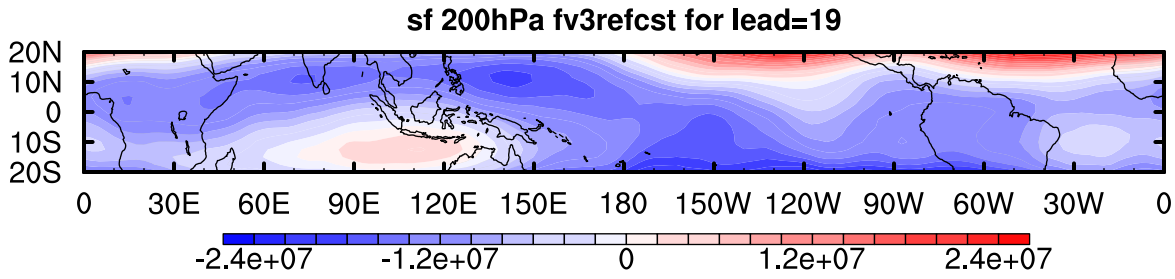
sf 200hPa fv3refcst for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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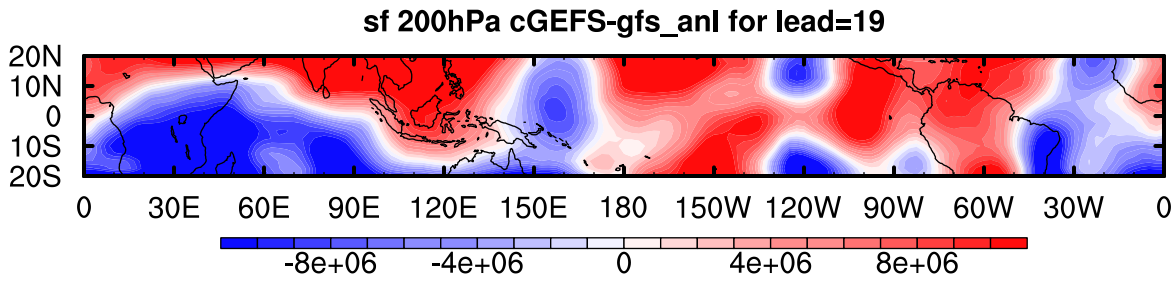
sf 200hPa cGEFS-gfs_anl for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
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90W
60W
30W
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-4e+06
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4e+06
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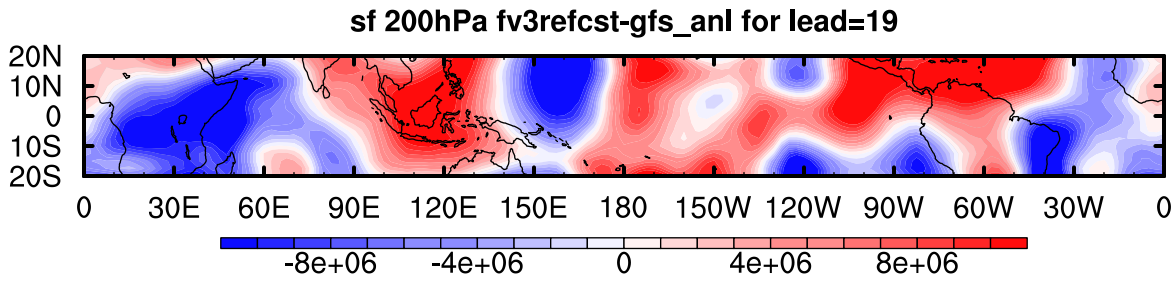
sf 200hPa fv3refcst-gfs_anl for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
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150E
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150W
120W
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30W
0
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-4e+06
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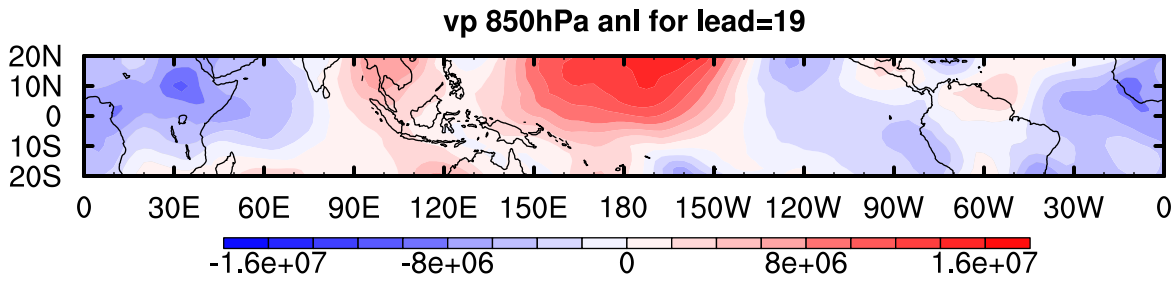
8e+06


vp 850hPa anl for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
60W
30W
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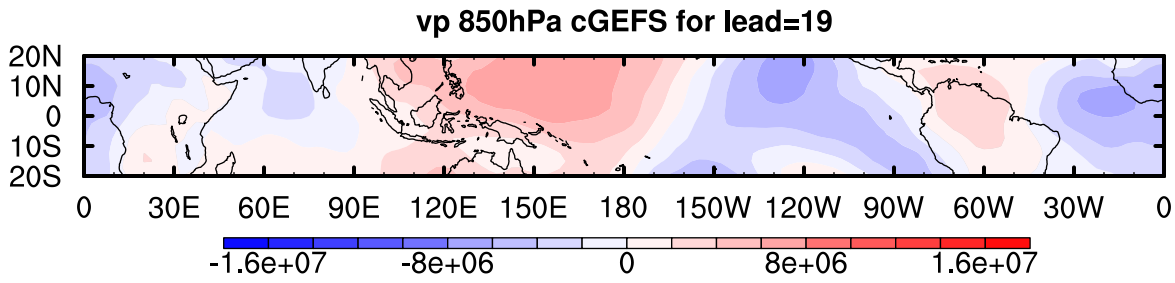
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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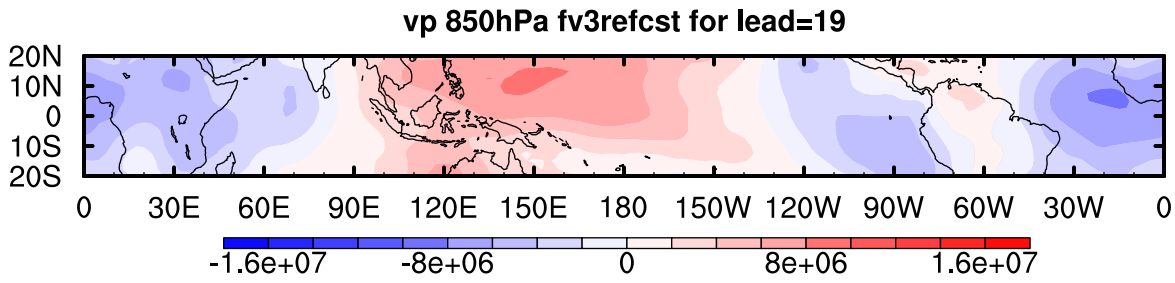
1.6e+07


vp 850hPa fv3refcst for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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60W
30W
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-1.6e+07
-8e+06
0
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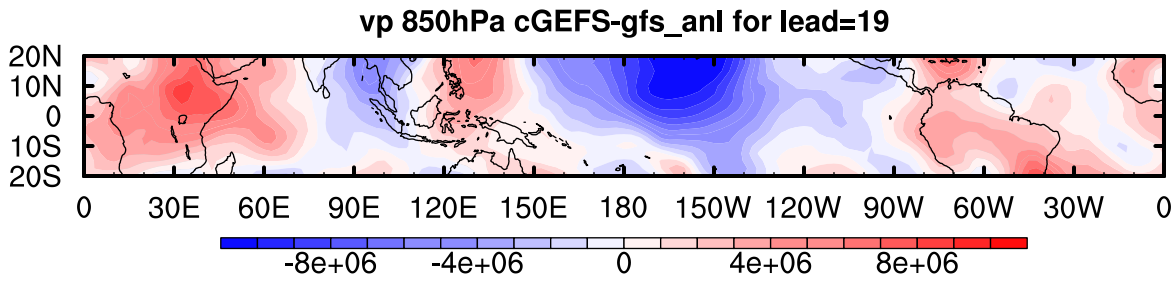
vp 850hPa cGEFS-gfs_anl for lead=19
20N
10N
0
10S
20S
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30E
60E
90E
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90W
60W
30W
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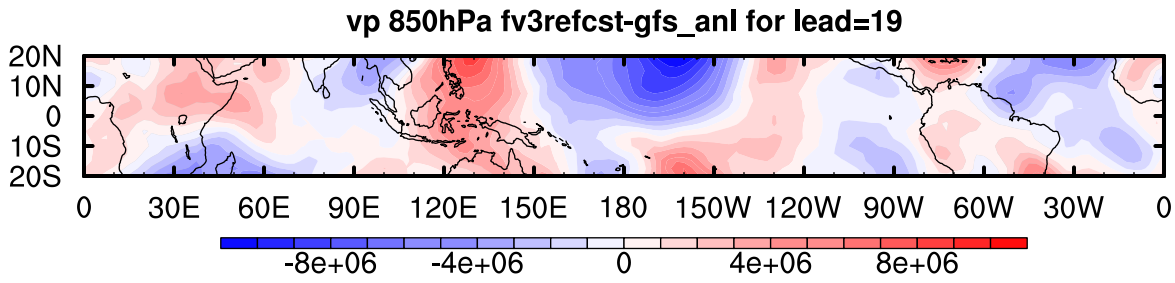
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=19
20N
10N
0
10S
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-4e+06
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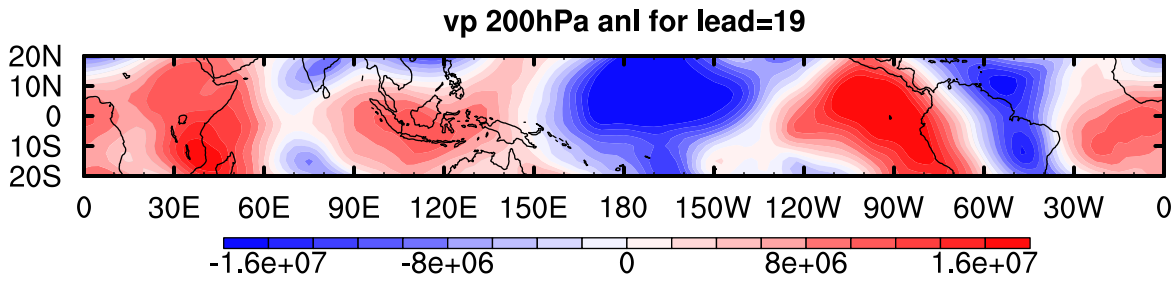
8e+06


vp 200hPa anl for lead=19
20N
10N
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10S
20S
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120E
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60W
30W
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-8e+06
0
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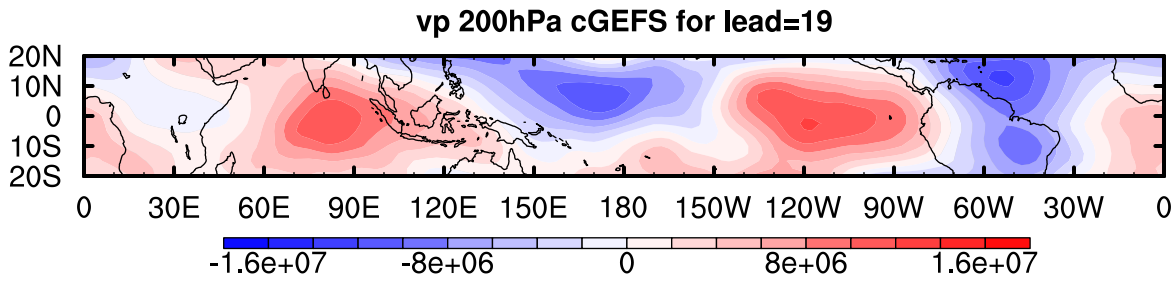
1.6e+07


vp 200hPa cGEFS for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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90W
60W
30W
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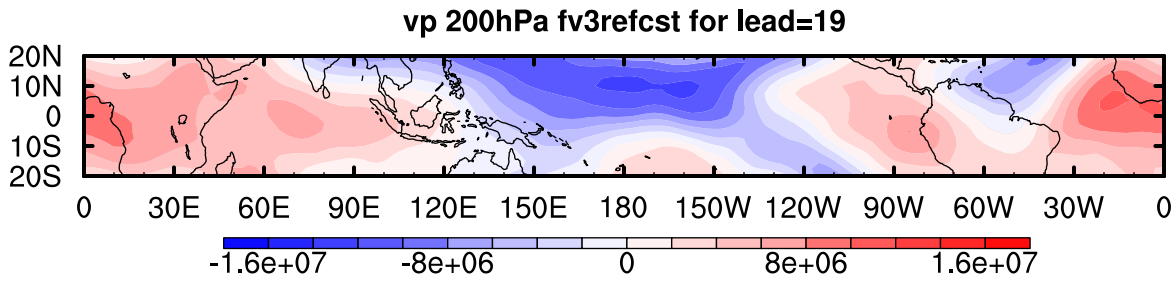
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa fv3refcst for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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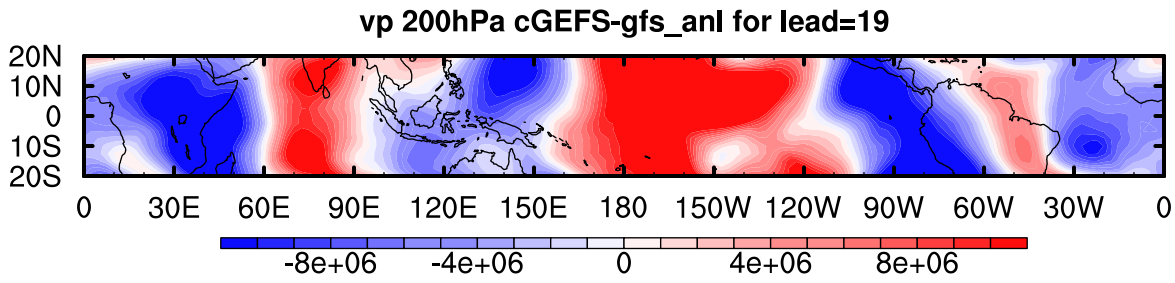
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa cGEFS-gfs_anl for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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120W
90W
60W
30W
0
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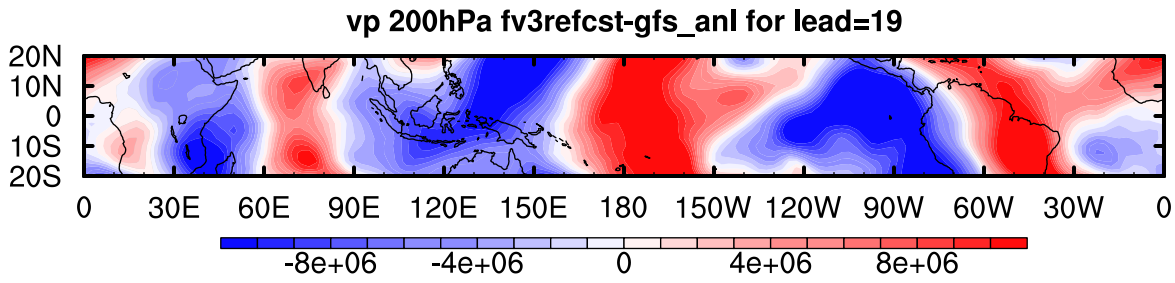
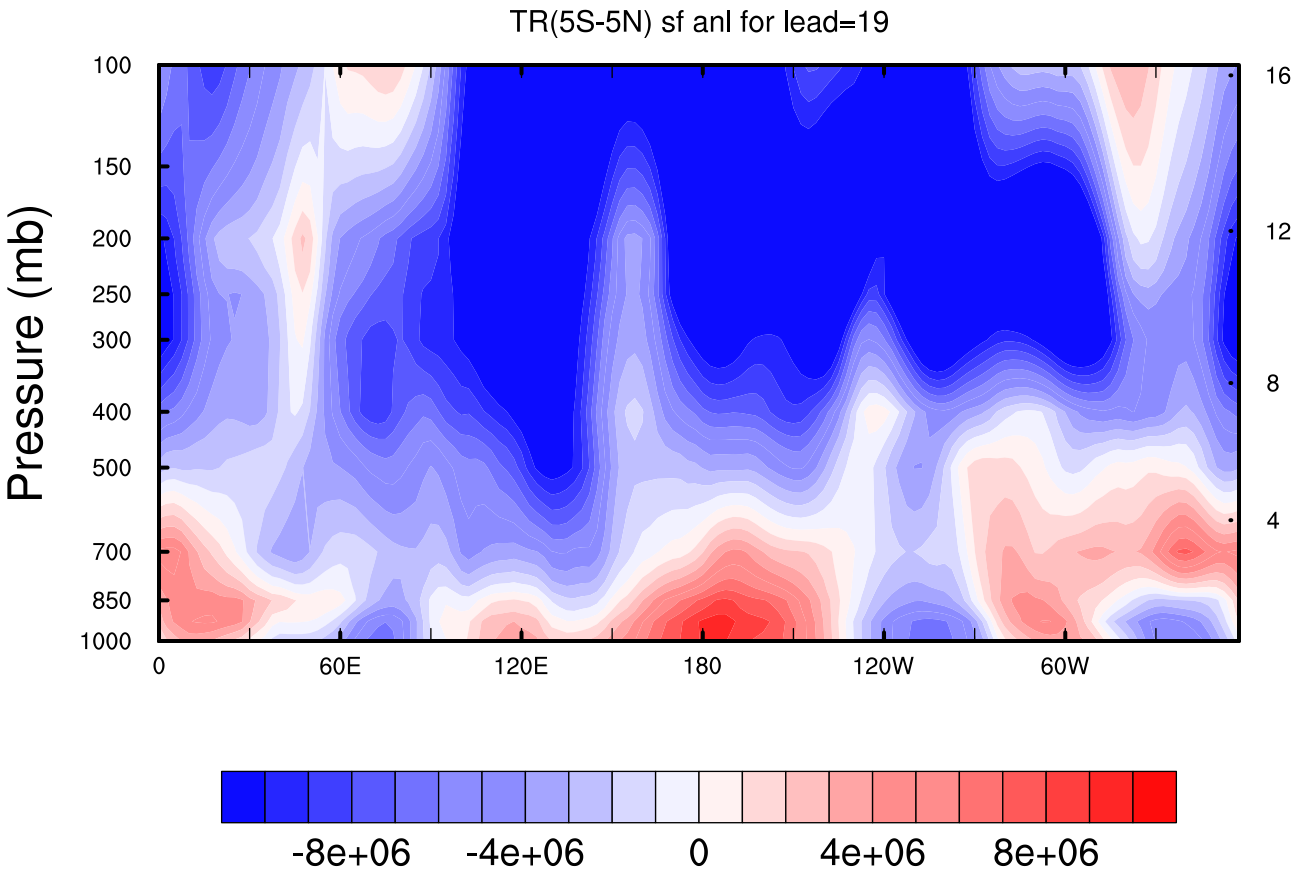
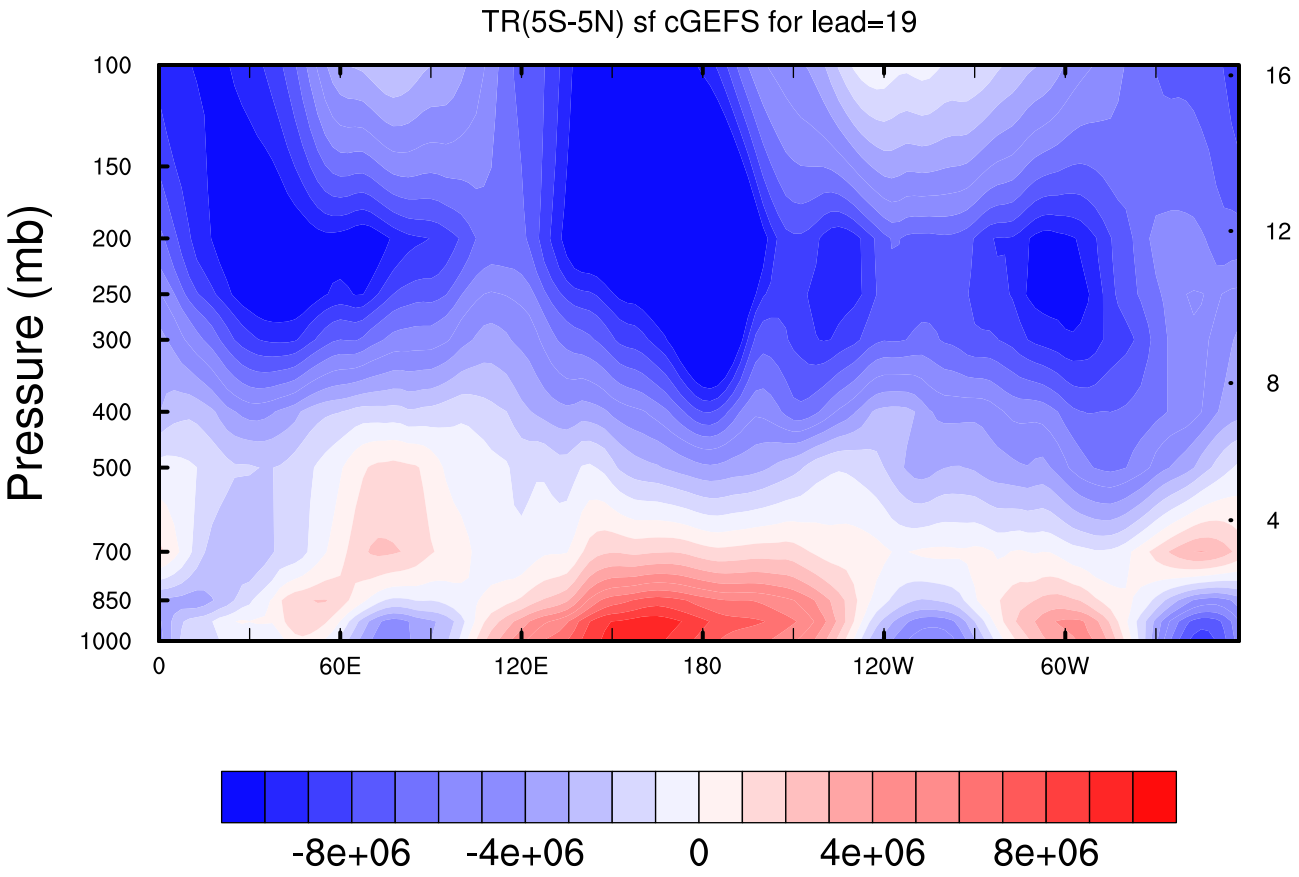
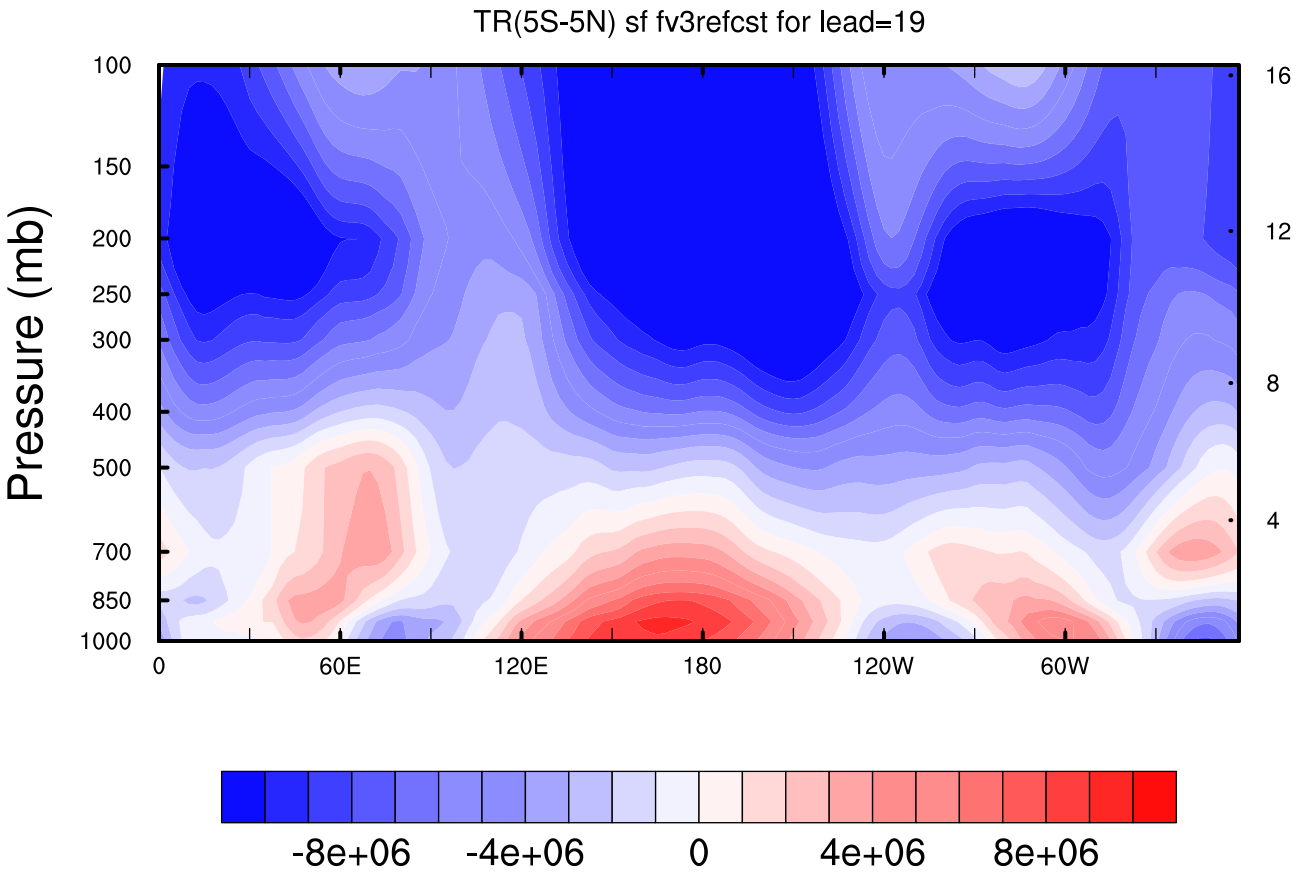
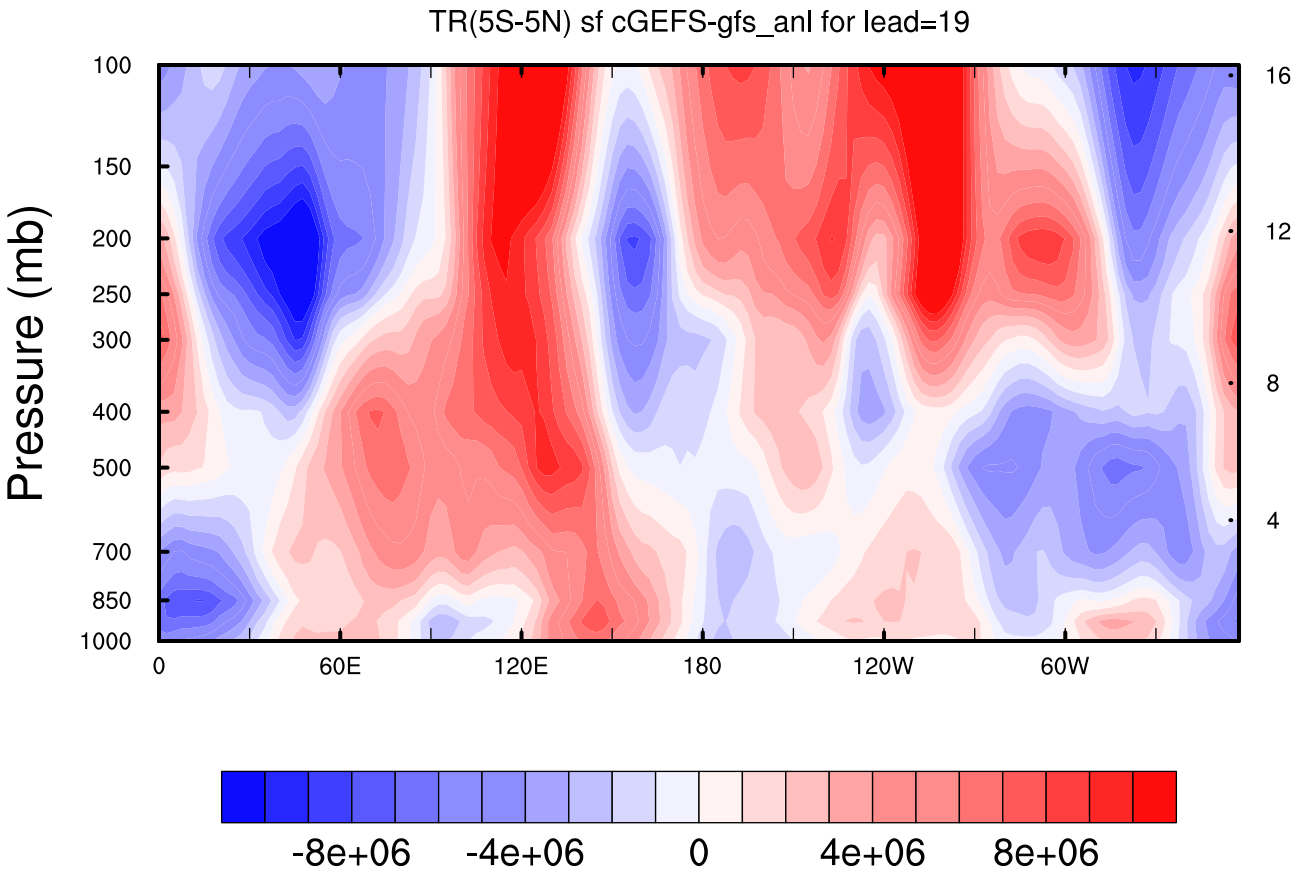
-4e+06
0
4e+06
8e+06

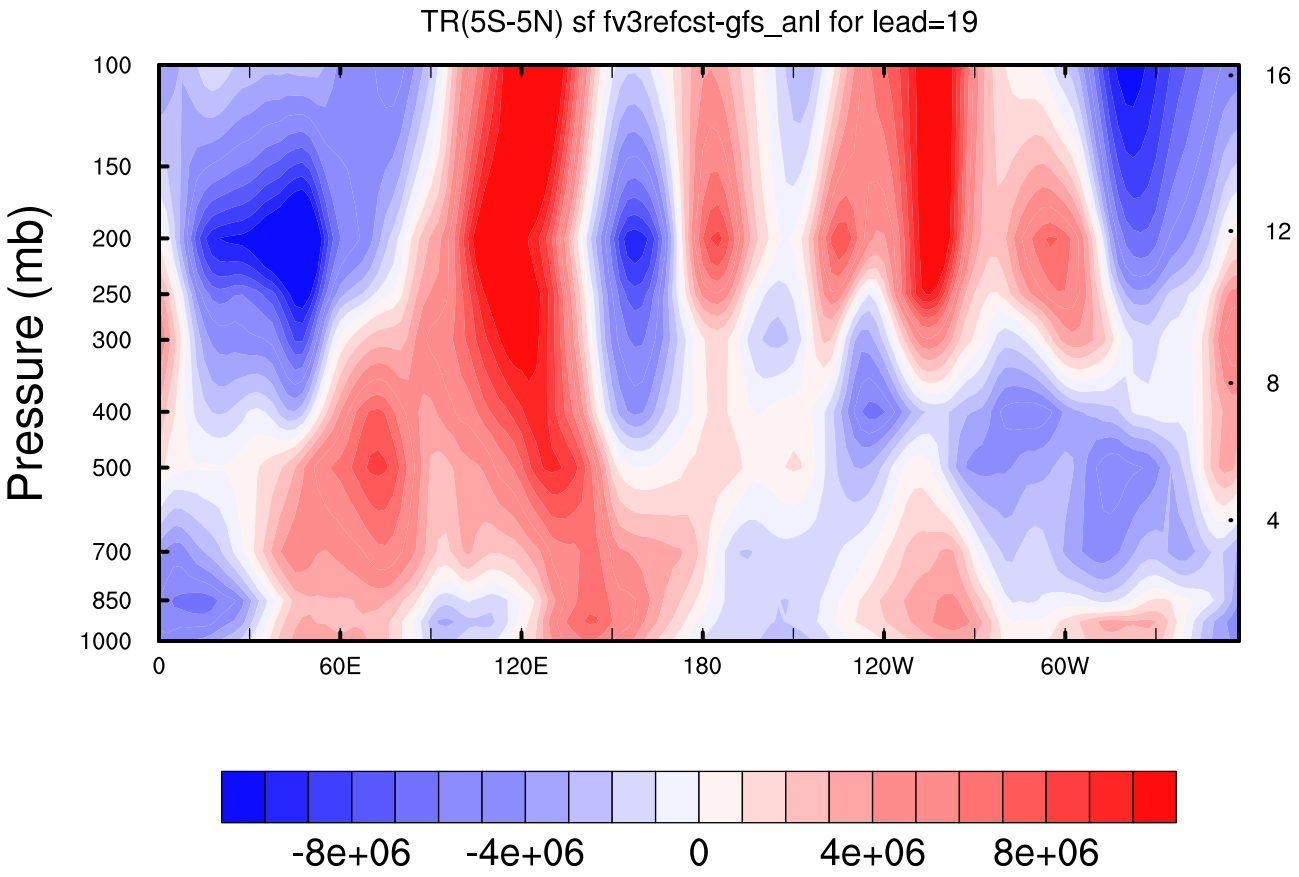

vp 200hPa fv3refcst-gfs_anl for lead=19
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

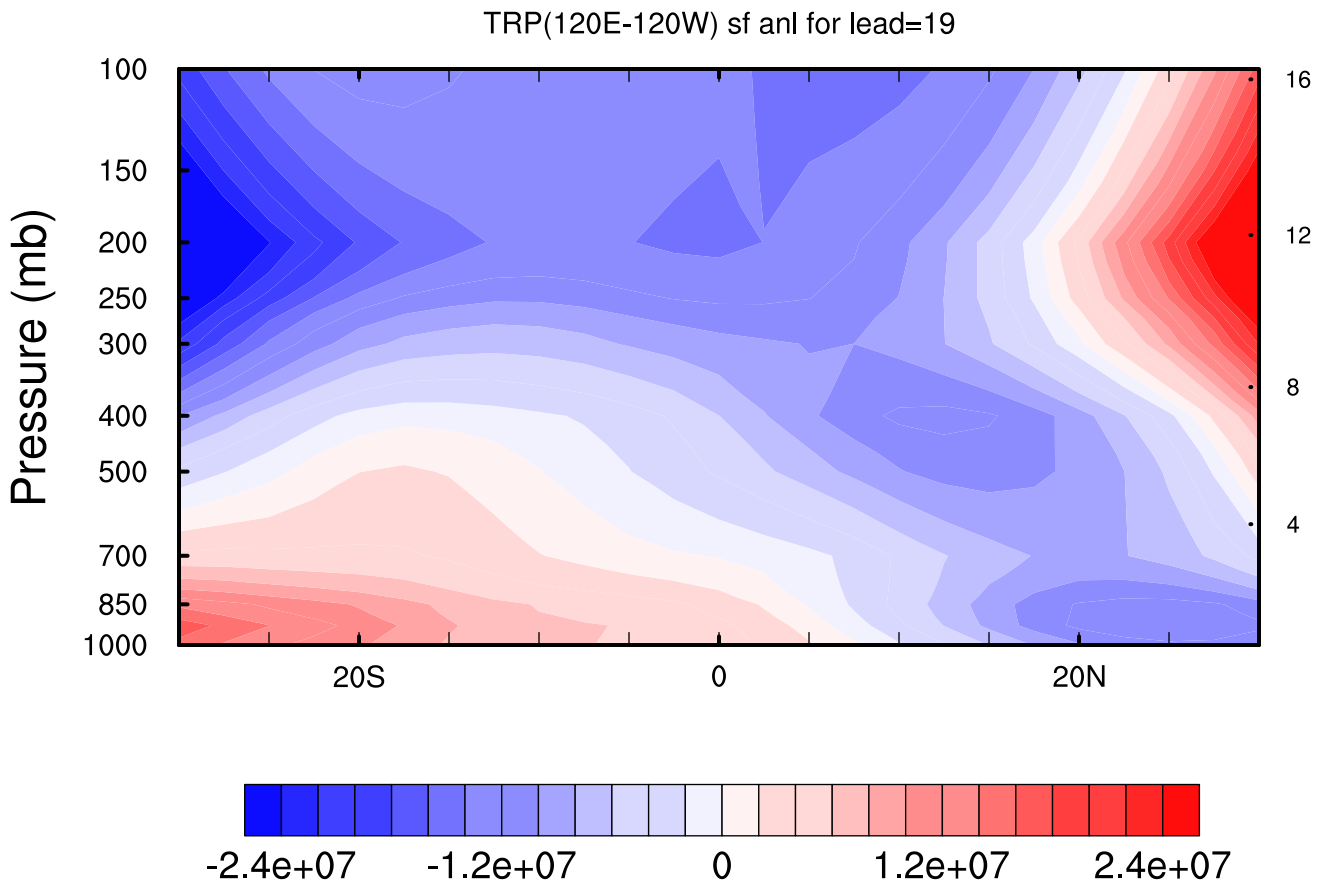

TR(5S-5N) sf anl for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

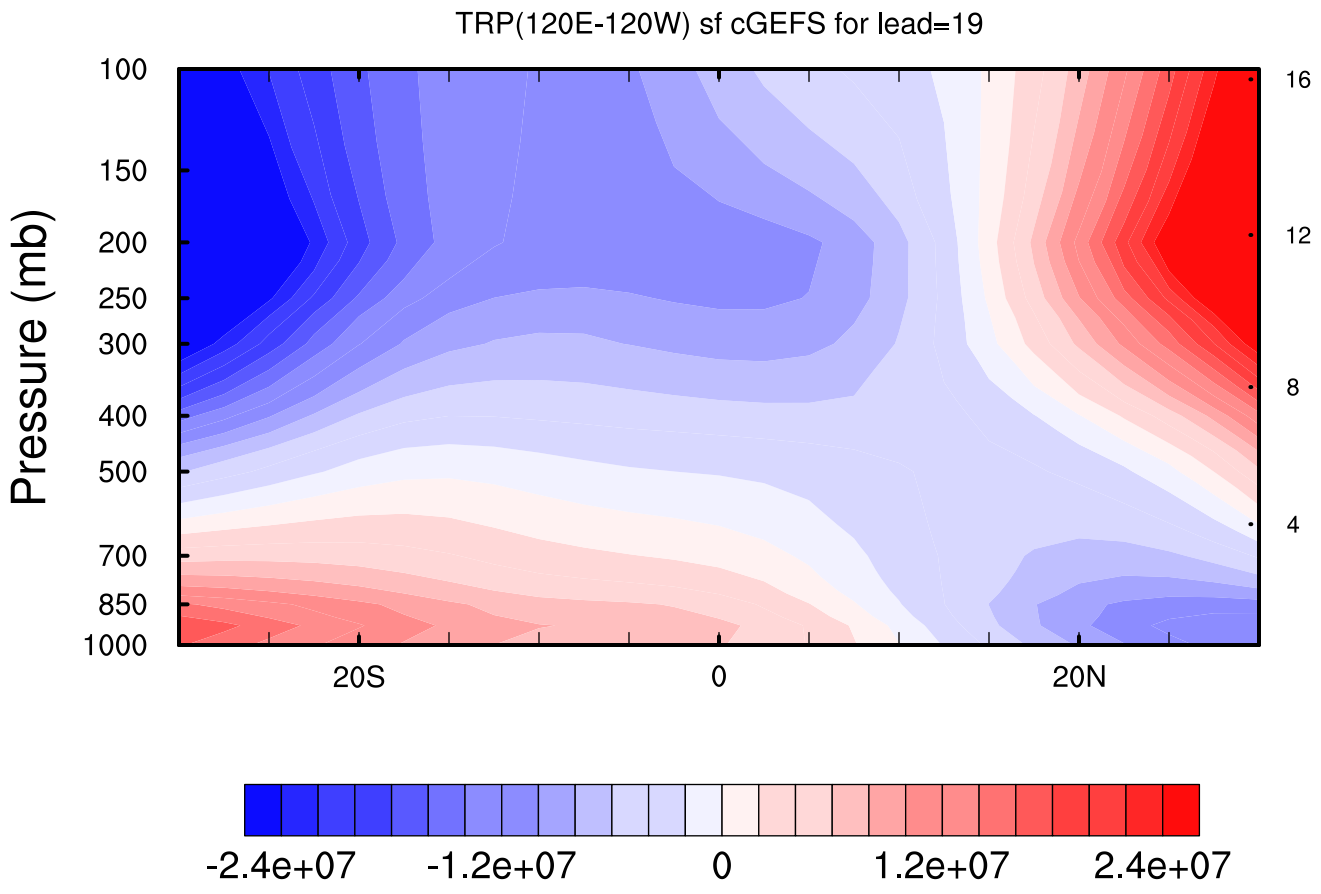

TR(5S-5N) sf cGEFS for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

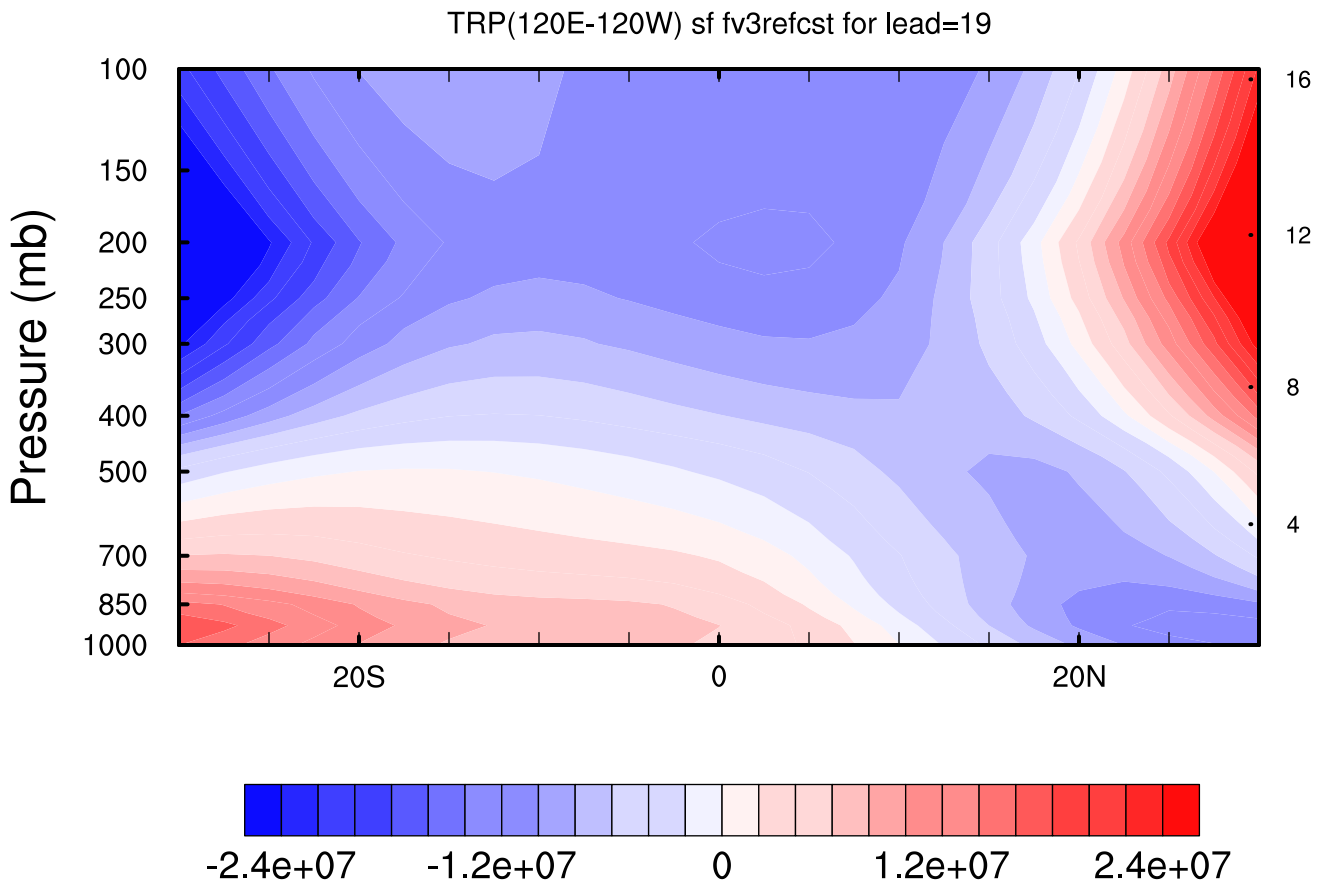

TR(5S-5N) sf fv3refcst for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

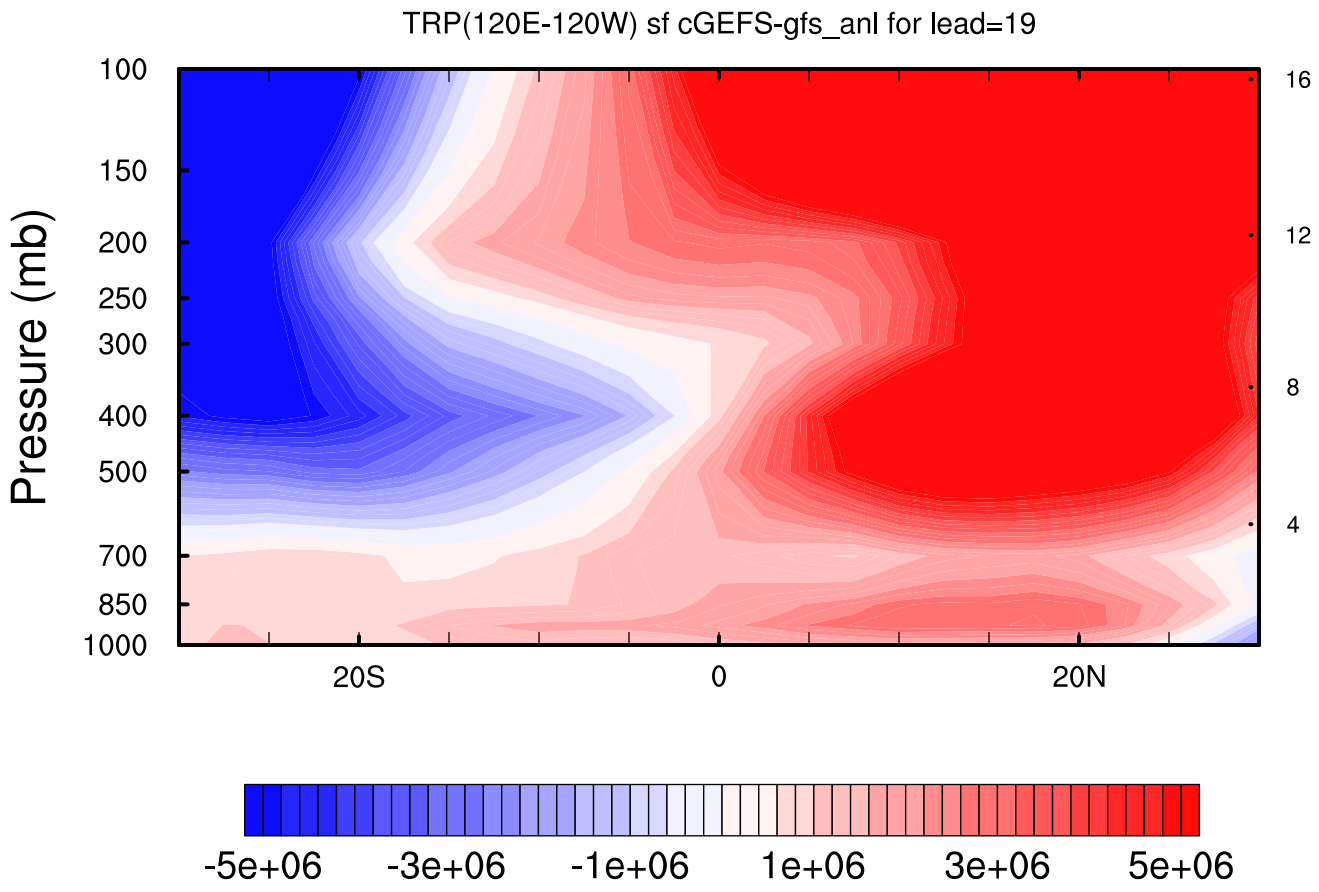

TR(5S-5N) sf cGEFS-gfs_anl for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

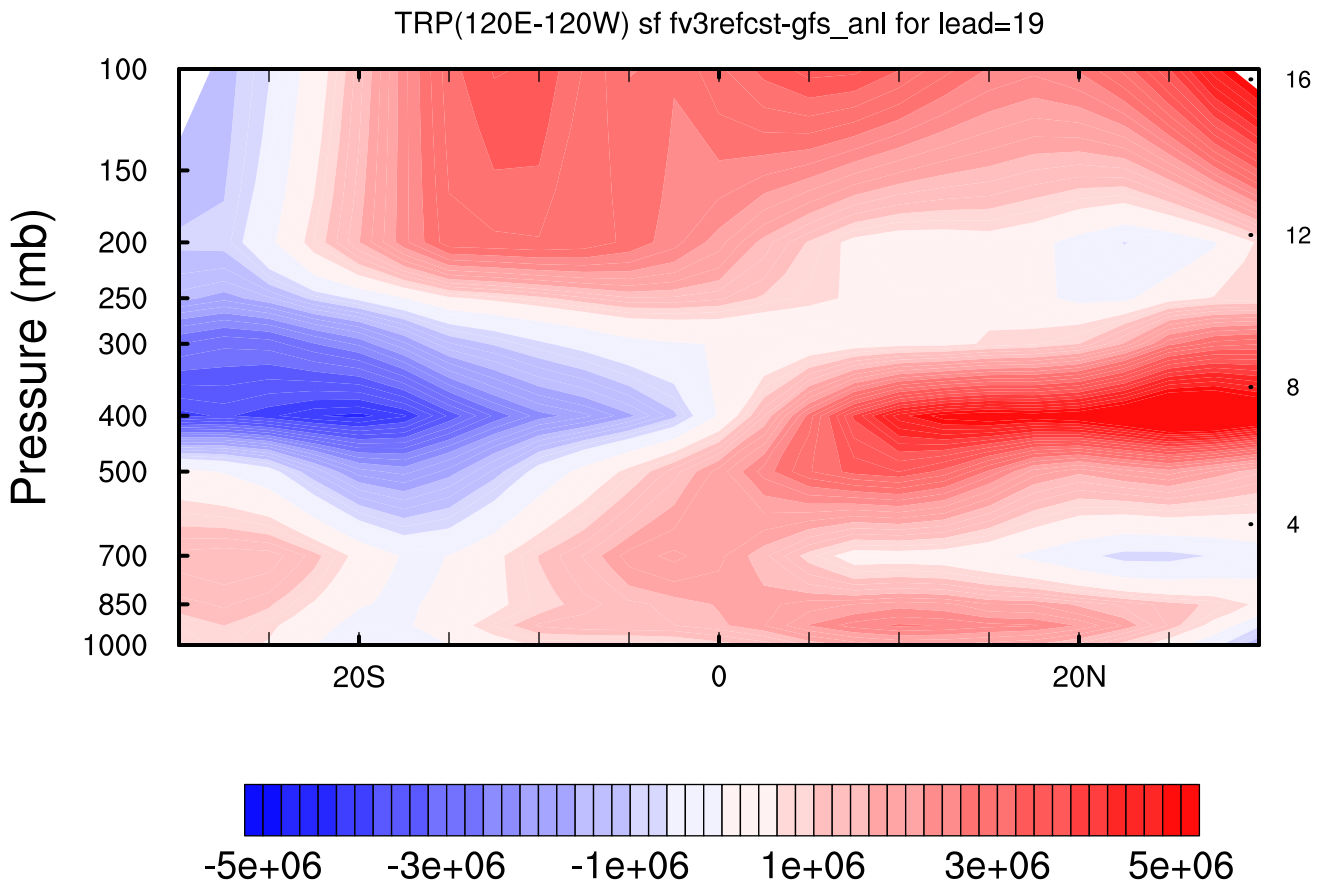

TR(5S-5N) sf fv3refcst-gfs_anl for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

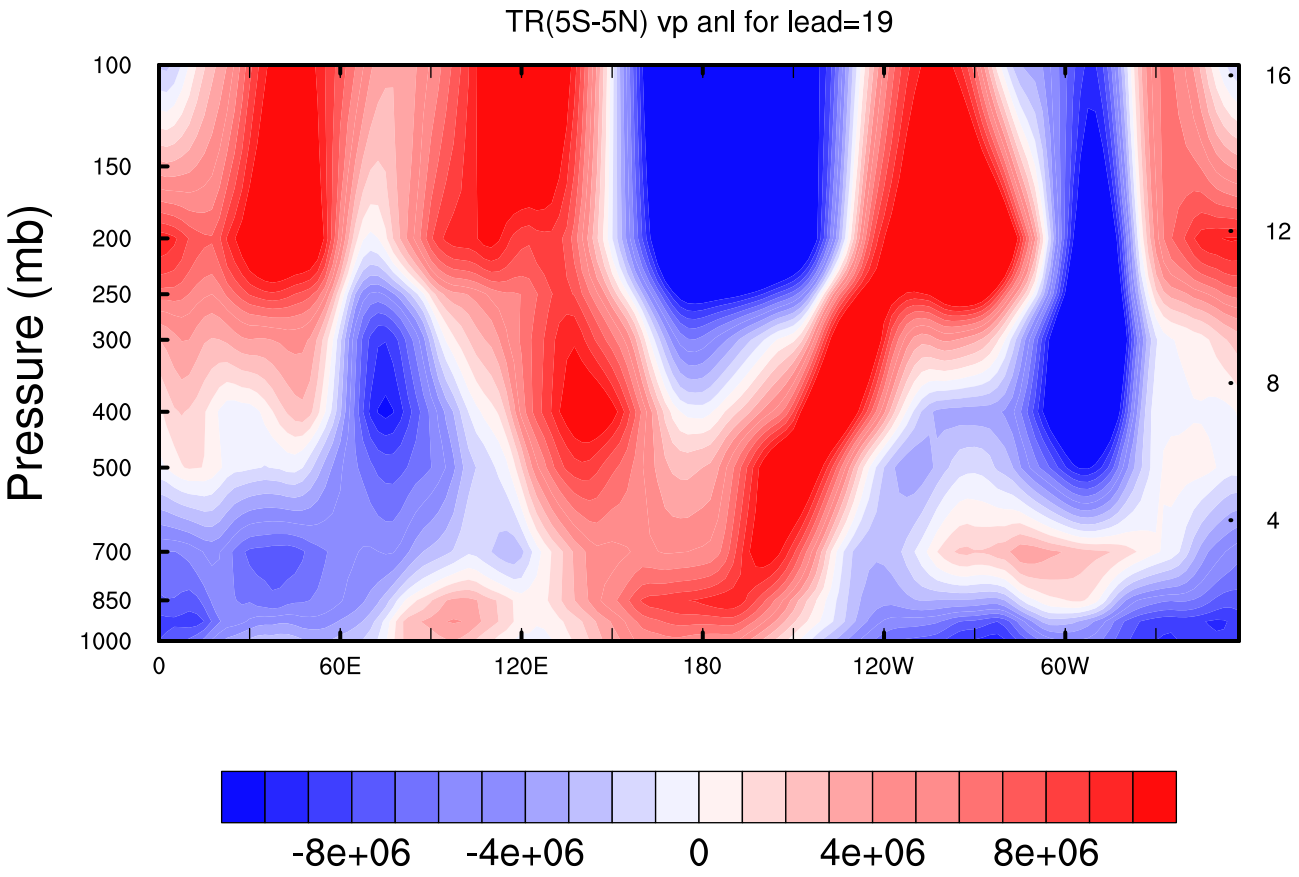

TRP(120E-120W) sf anl for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

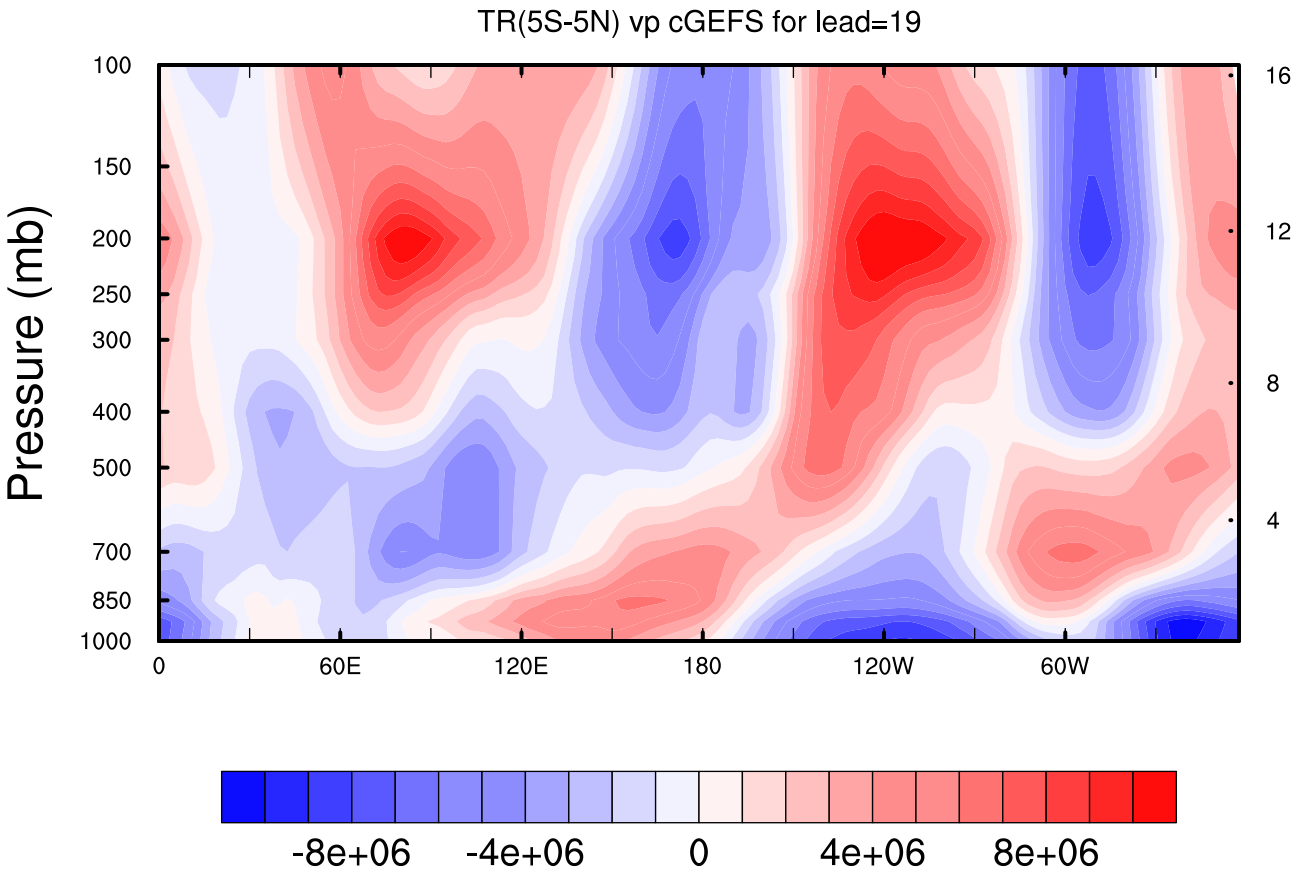

TRP(120E-120W) sf cGEFS for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

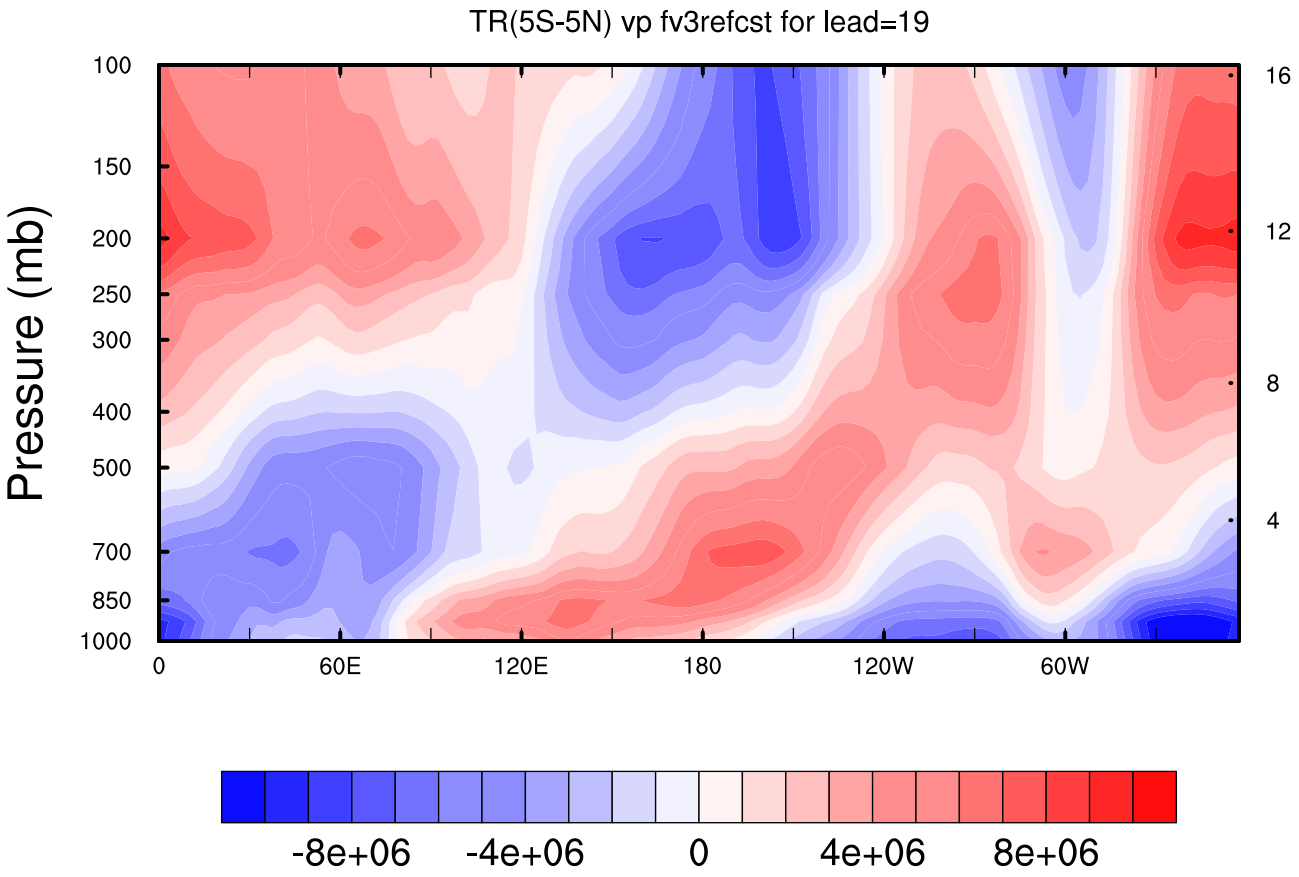

TRP(120E-120W) sf fv3refcst for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

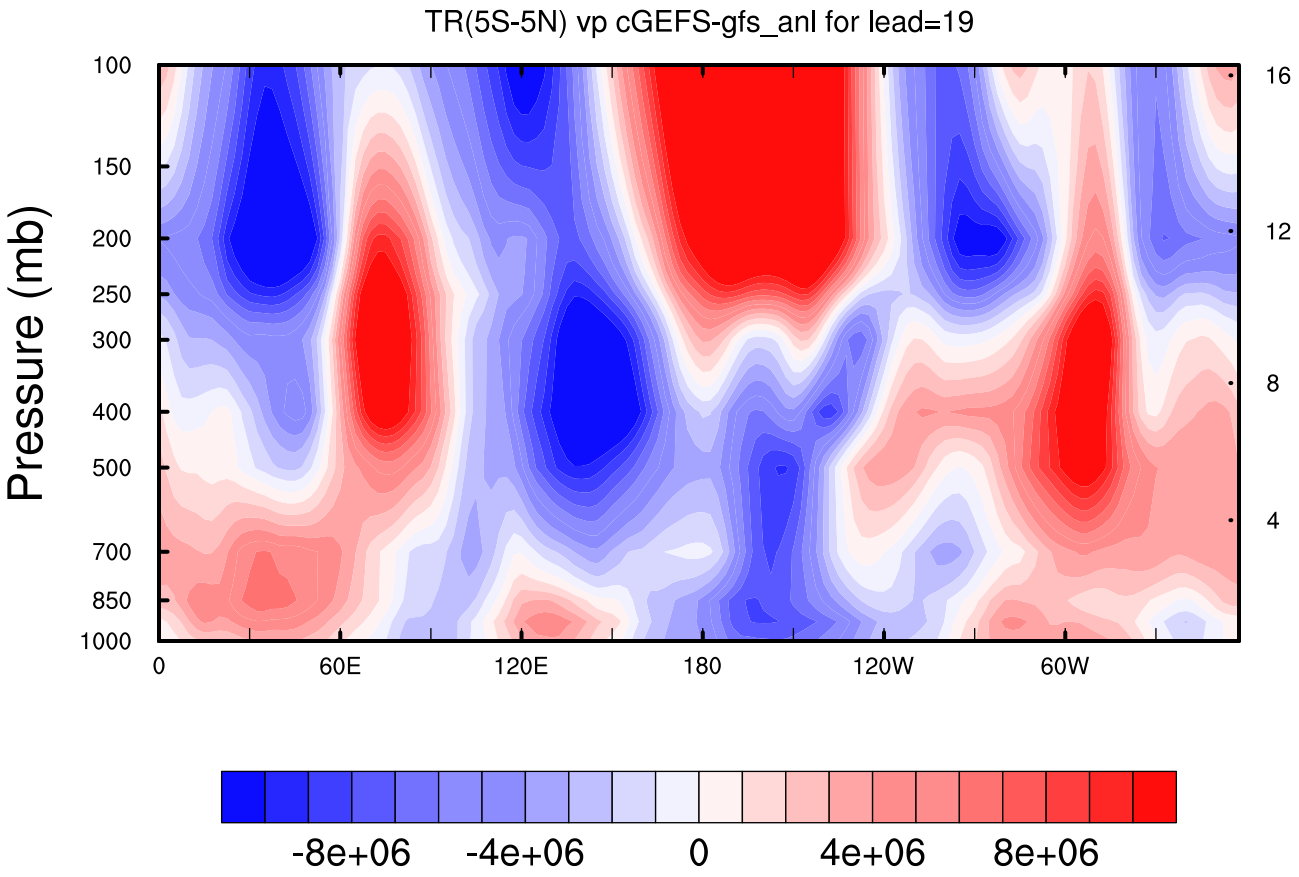

TRP(120E-120W) sf cGEFS-gfs_anl for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

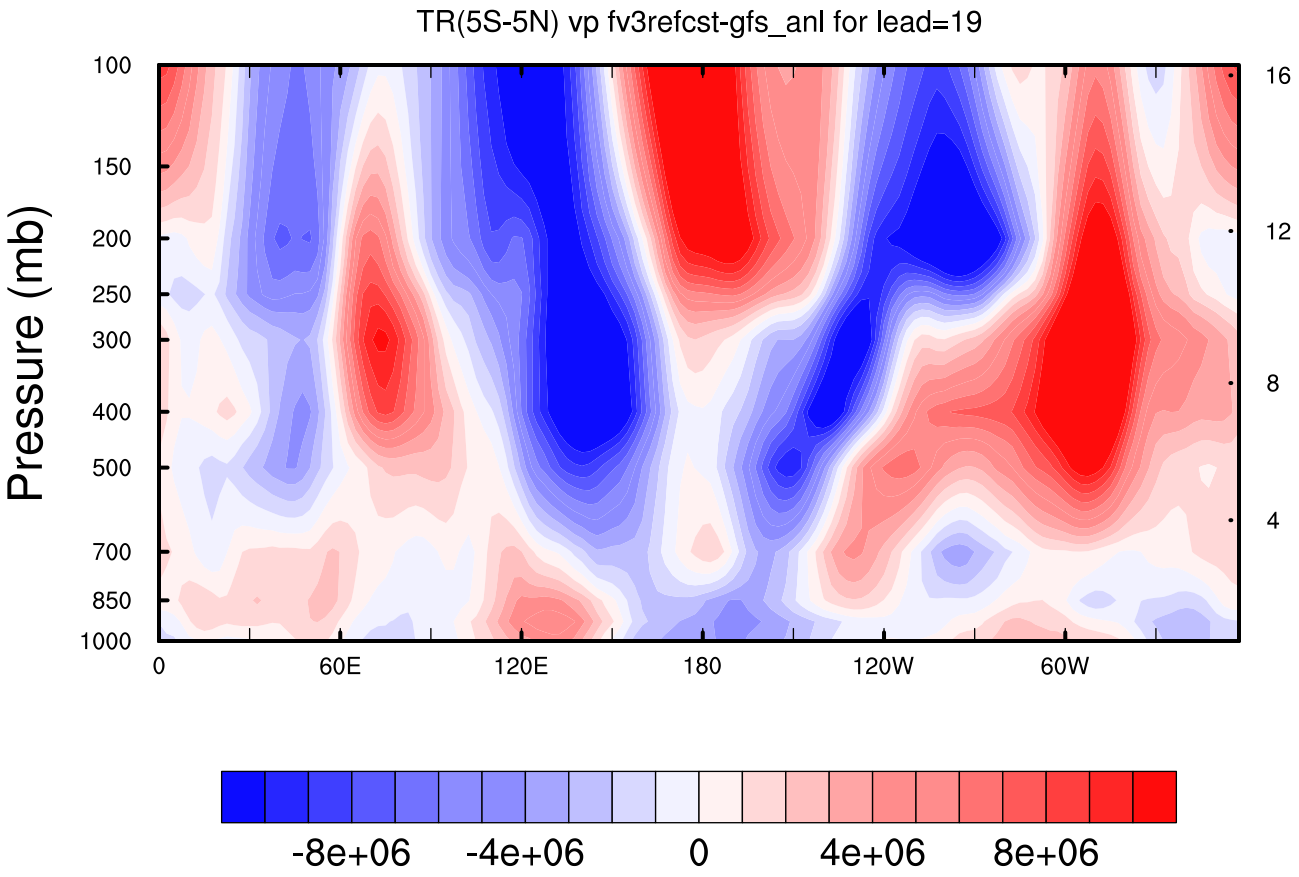

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

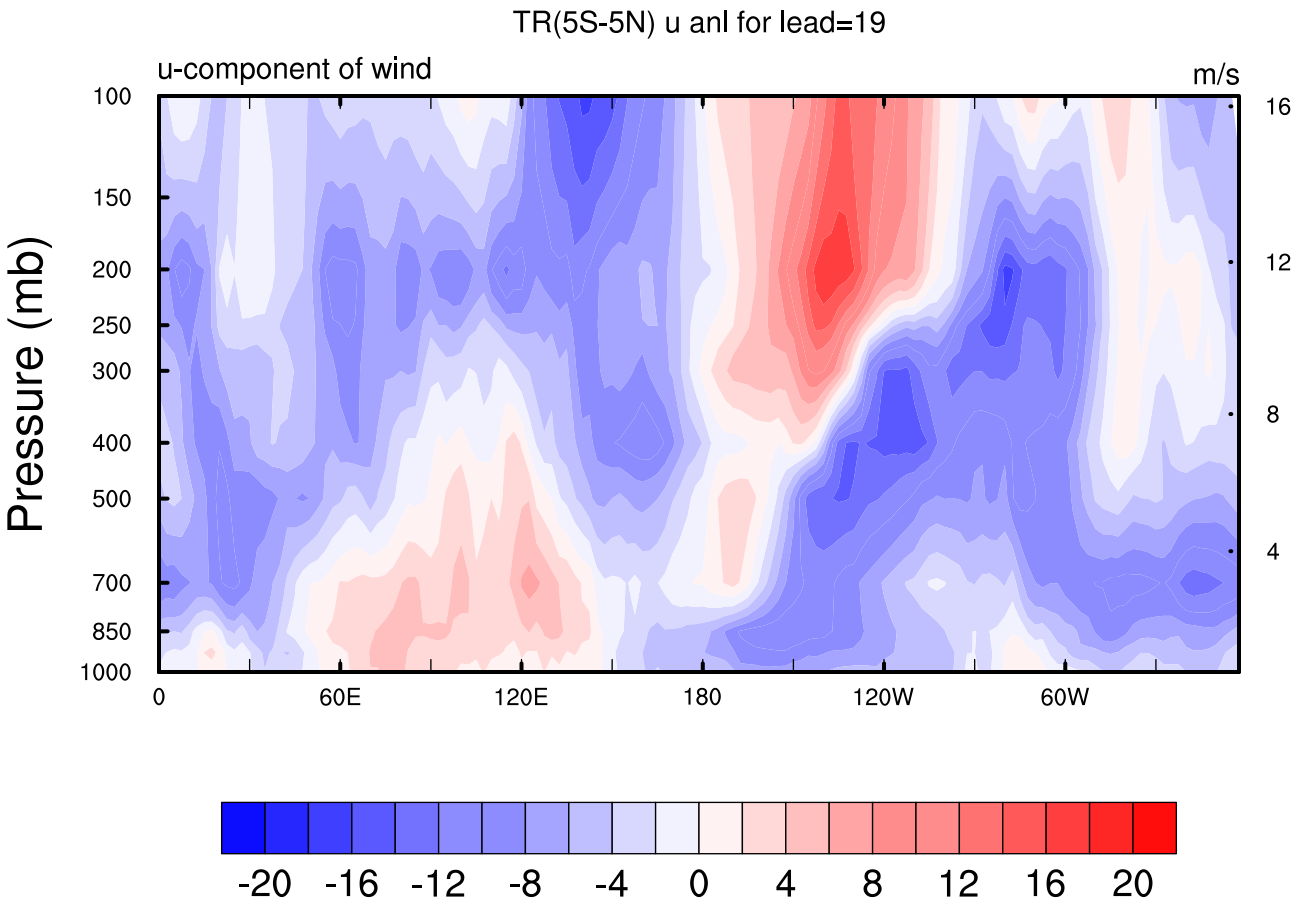

TR(5S-5N) vp anl for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

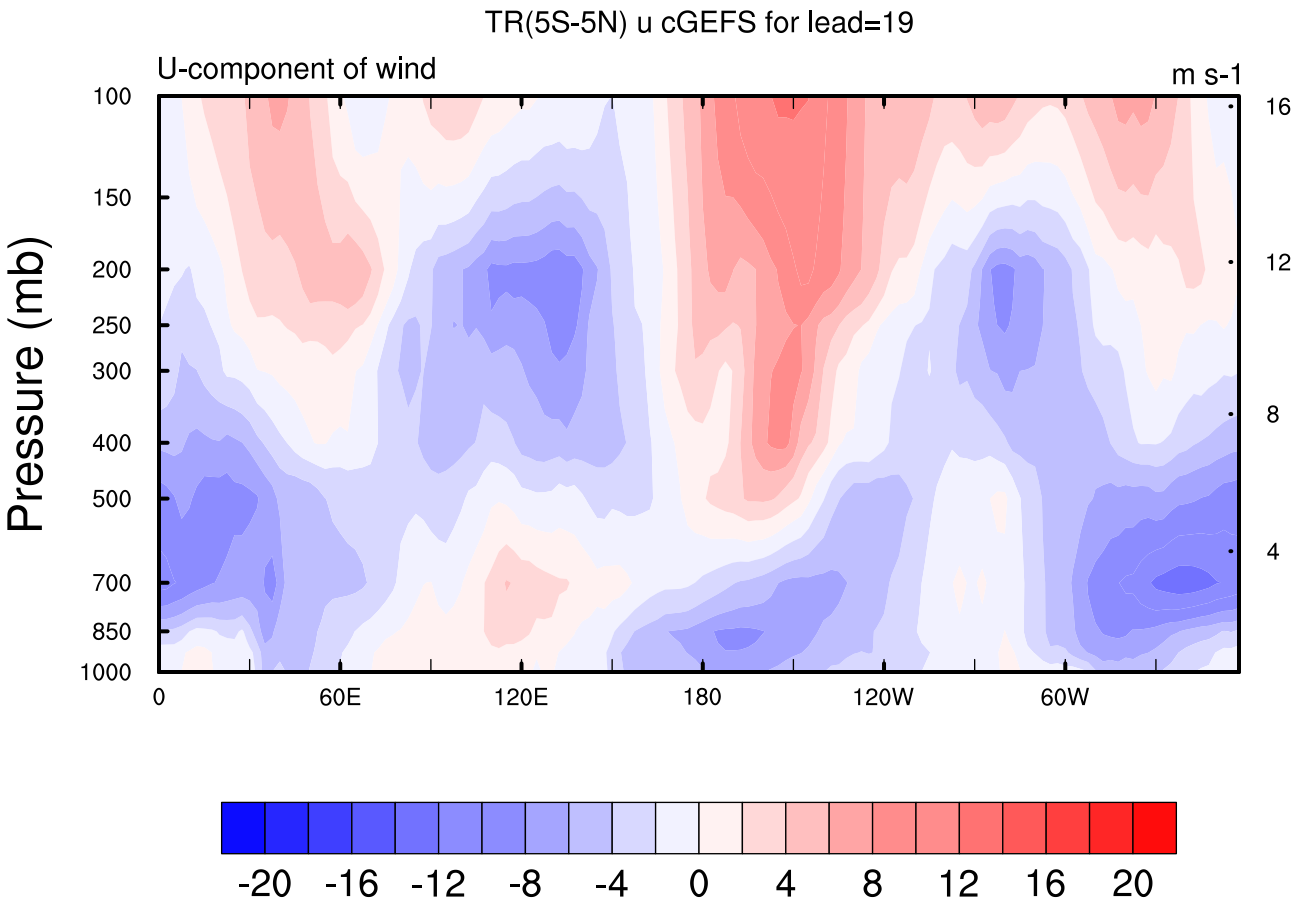

TR(5S-5N) vp cGEFS for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

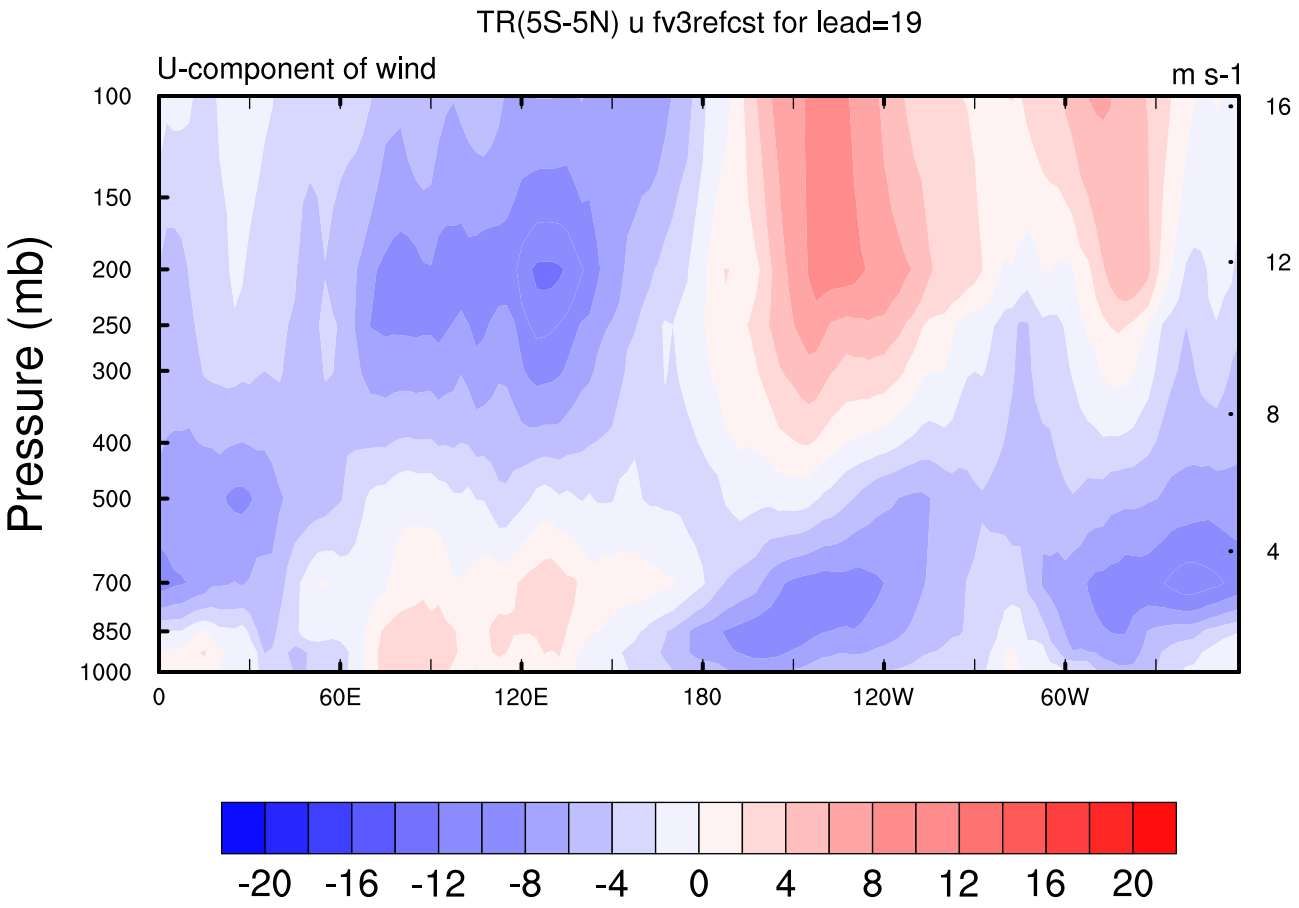

TR(5S-5N) vp fv3refcst for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

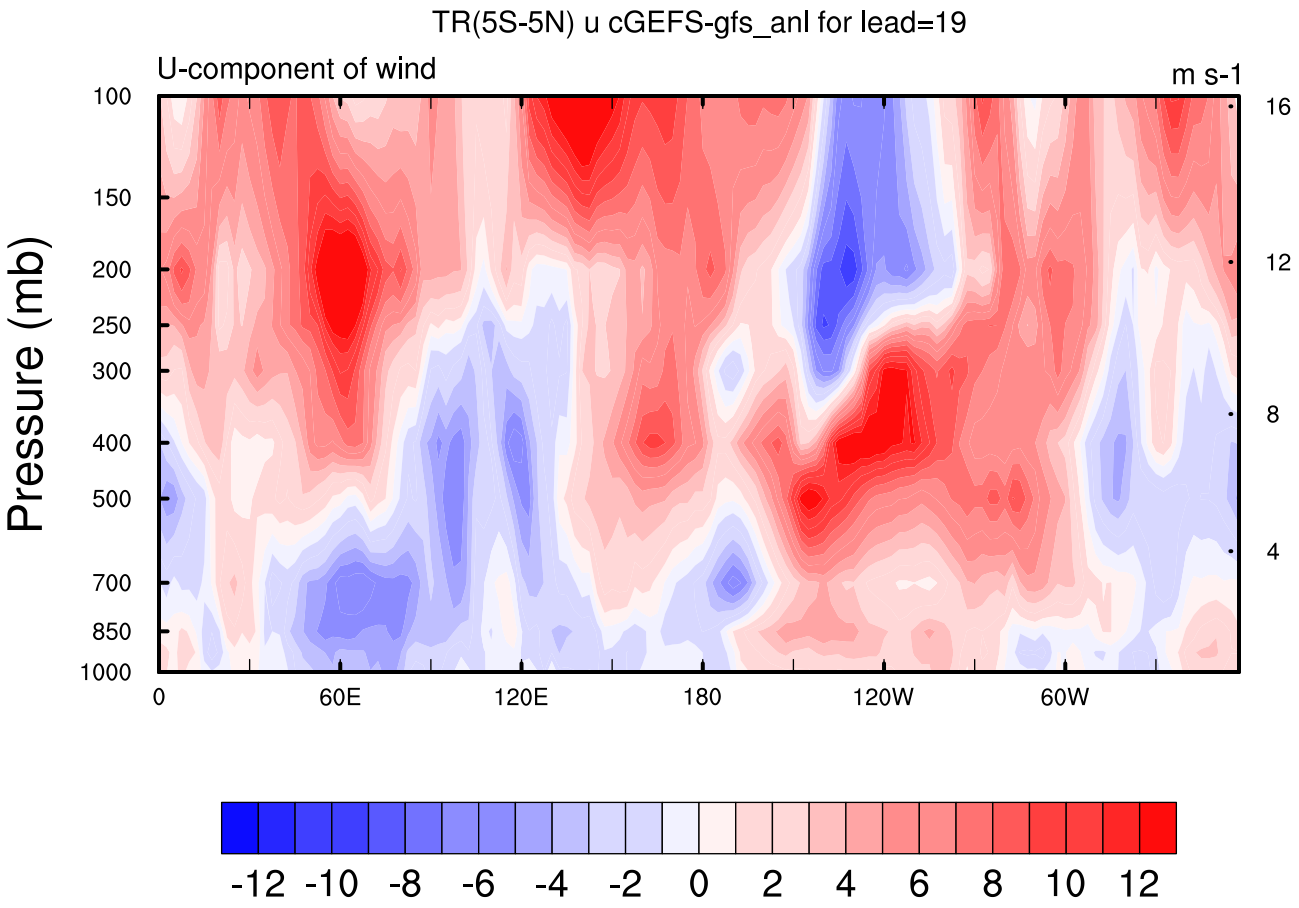

TR(5S-5N) vp cGEFS-gfs_anl for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

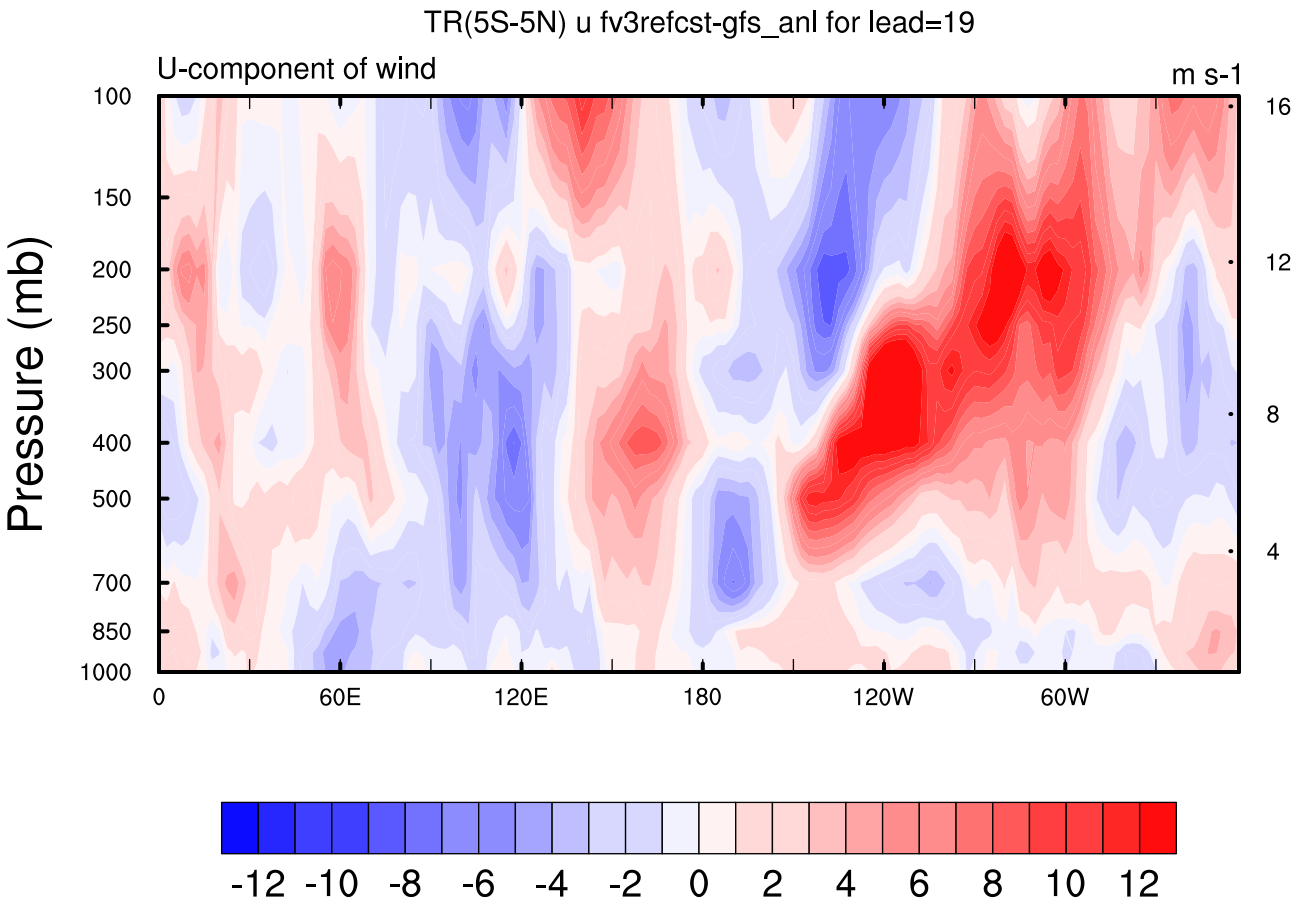

TR(5S-5N) vp fv3refcst-gfs_anl for lead=19
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

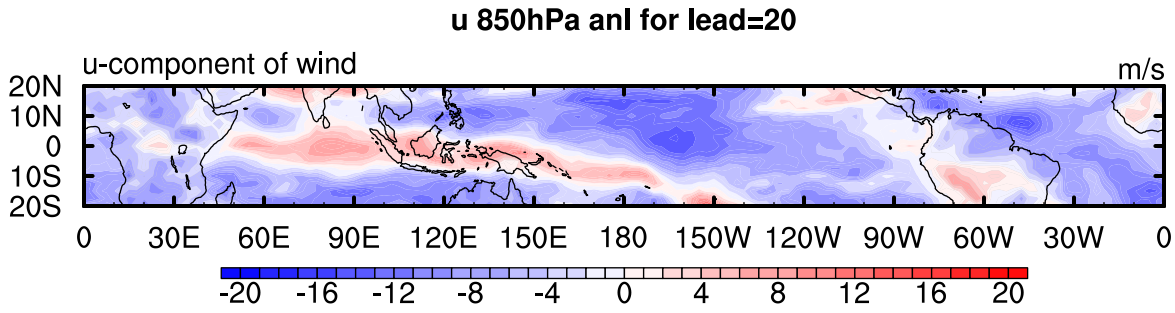

TR(5S-5N) u anl for lead=19
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

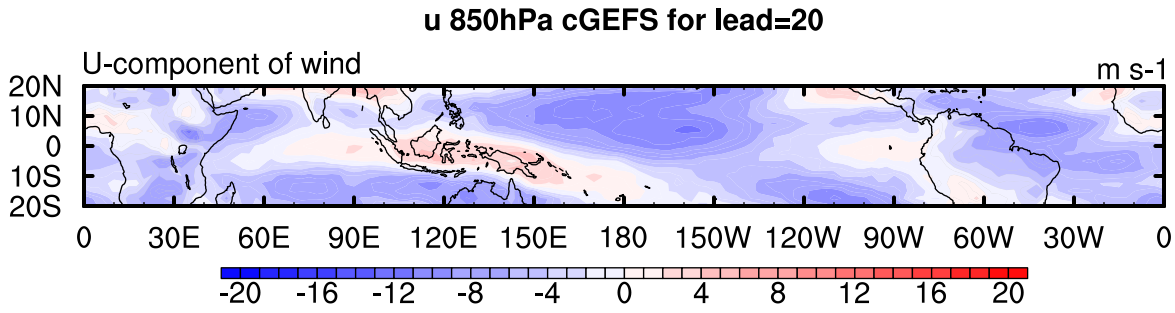

TR(5S-5N) u cGEFS for lead=19
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

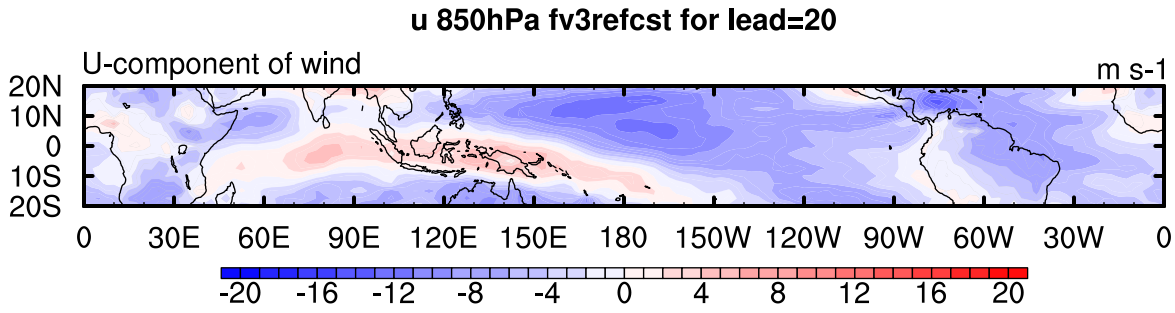

TR(5S-5N) u fv3refcst for lead=19
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

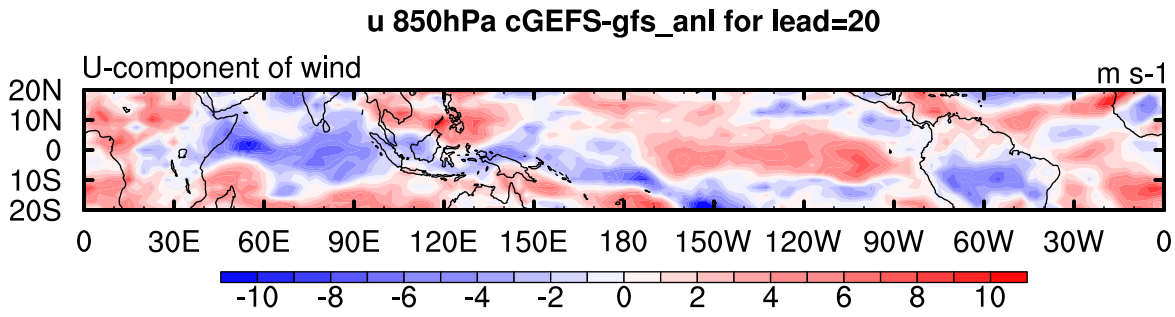

TR(5S-5N) u cGEFS-gfs_anl for lead=19
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

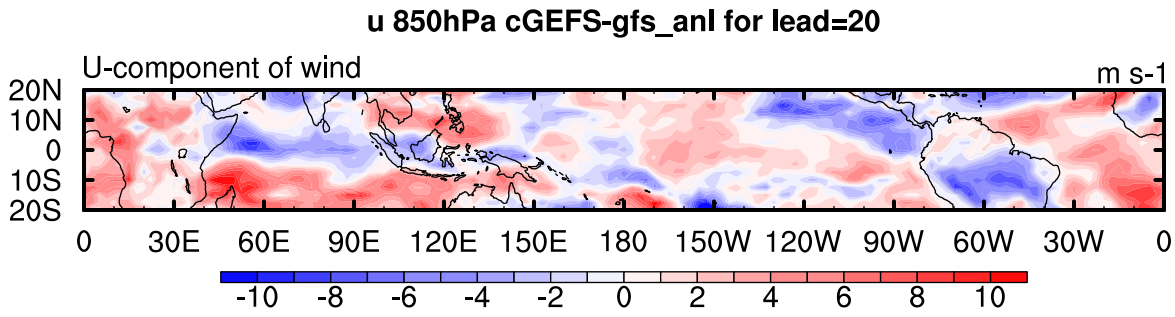

TR(5S-5N) u fv3refcst-gfs_anl for lead=19
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

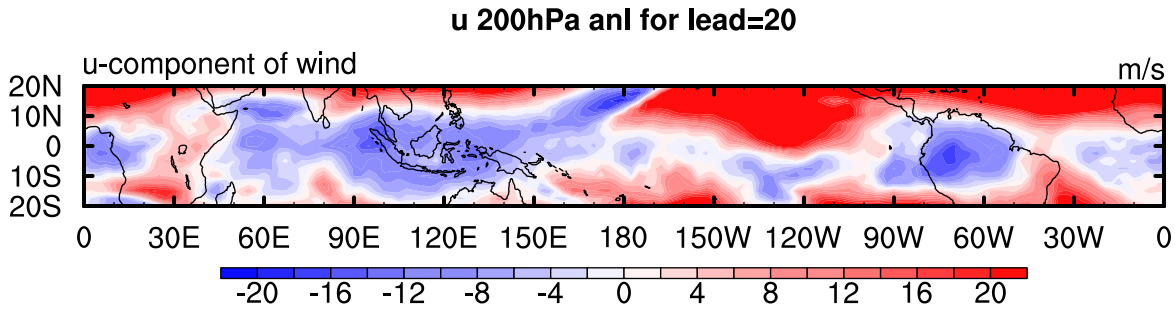

u 850hPa anl for lead=20
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

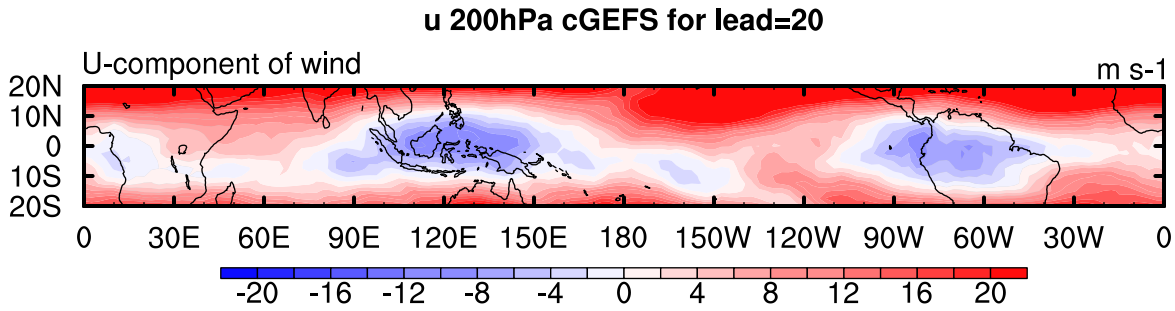

u 850hPa cGEFS for lead=20
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

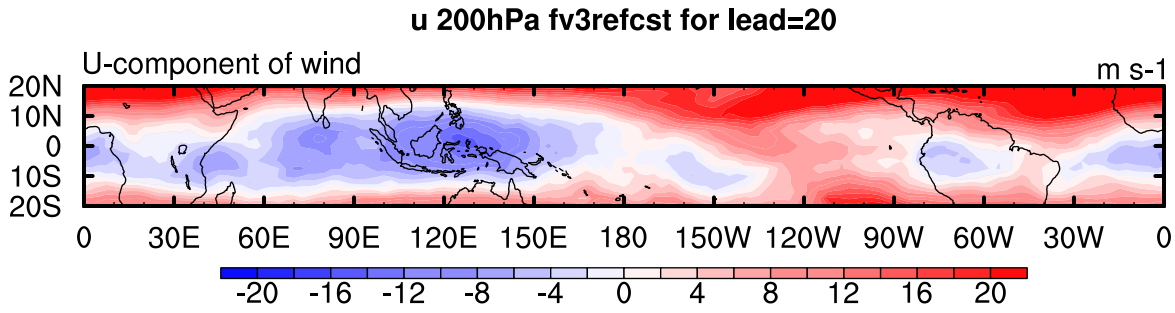

u 850hPa fv3refcst for lead=20
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

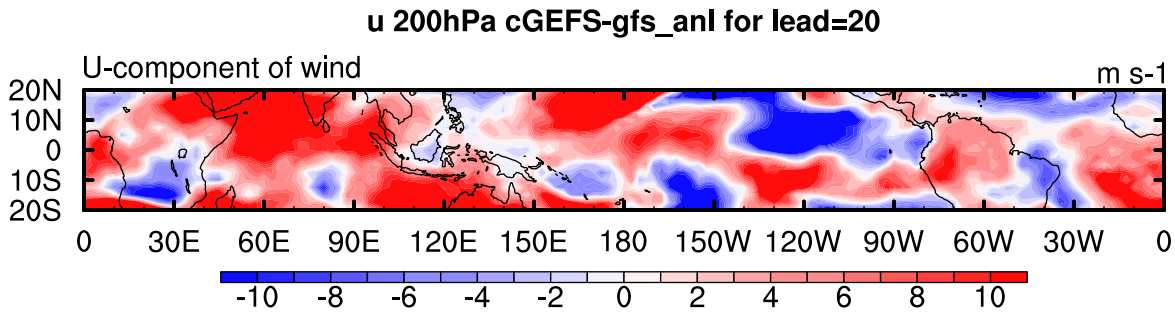

u 850hPa cGEFS-gfs_anl for lead=20
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 850hPa cGEFS-gfs_anl for lead=20
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=20
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=20
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=20
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=20
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-10
-8
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-4
-2
0
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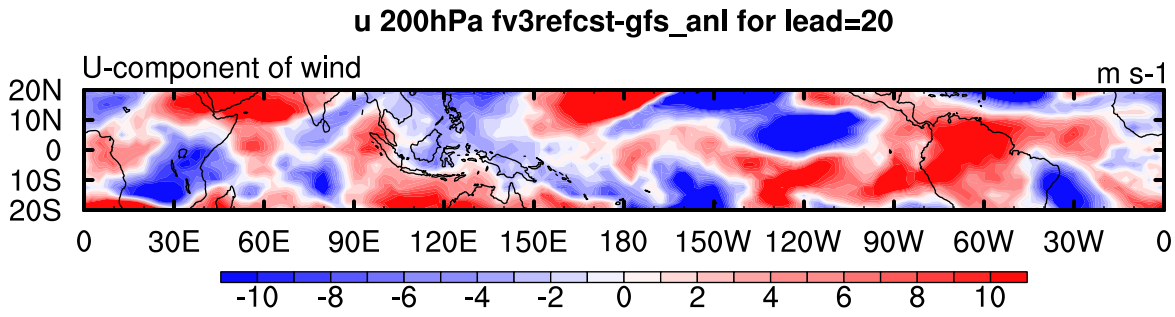
4
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=20
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
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-4
-2
0
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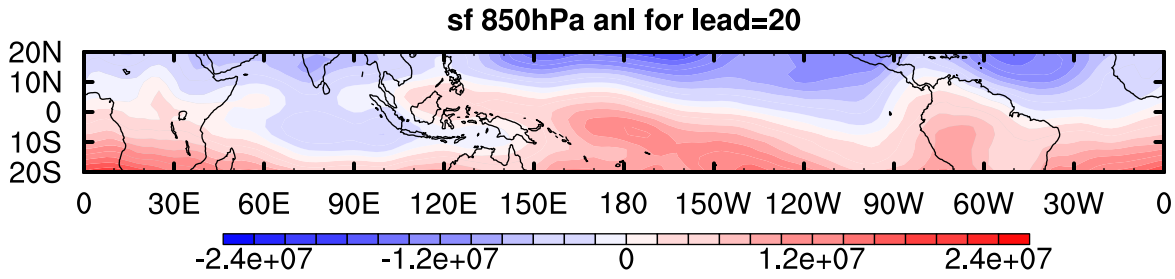
4
6
8
10


sf 850hPa anl for lead=20
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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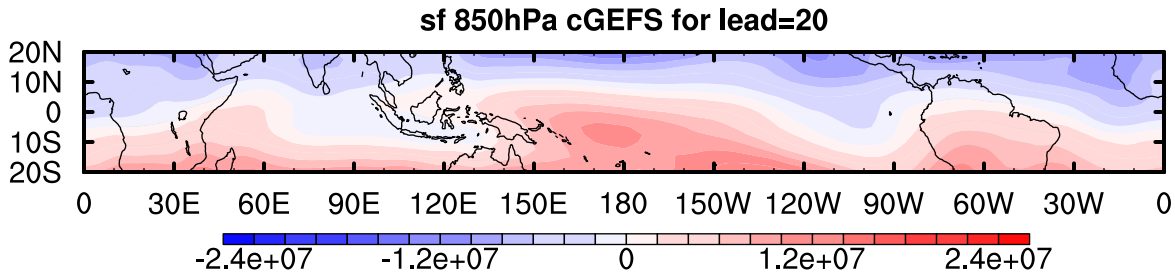
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=20
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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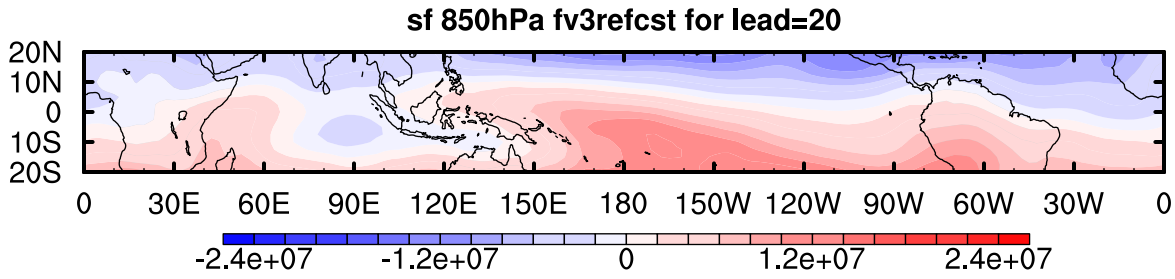
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90E
120E
150E
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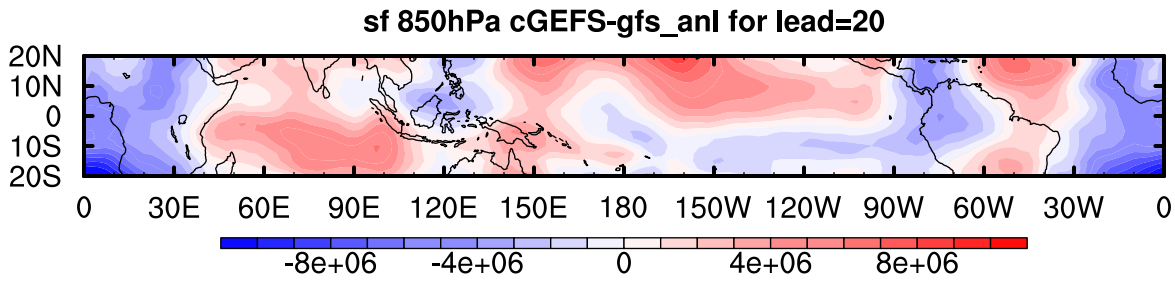
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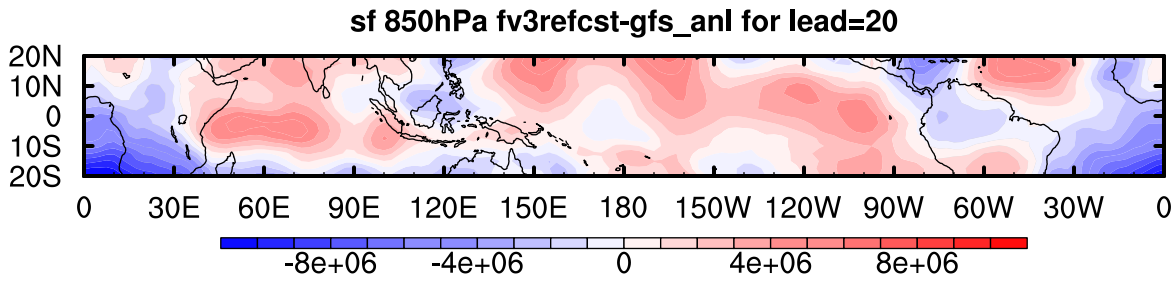
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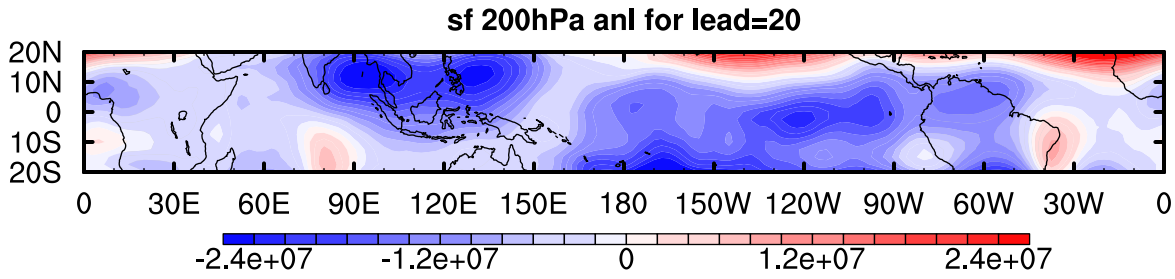
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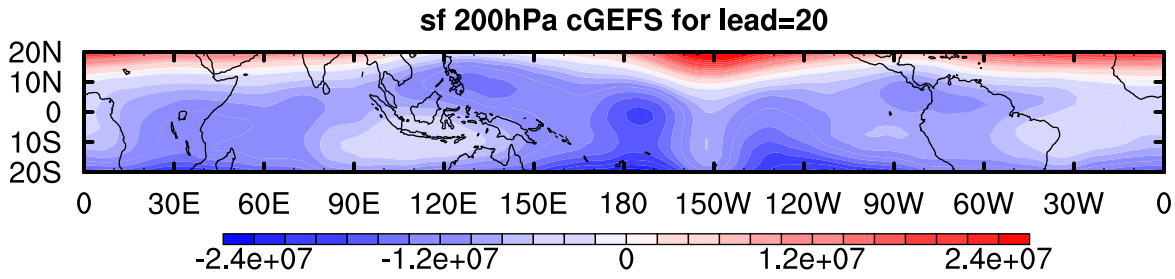
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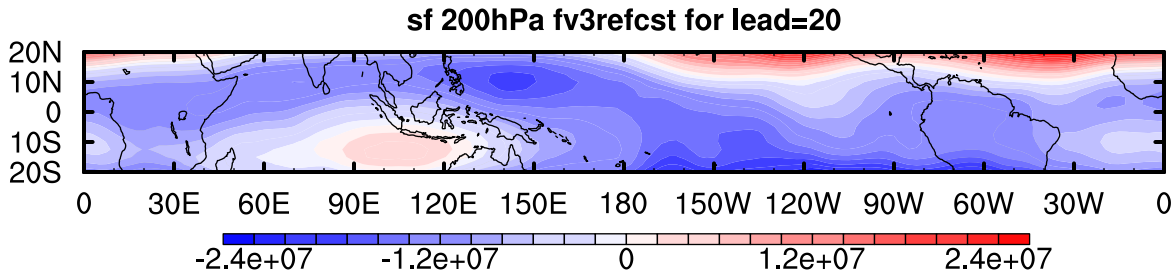
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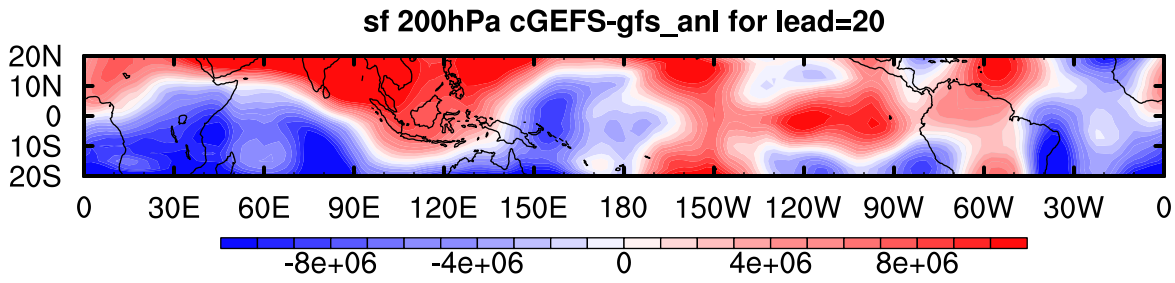
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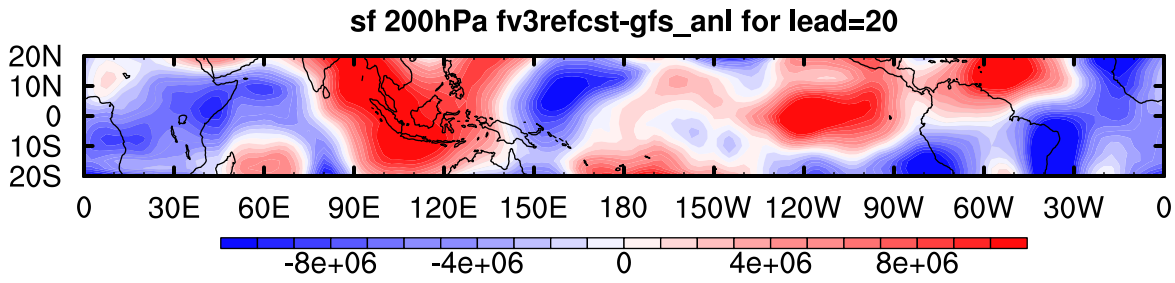
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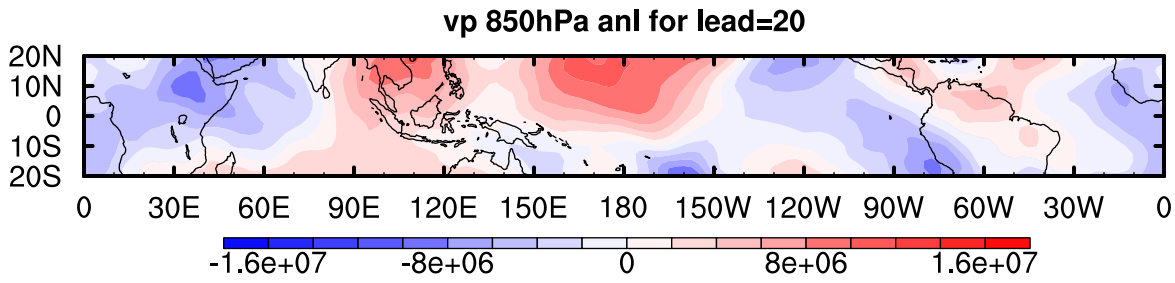
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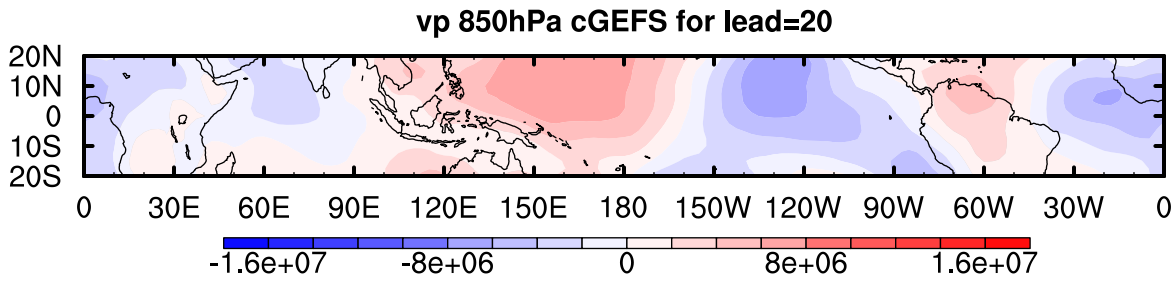
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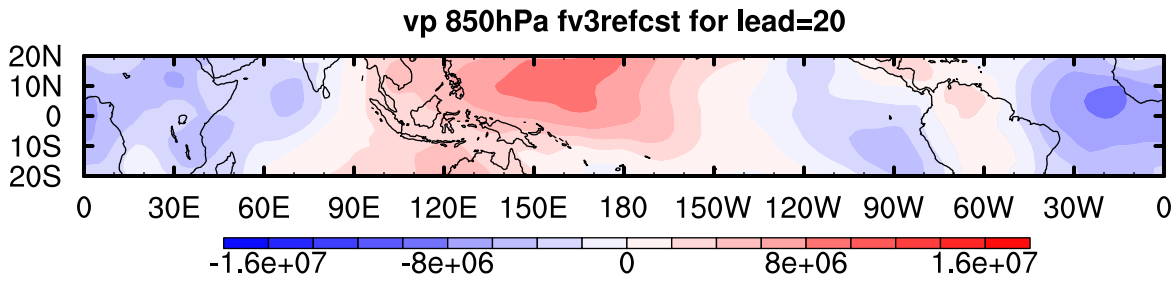
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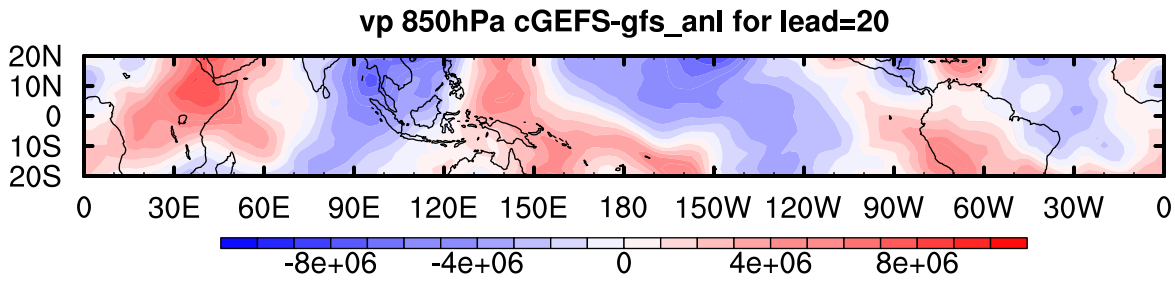
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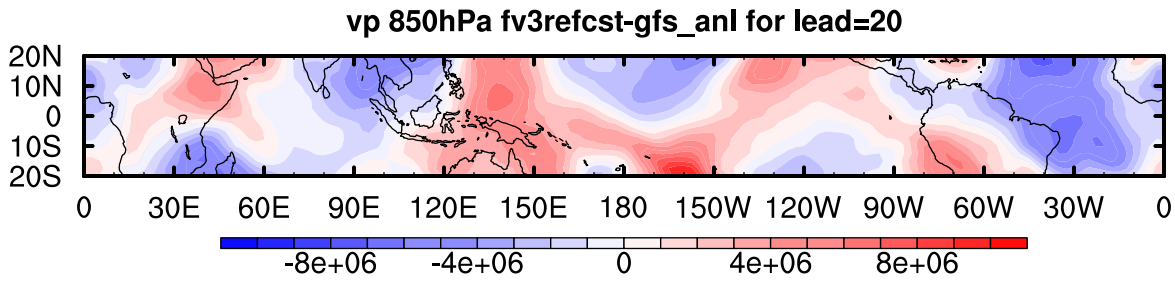
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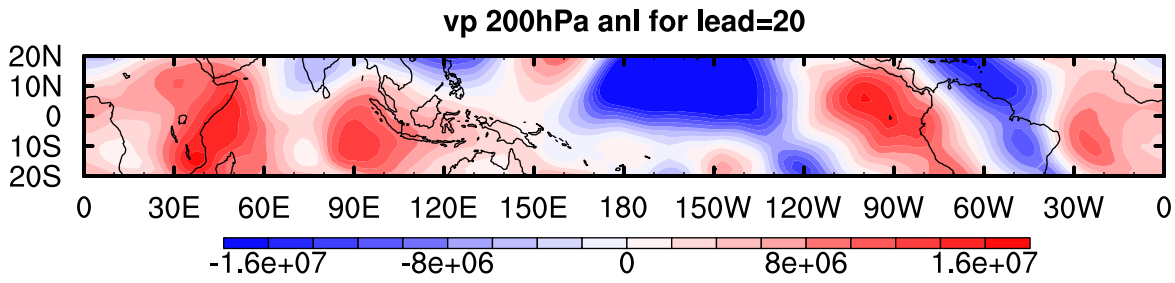
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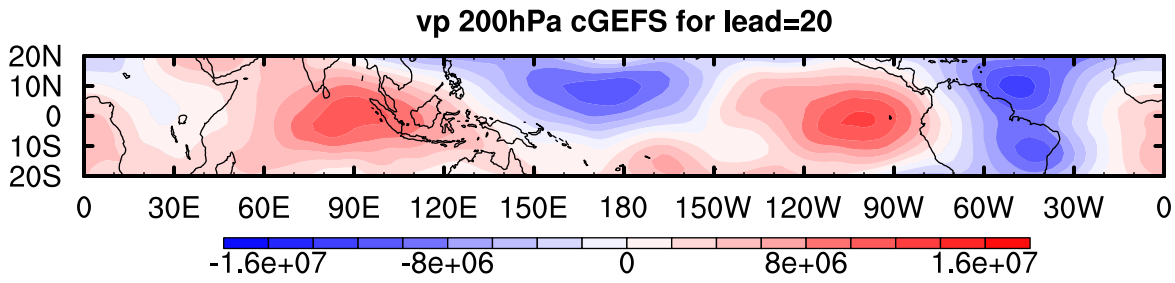
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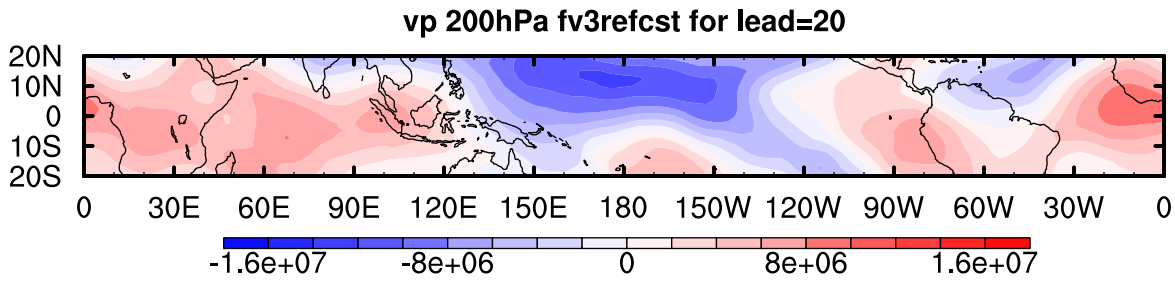
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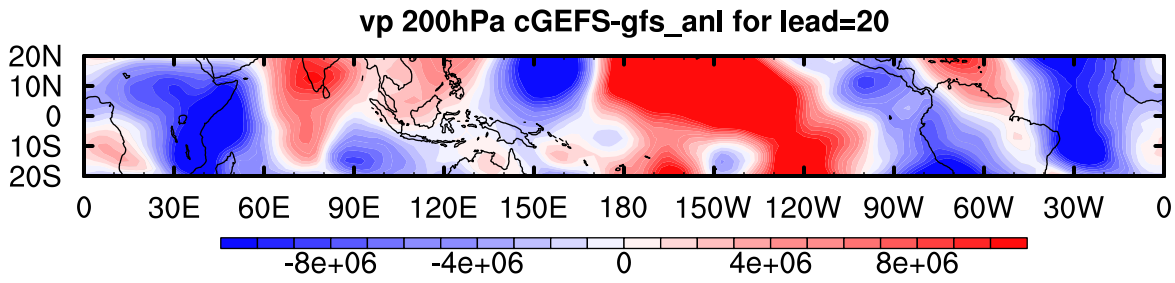
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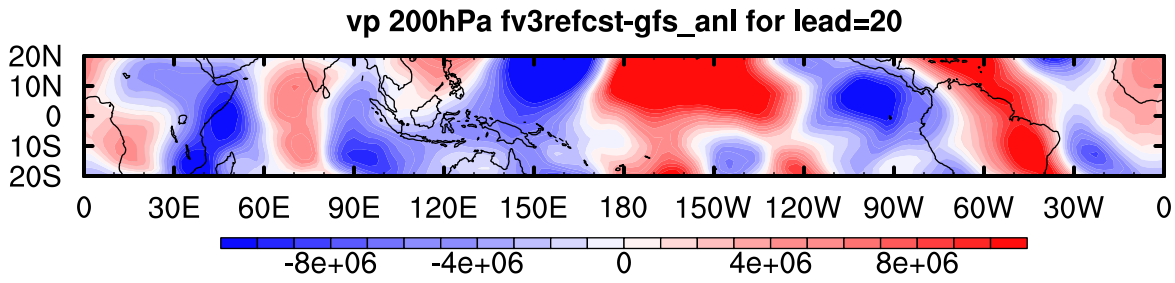
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20S
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30E
60E
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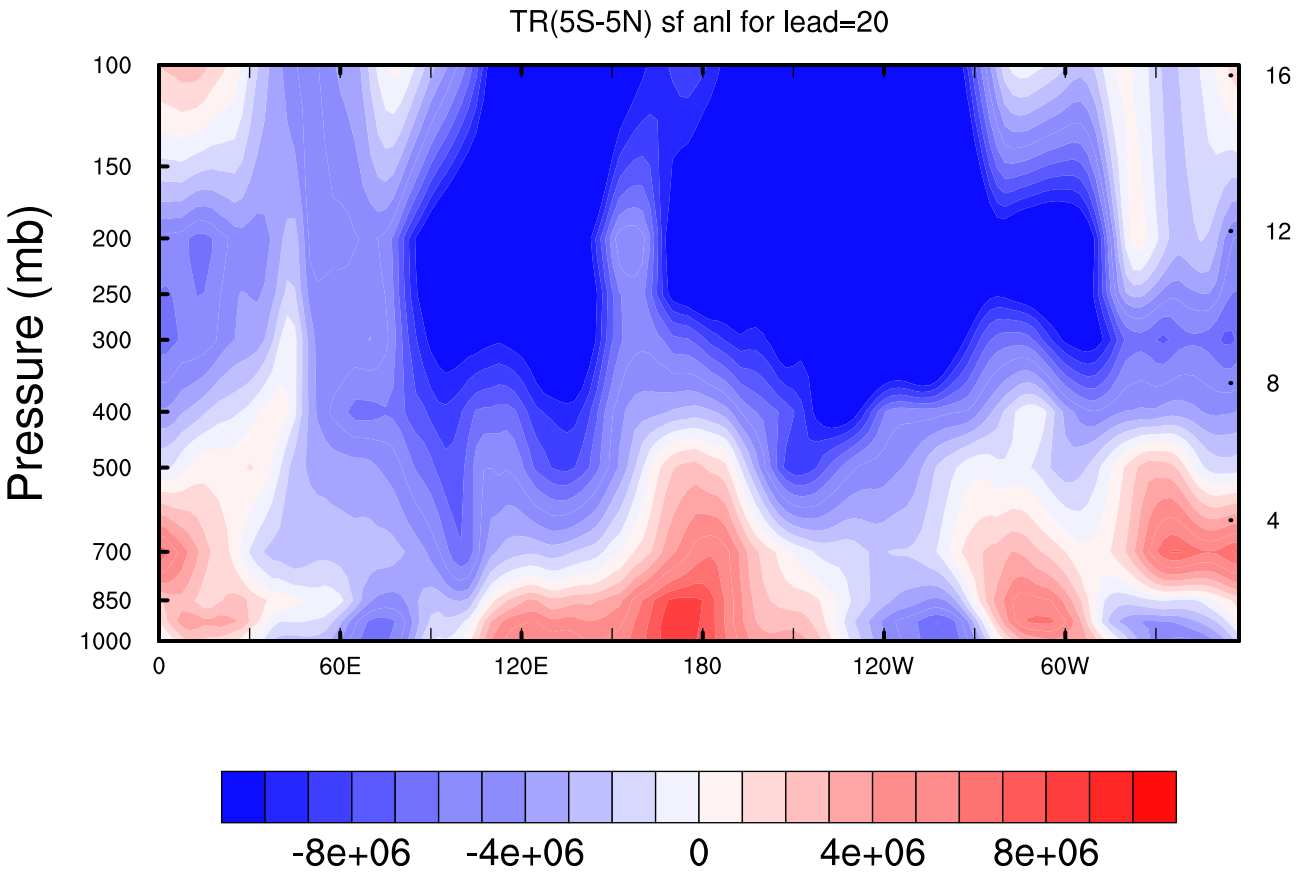
TR(5S-5N) sf anl for lead=20
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
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120E
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120W
60W
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12
8
4
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-4e+06
0
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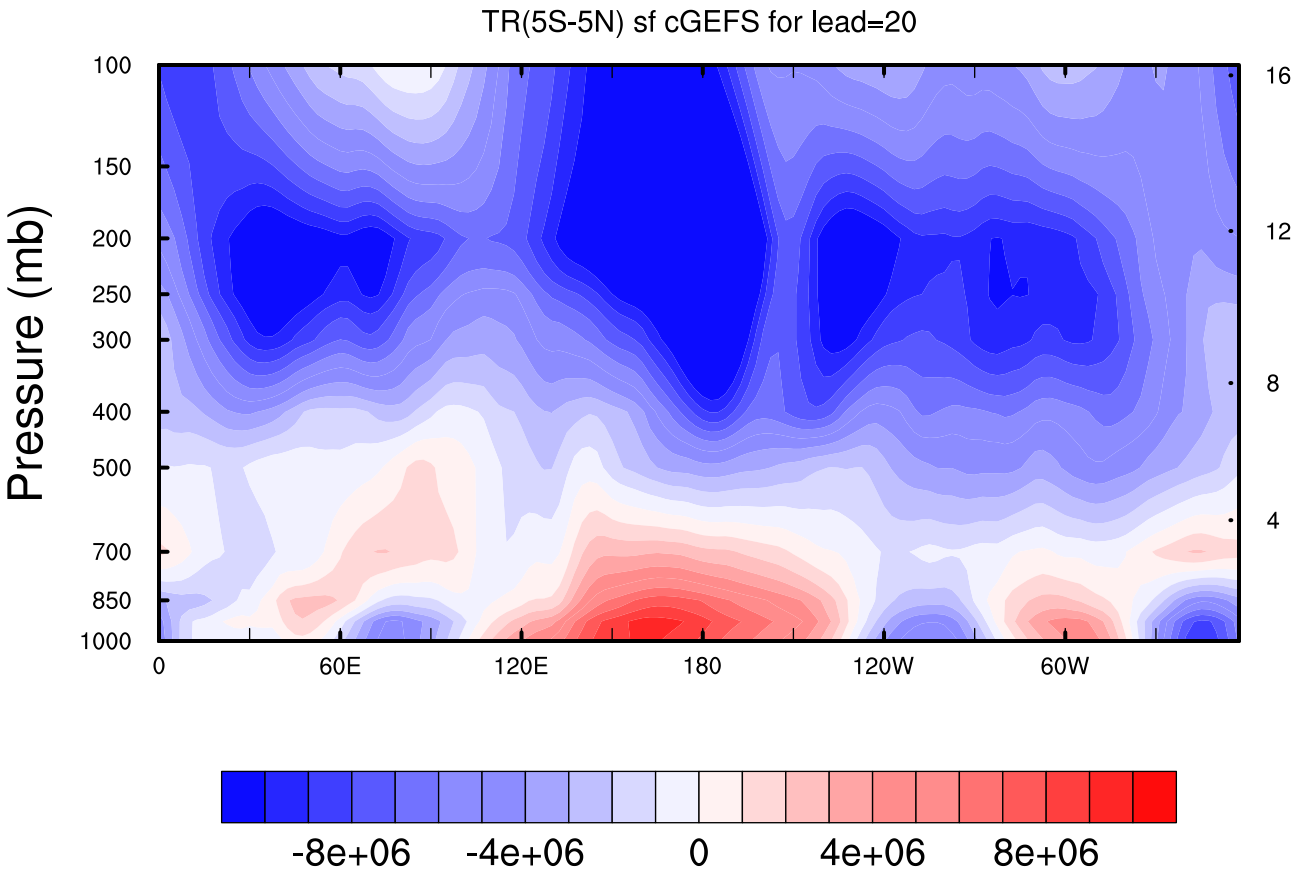
8e+06


TR(5S-5N) sf cGEFS for lead=20
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
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120E
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60W
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-4e+06
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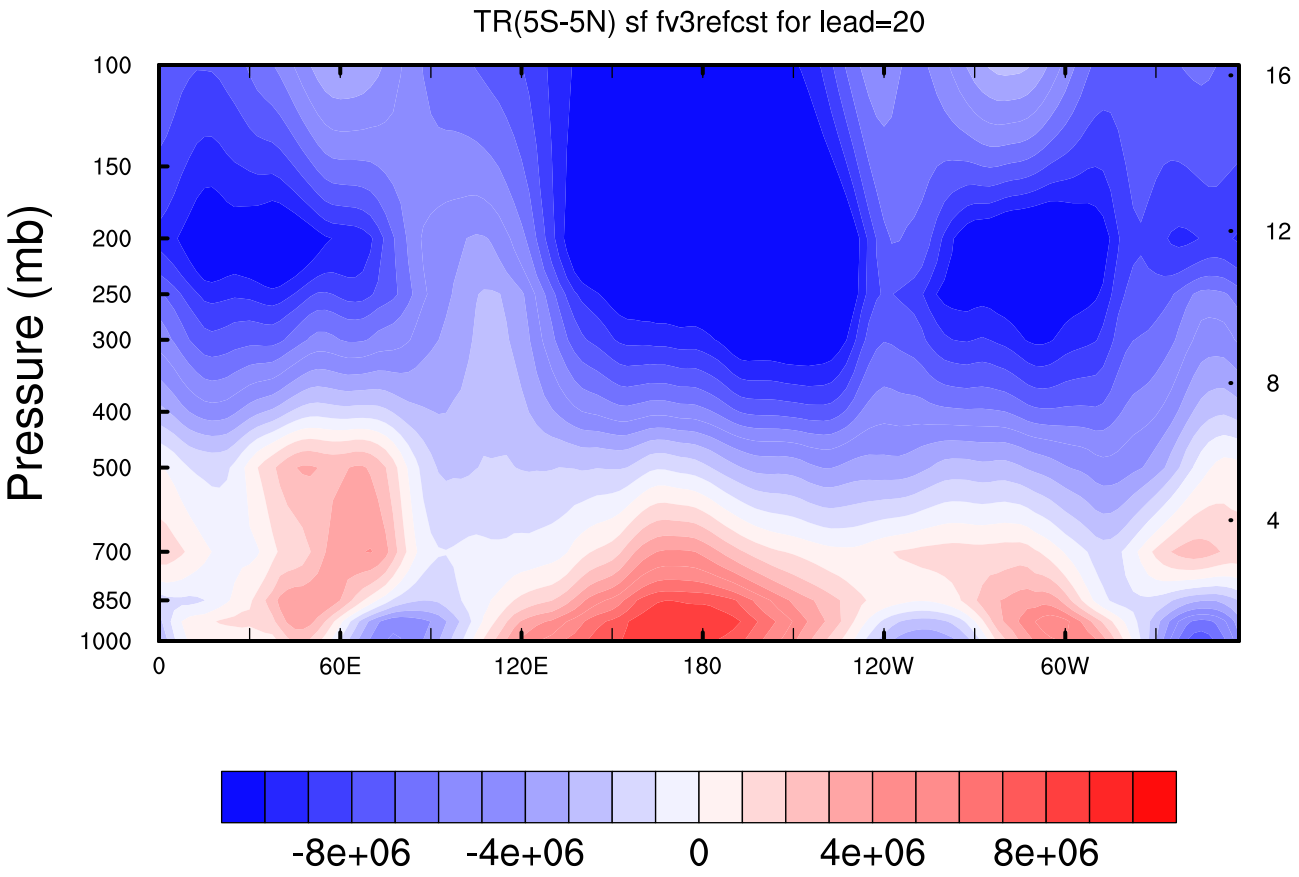
8e+06


TR(5S-5N) sf fv3refcst for lead=20
Pressure (mb)
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150
200
250
300
400
500
700
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1000
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120E
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-4e+06
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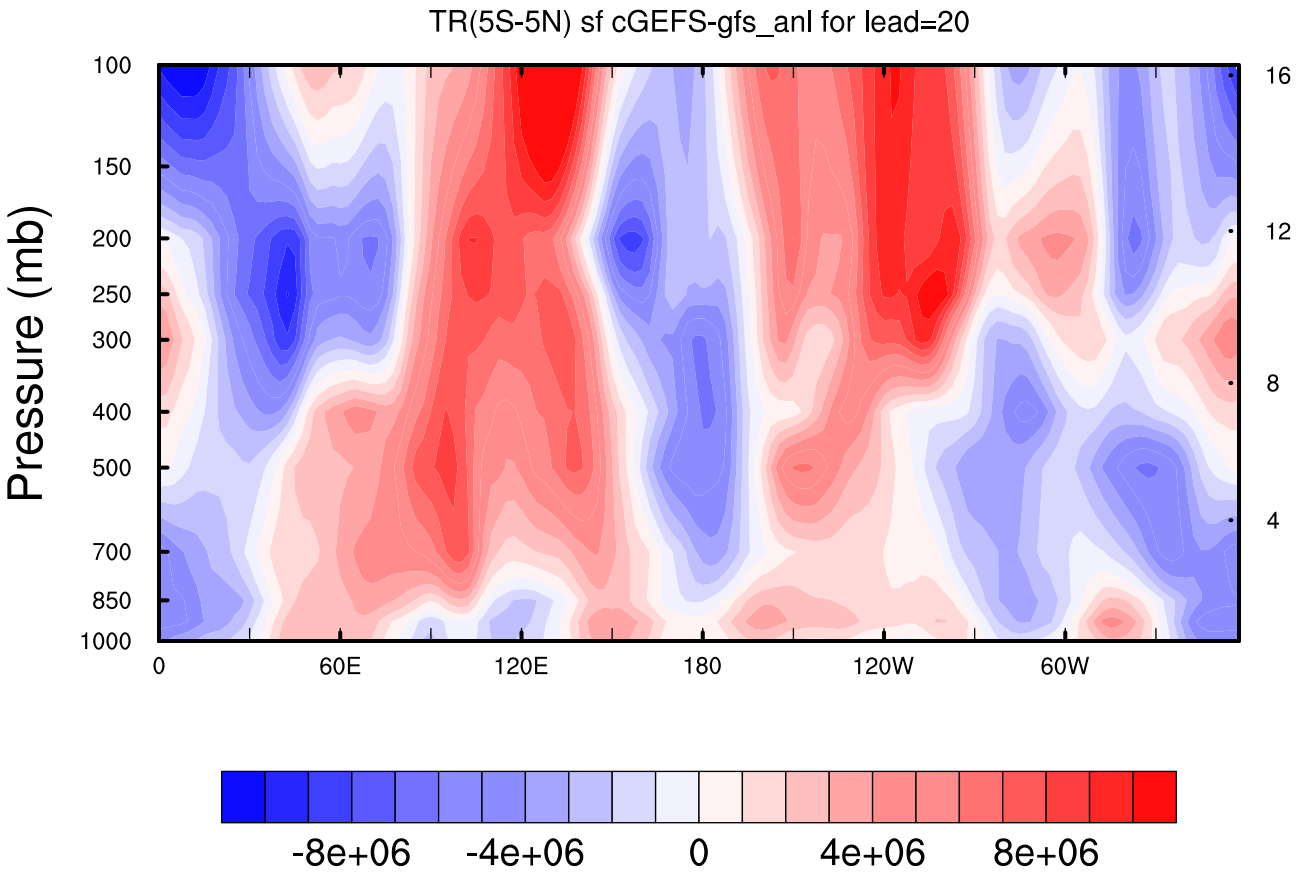
TR(5S-5N) sf cGEFS-gfs_anl for lead=20
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
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120E
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60W
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4
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-4e+06
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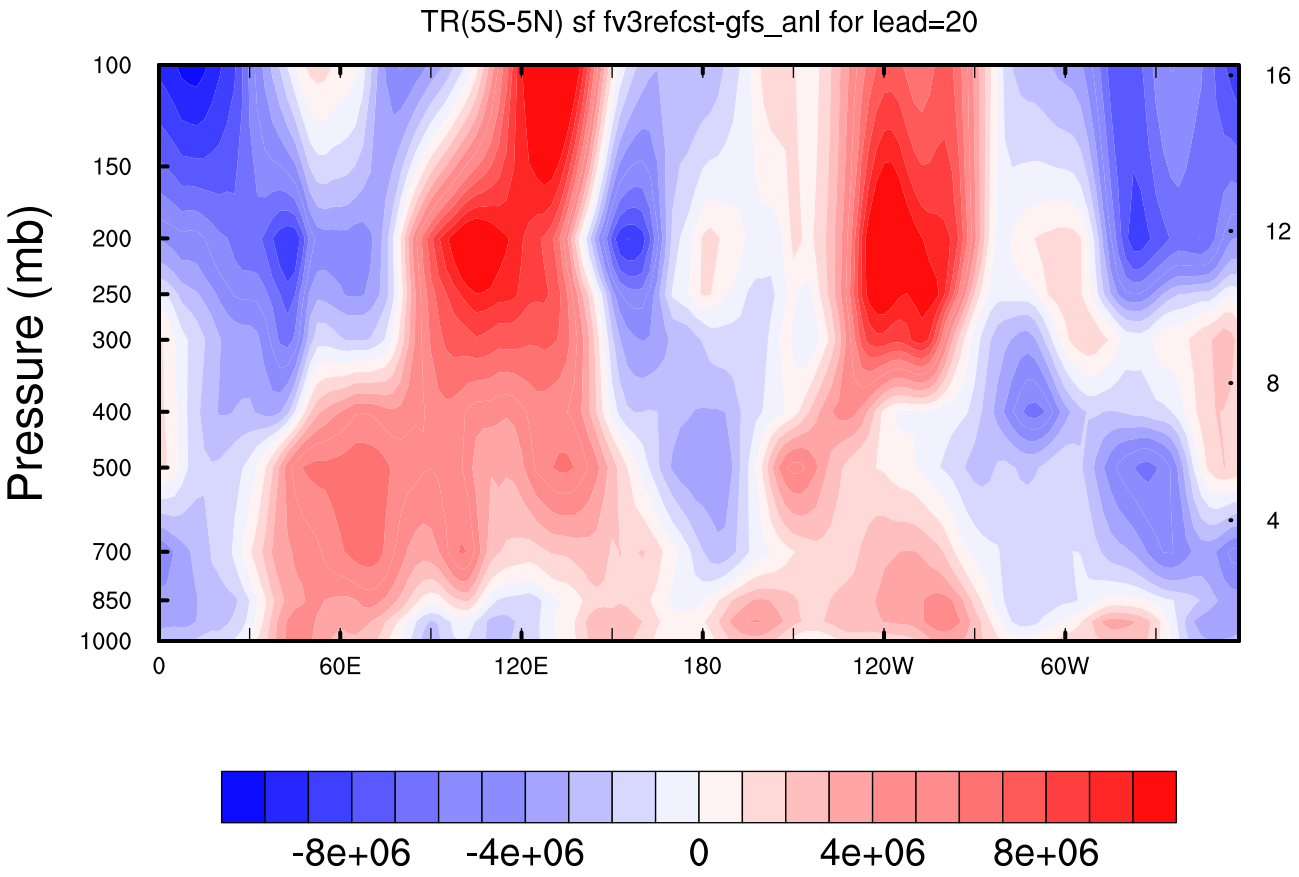
8e+06


TR(5S-5N) sf fv3refcst-gfs_anl for lead=20
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
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120E
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120W
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-4e+06
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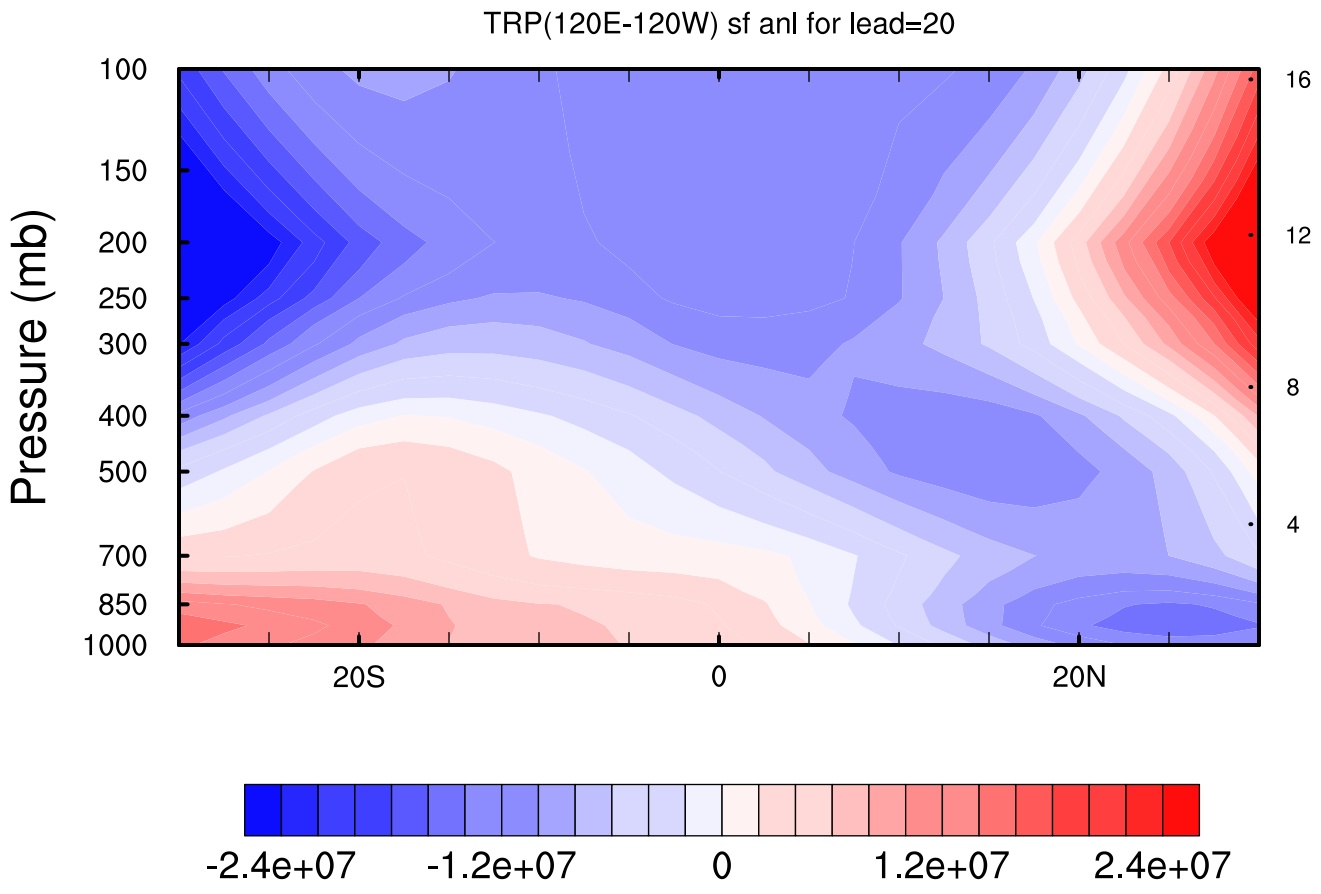
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Pressure (mb)
100
150
200
250
300
400
500
700
850
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12
8
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0
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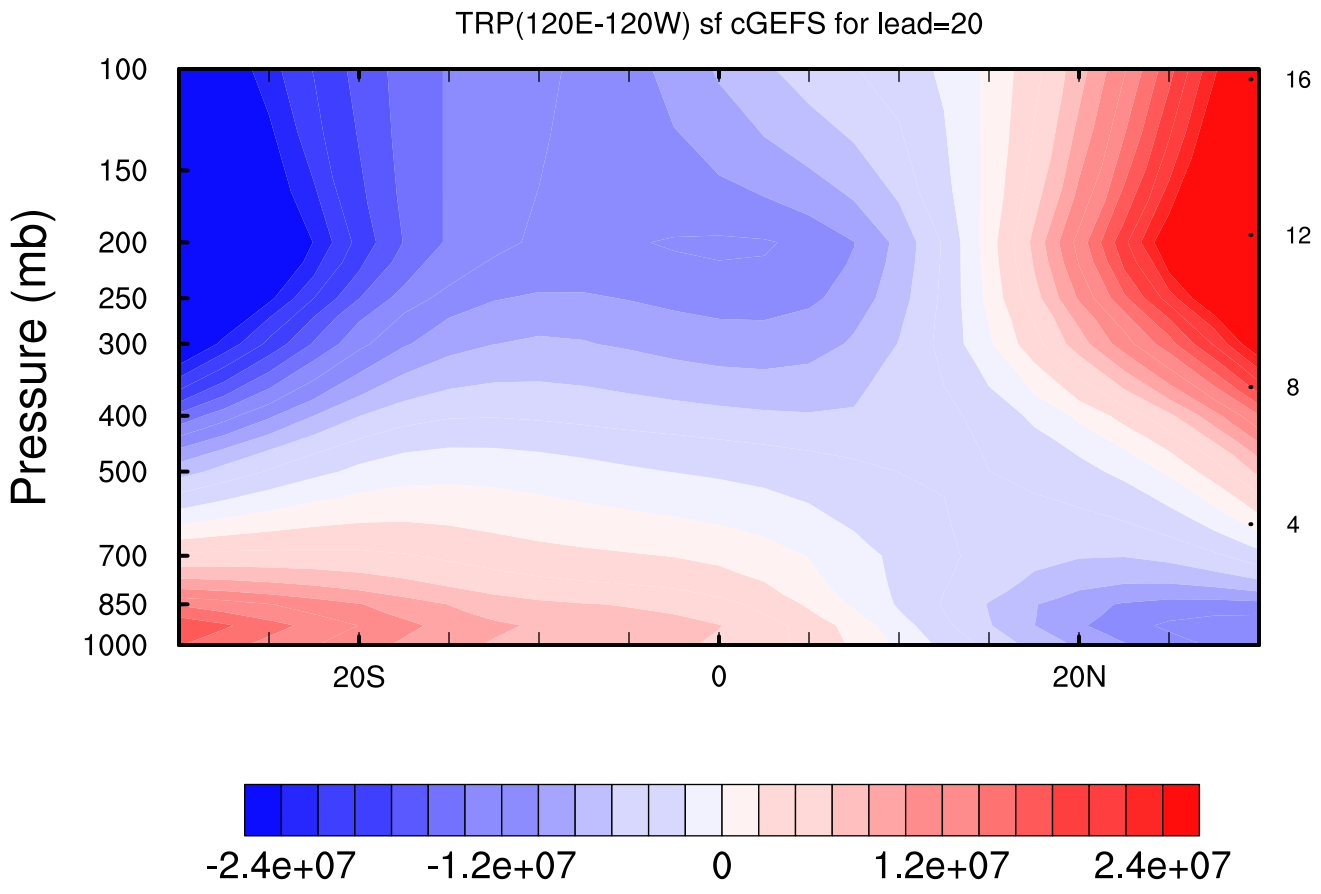
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Pressure (mb)
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200
250
300
400
500
700
850
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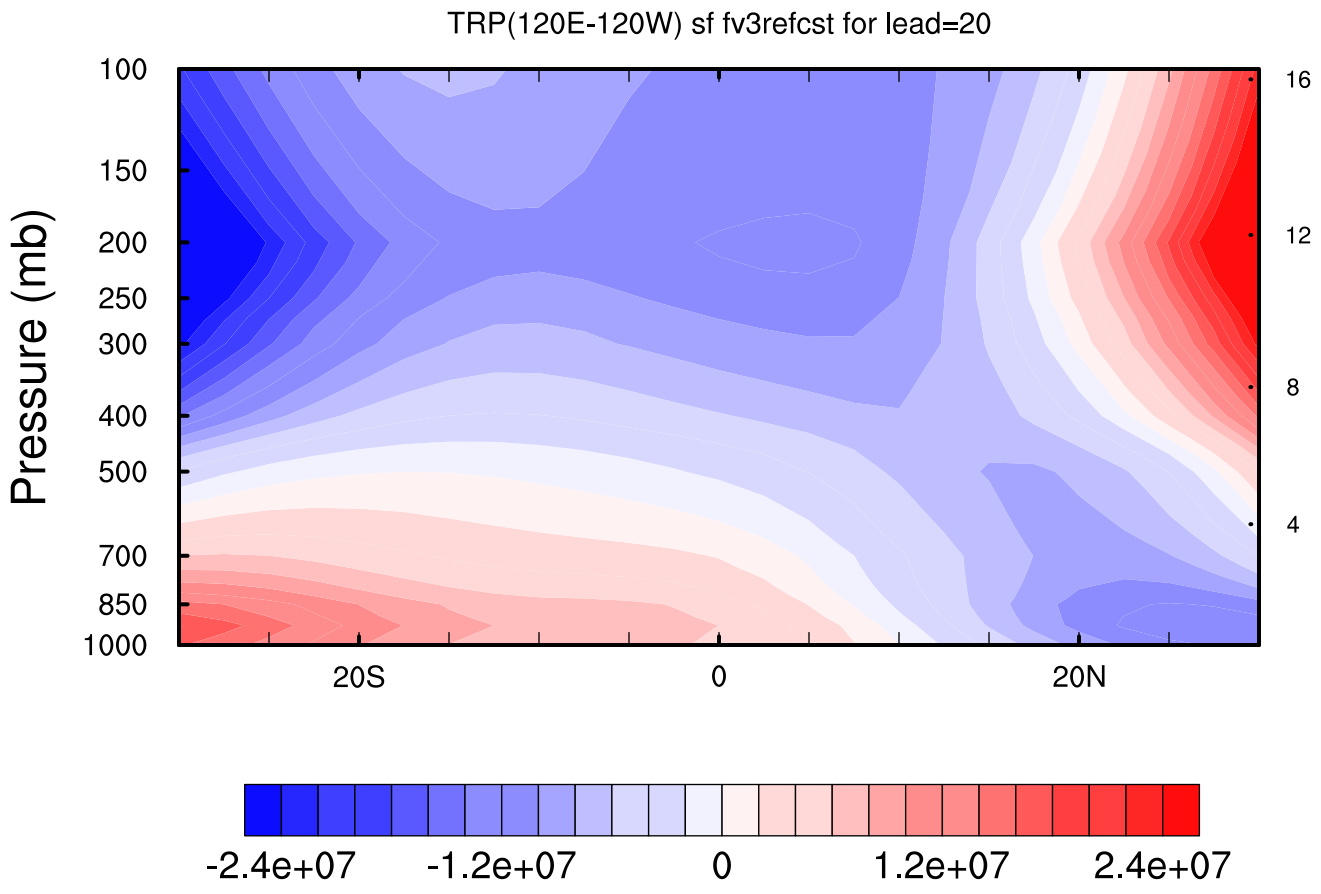
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Pressure (mb)
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200
250
300
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500
700
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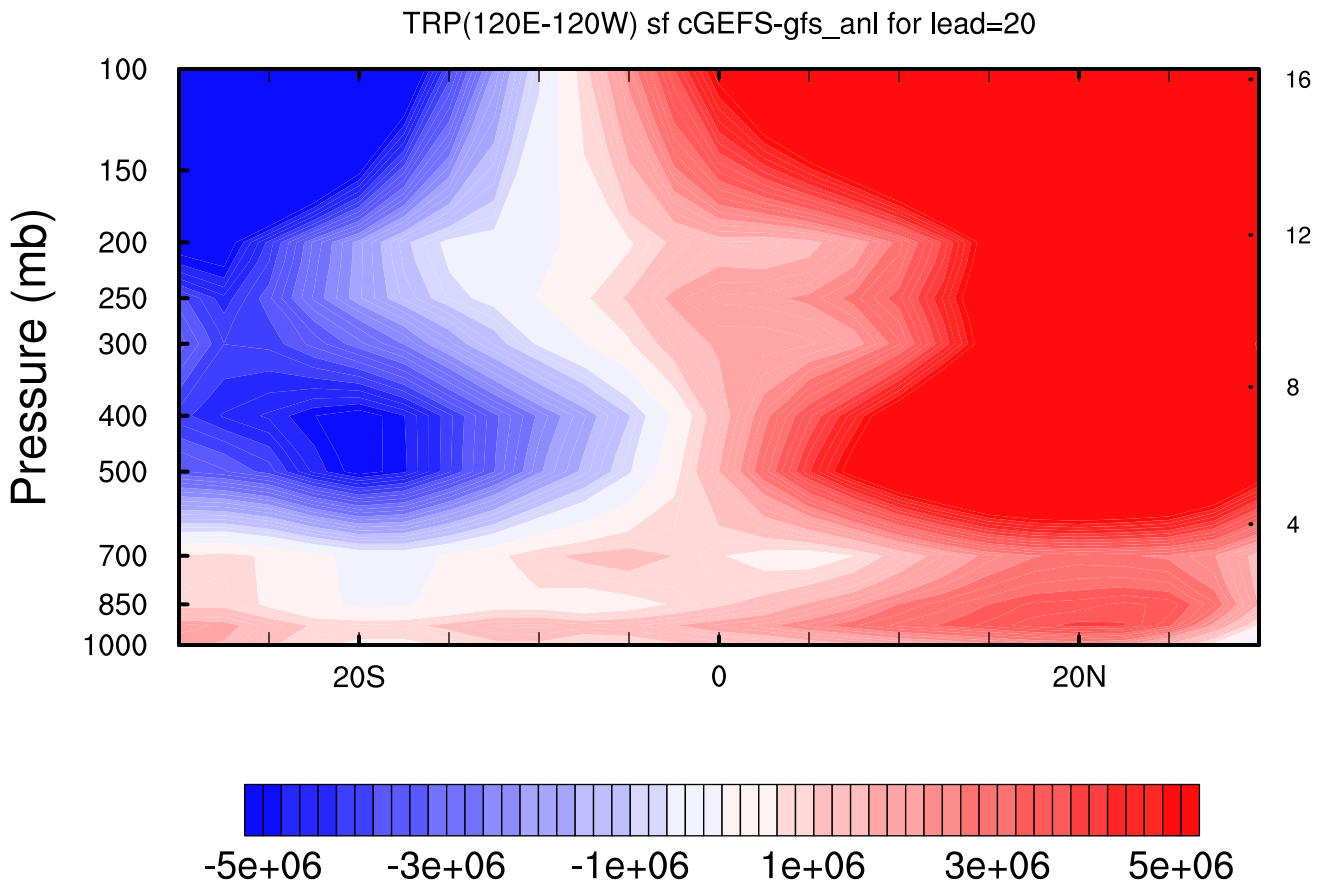
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Pressure (mb)
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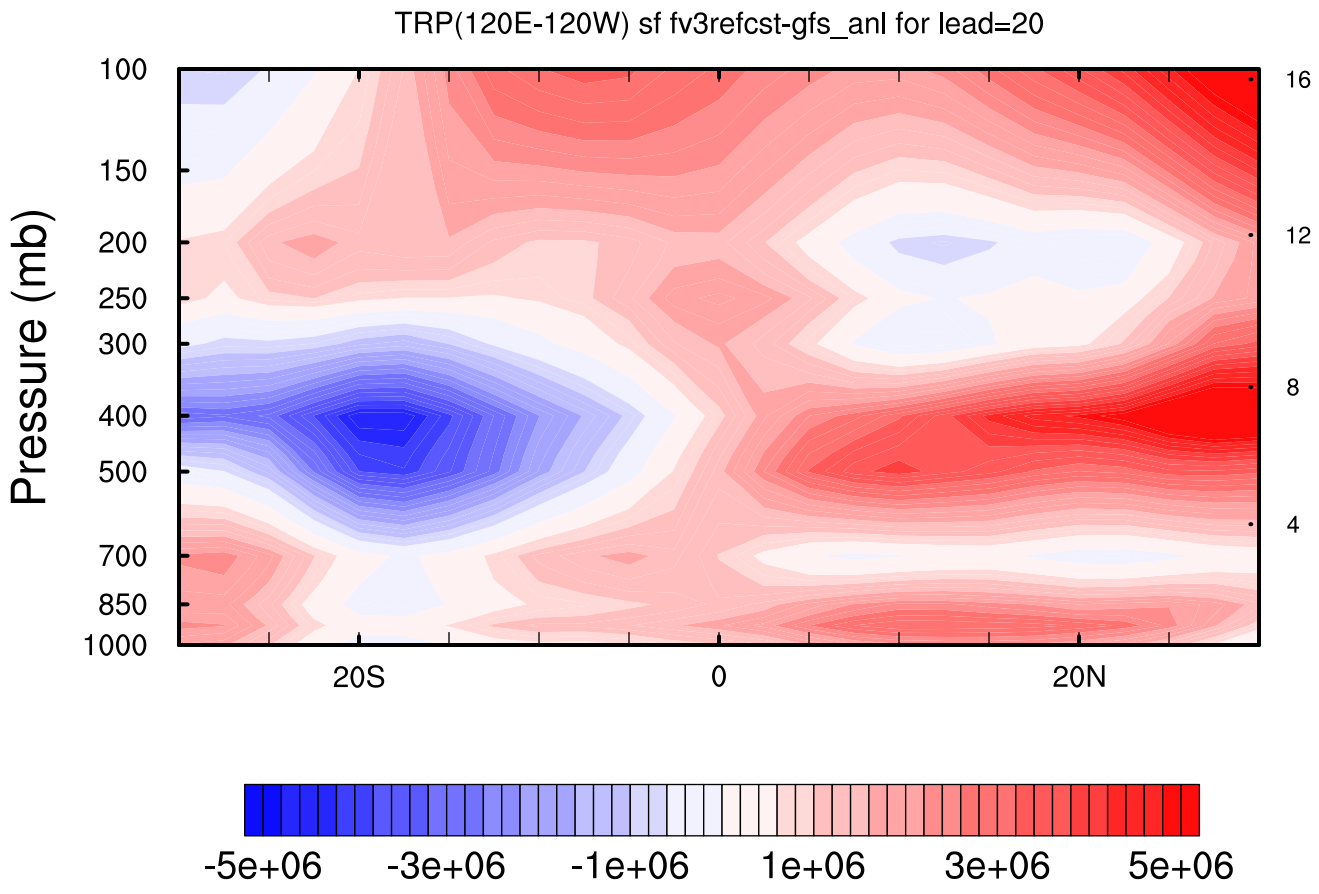
5e+06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Pressure (mb)
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1000
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-3e+06
-1e+06
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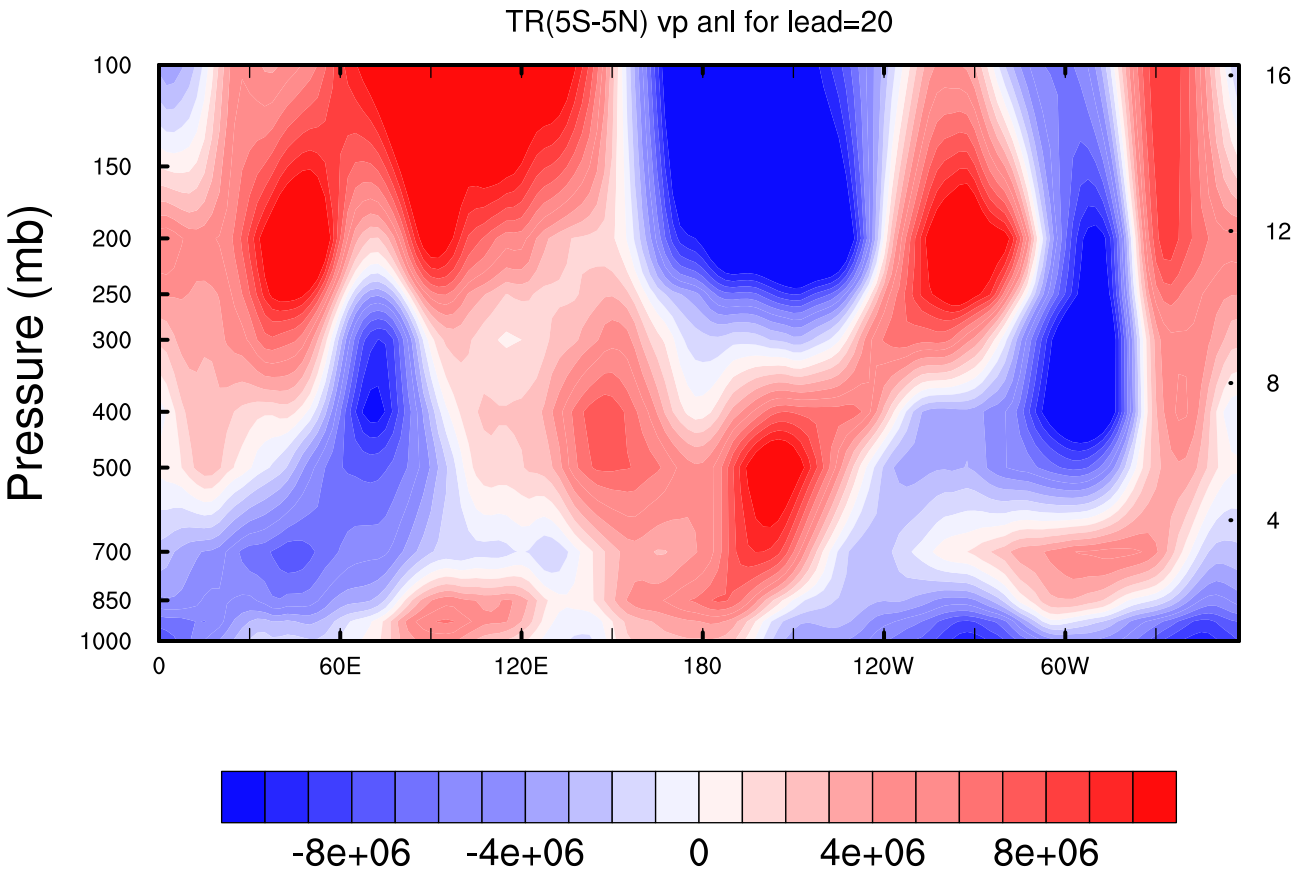
3e+06
5e+06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Pressure (mb)
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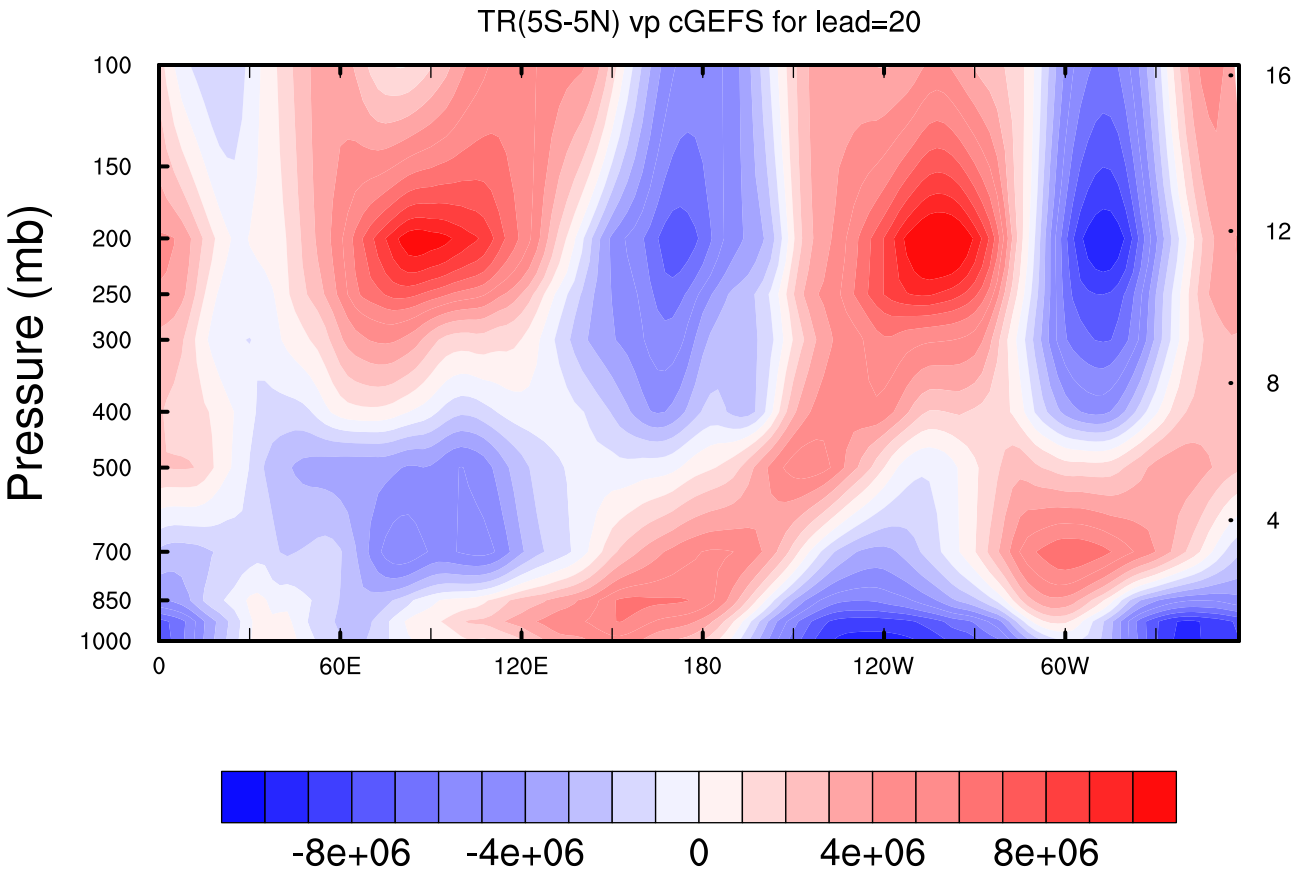
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Pressure (mb)
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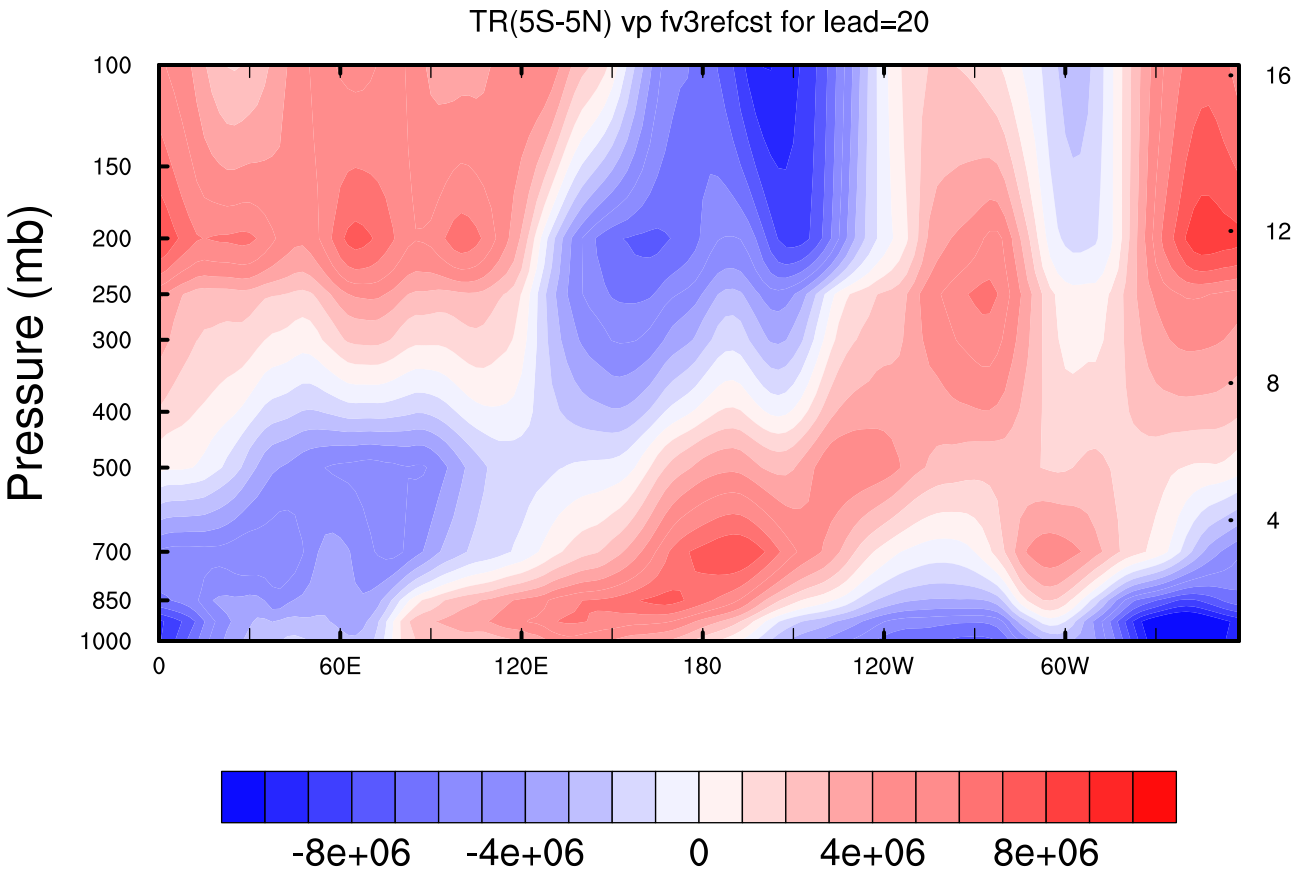
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Pressure (mb)
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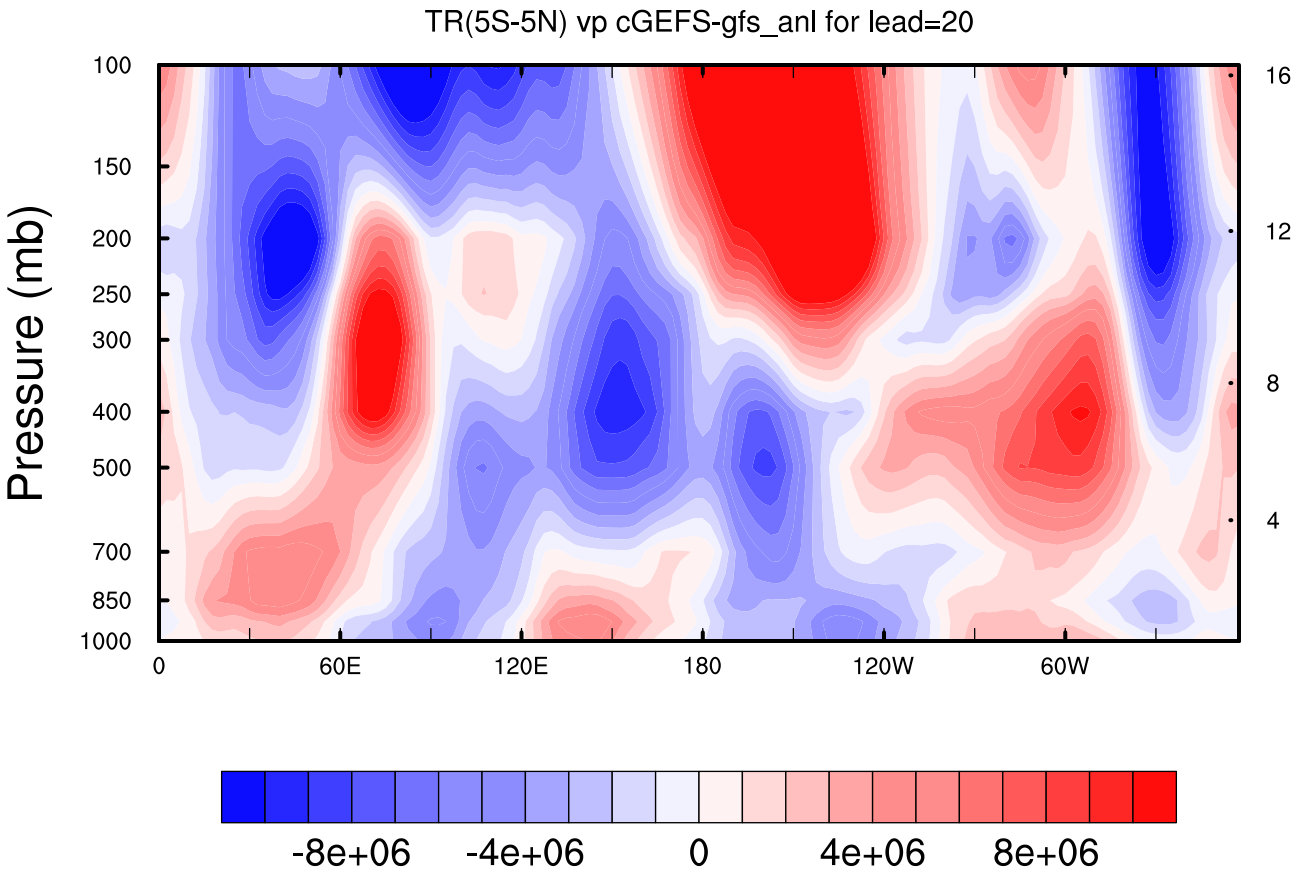
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Pressure (mb)
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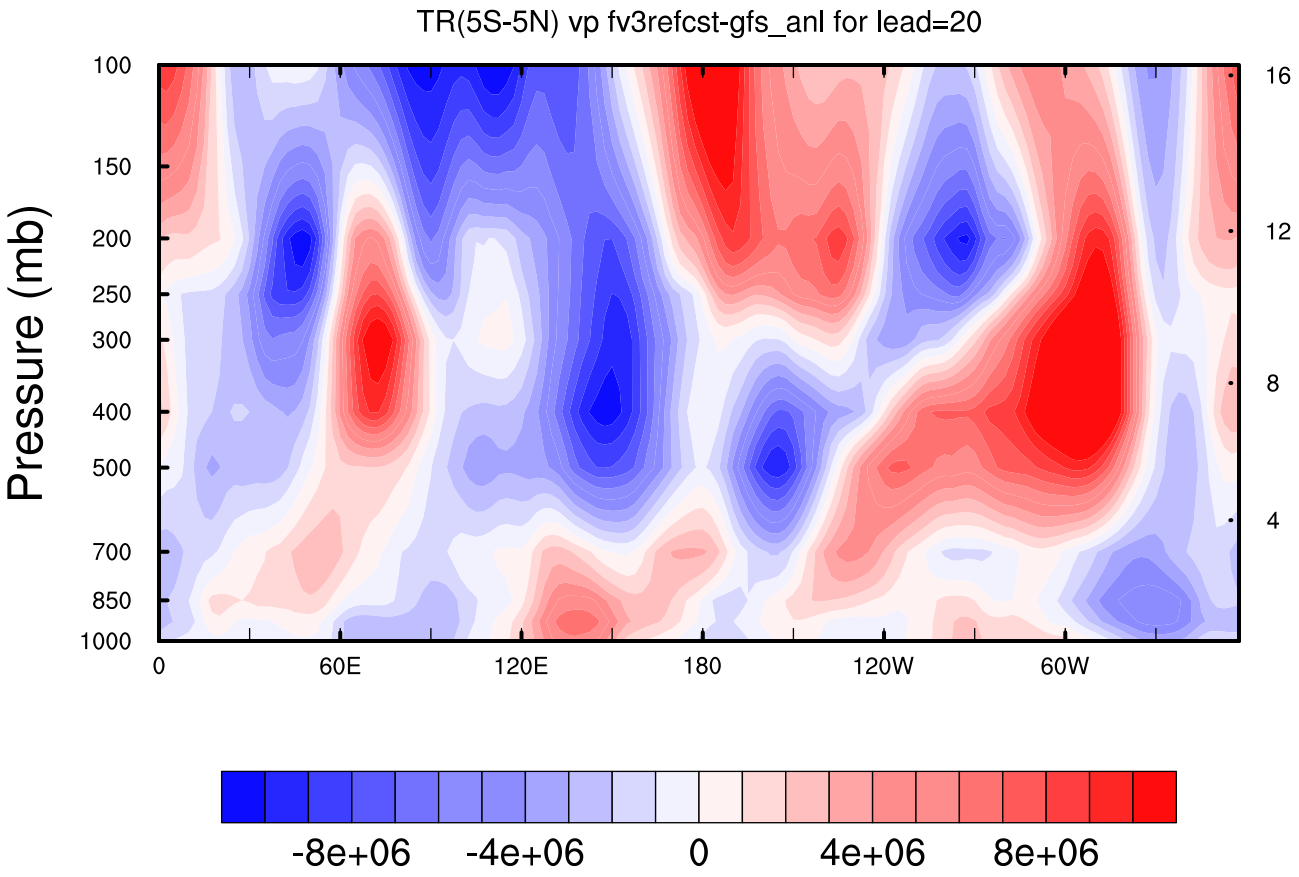
TR(5S-5N) vp fv3refcst-gfs_anl for lead=20
Pressure (mb)
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1000
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60W
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-4e+06
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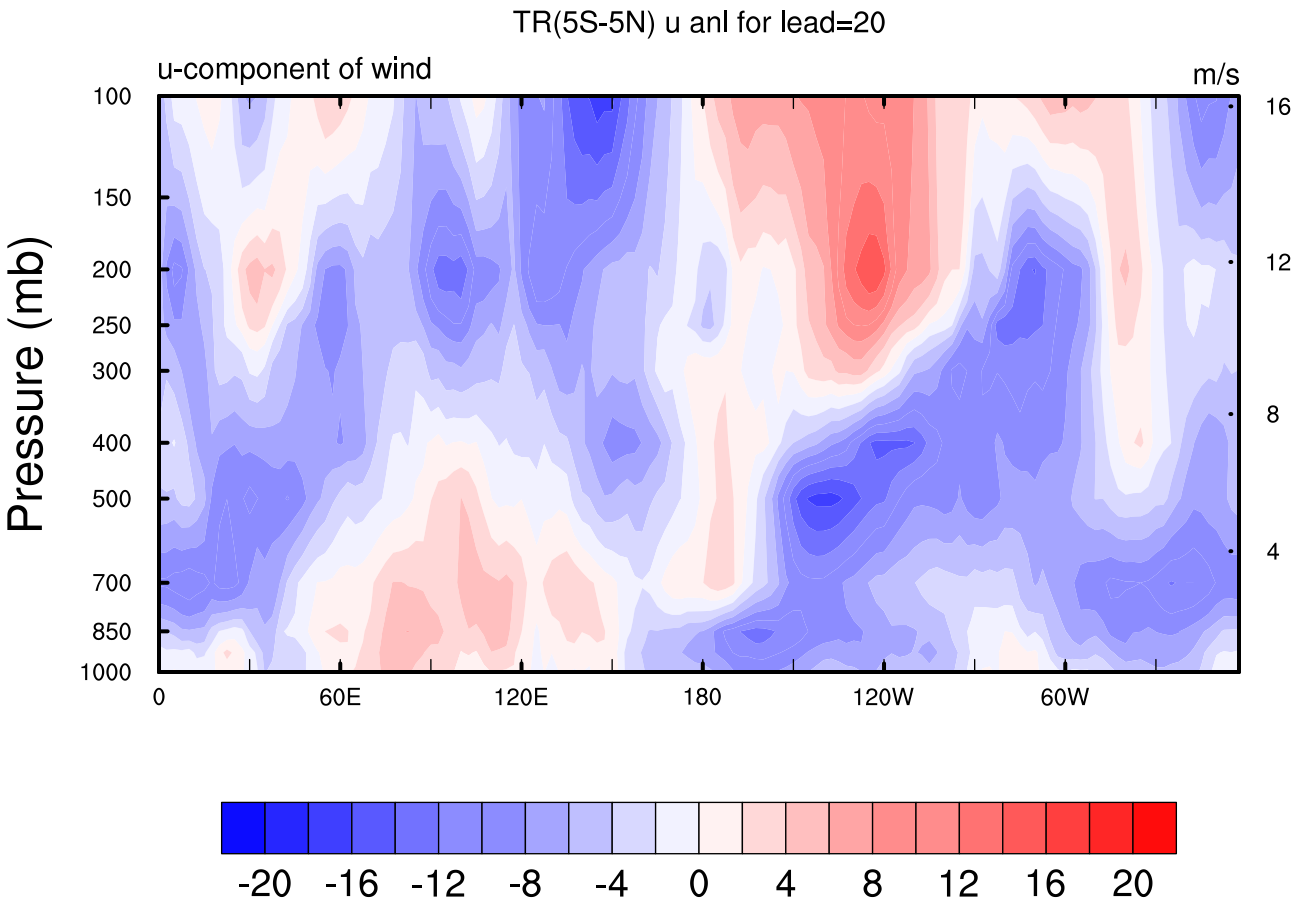
8e+06


TR(5S-5N) u anl for lead=20
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
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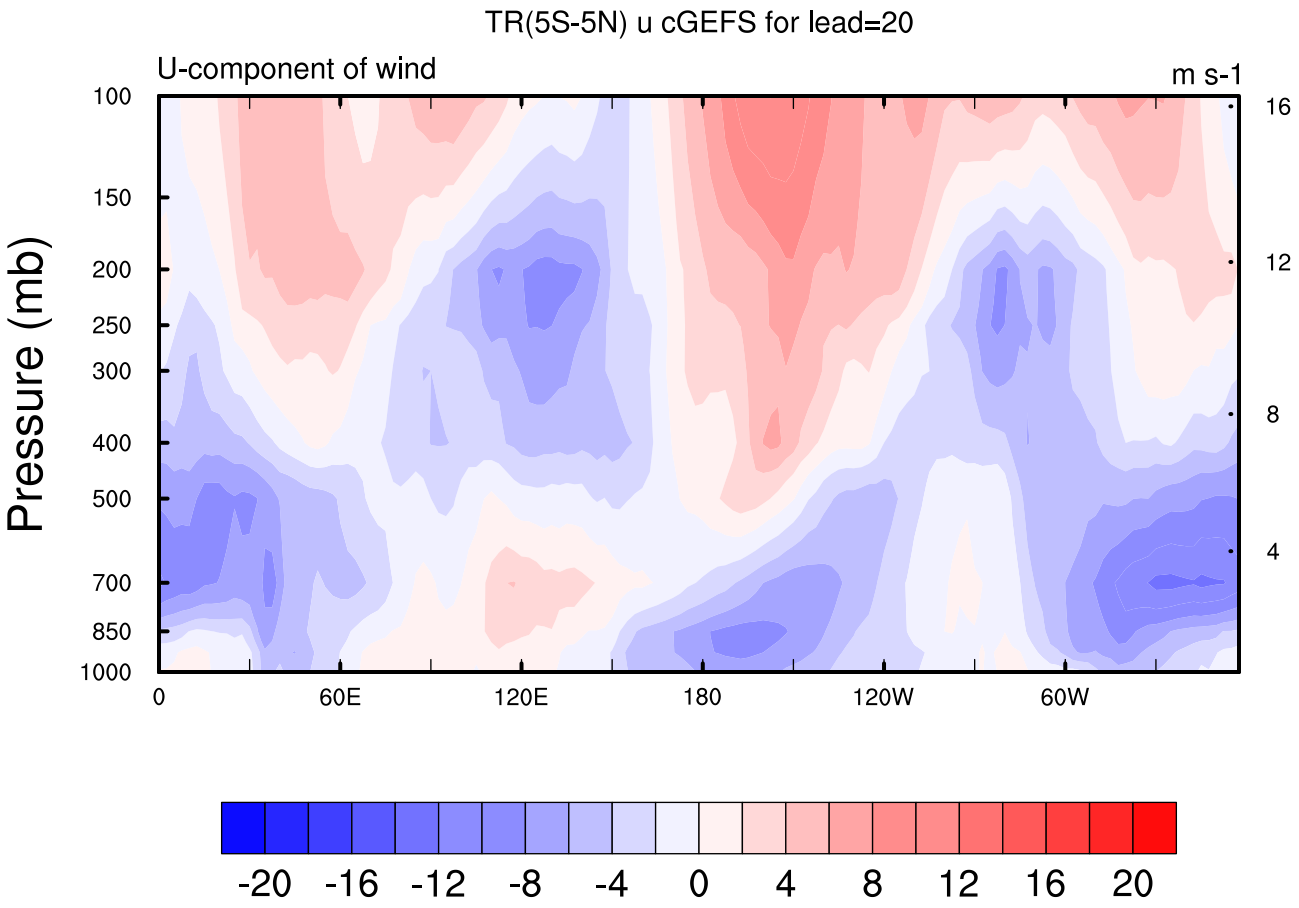
8
12
16
20


TR(5S-5N) u cGEFS for lead=20
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
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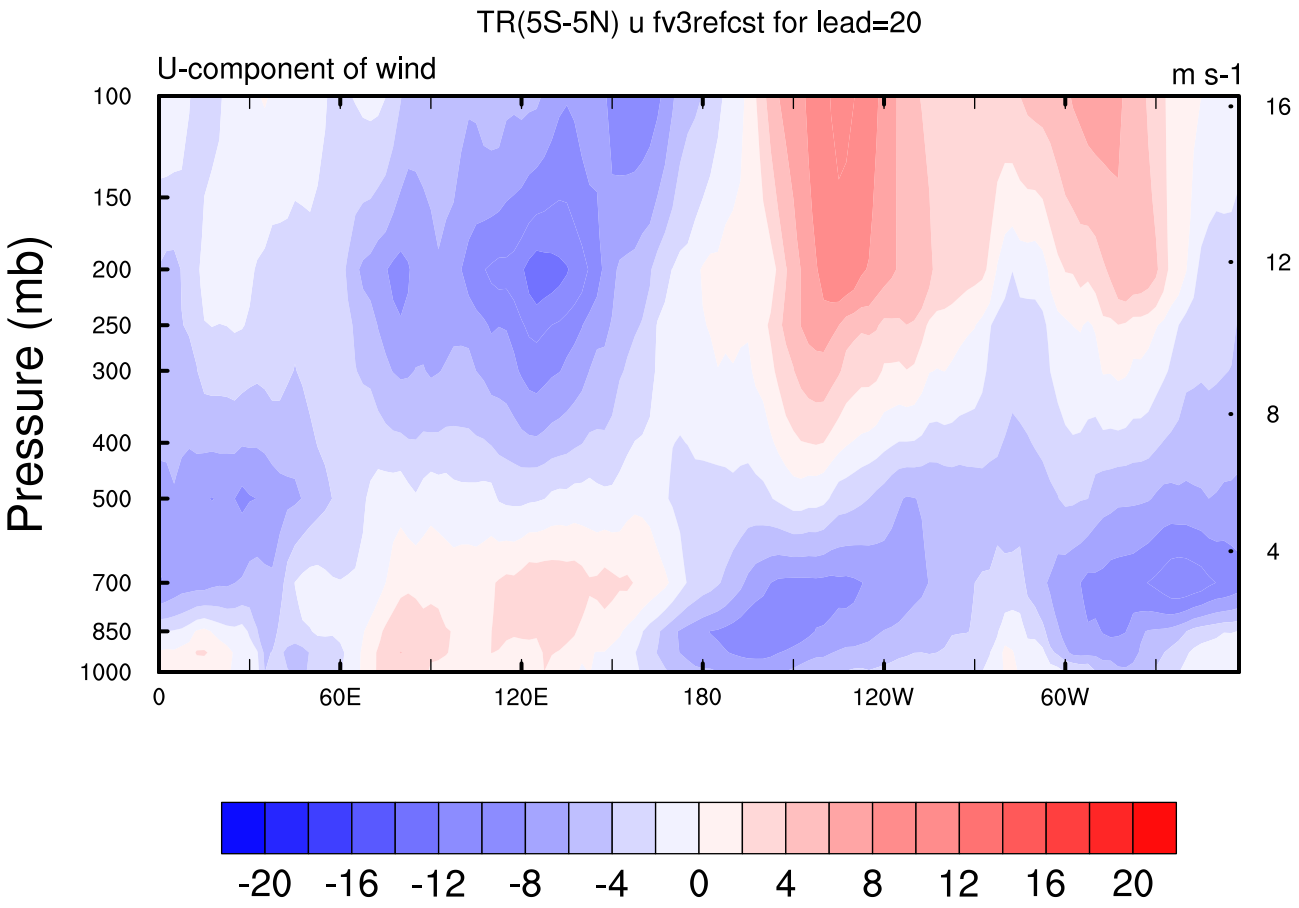
4
8
12
16
20


TR(5S-5N) u fv3refcst for lead=20
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
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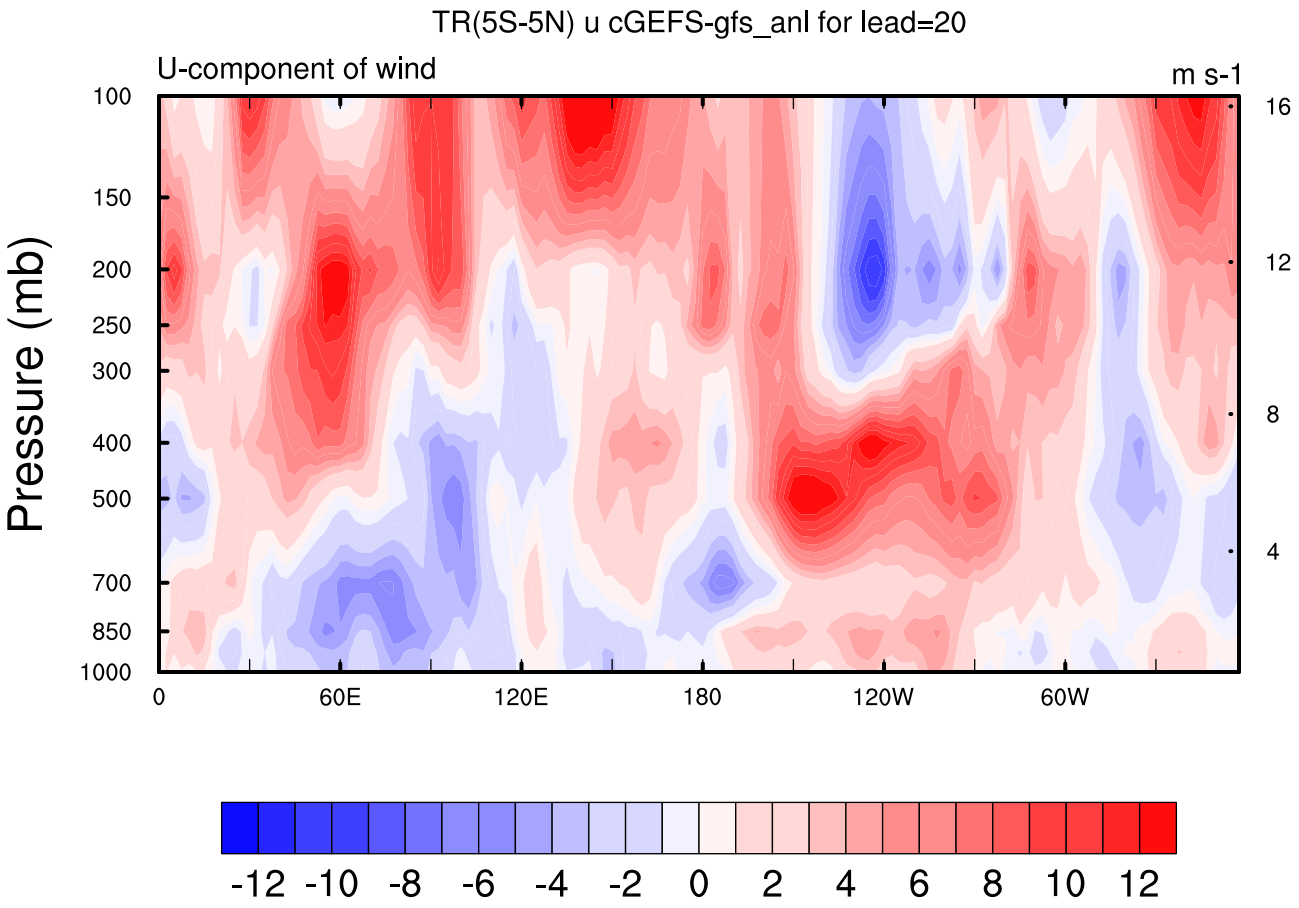
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=20
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
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-12
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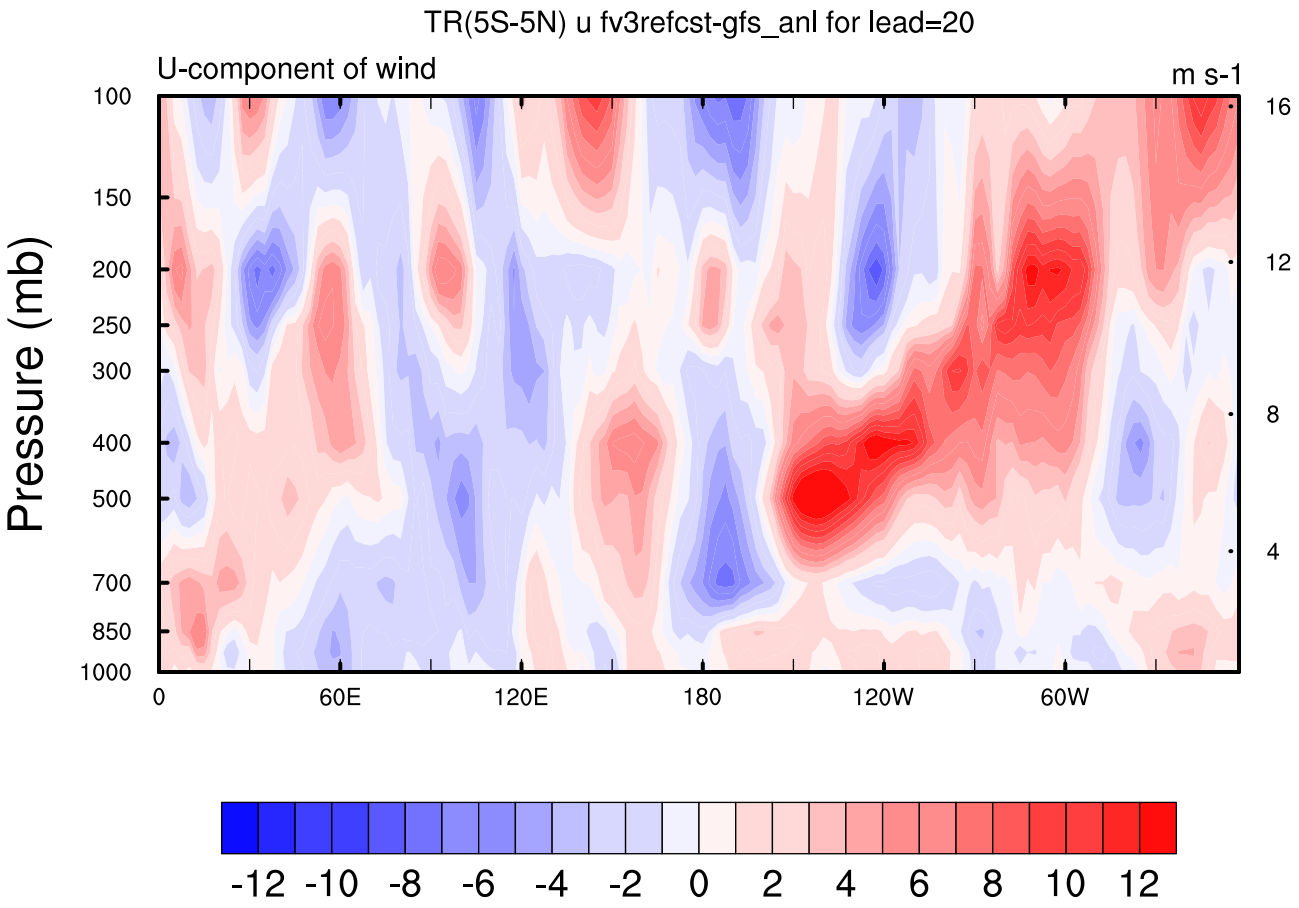
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=20
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
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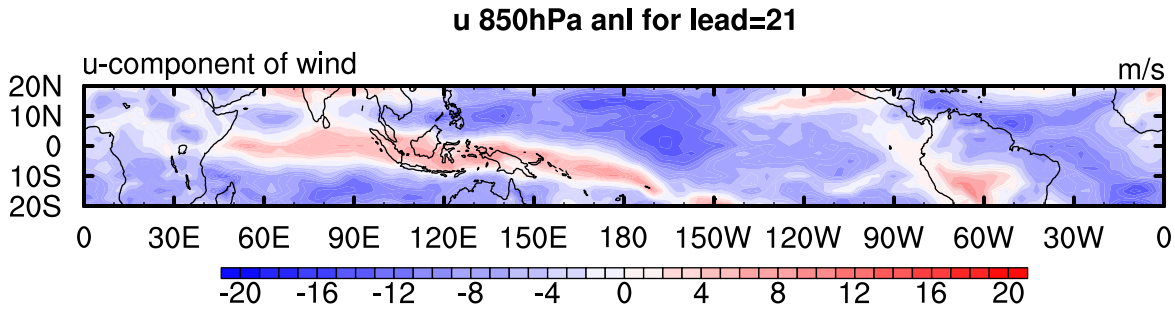
u 850hPa anl for lead=21
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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30W
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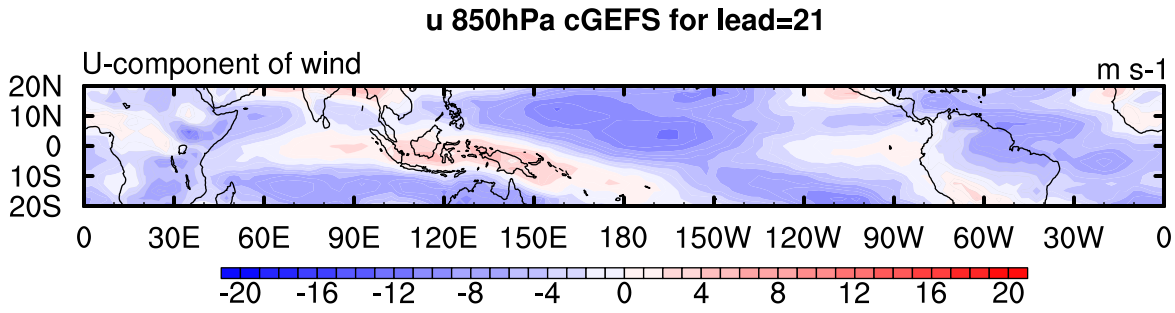
-12
-8
-4
0
4
8
12
16
20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U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-4
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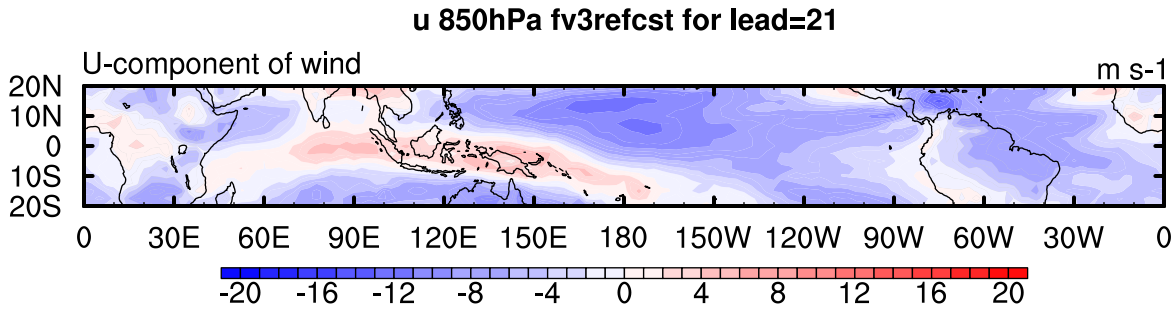
8
12
16
20


u 850hPa fv3refcst for lead=21
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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8
12
16
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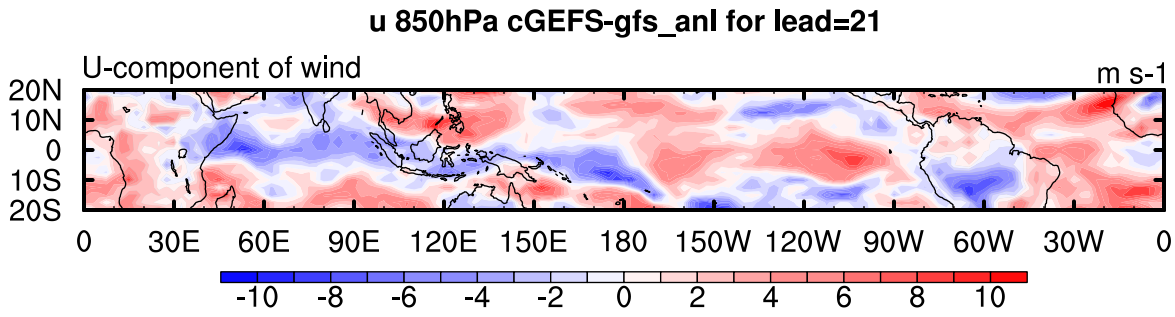
u 850hPa cGEFS-gfs_anl for lead=21
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-2
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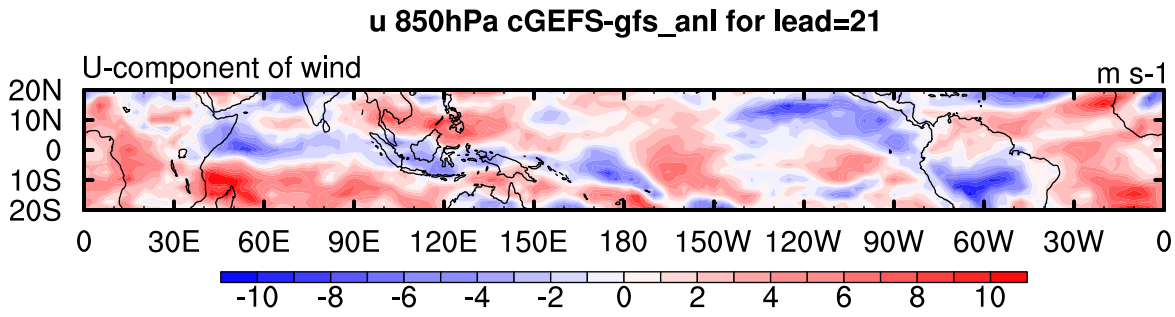
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U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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8
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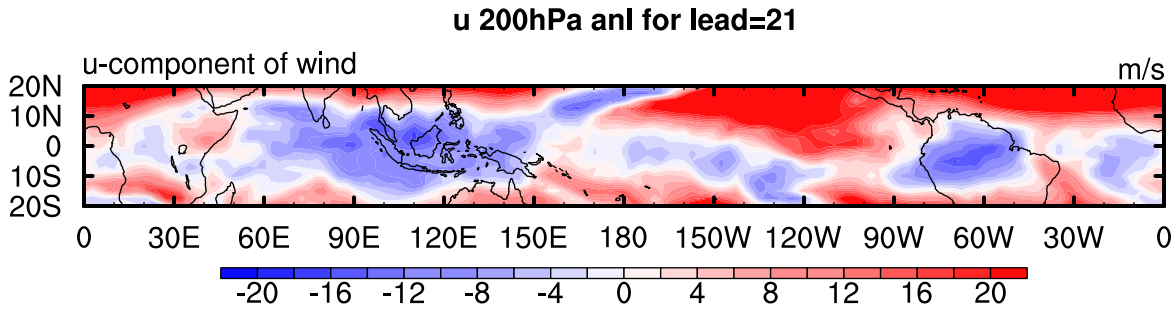
u 200hPa anl for lead=21
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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16
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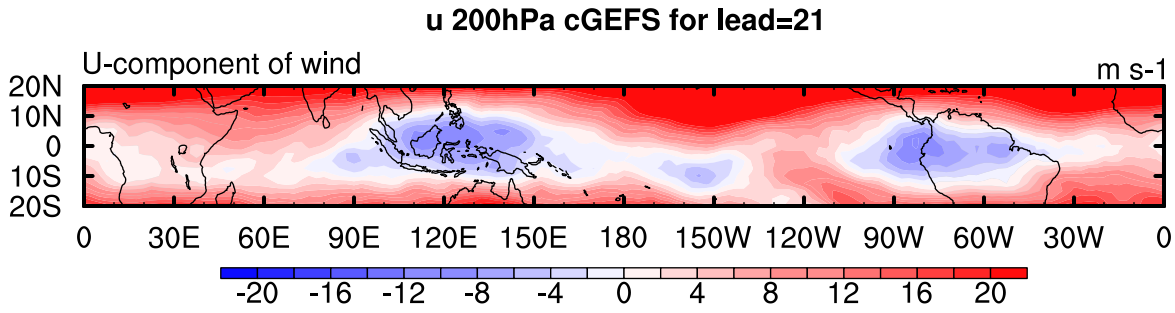
u 200hPa cGEFS for lead=21
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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0
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16
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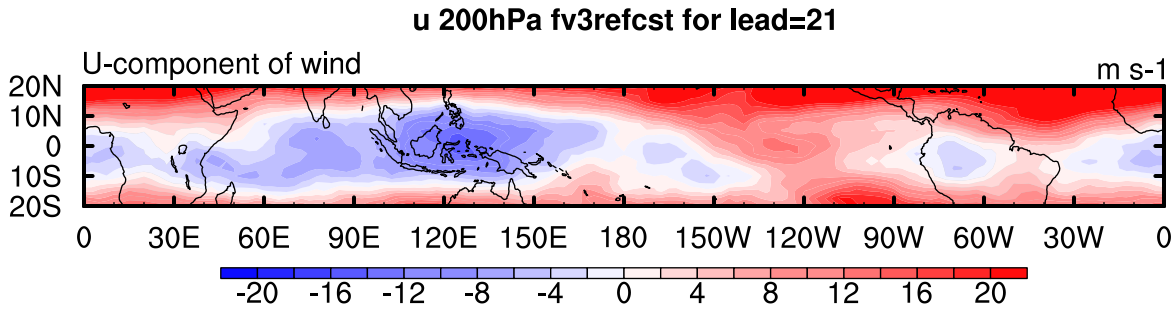
u 200hPa fv3refcst for lead=21
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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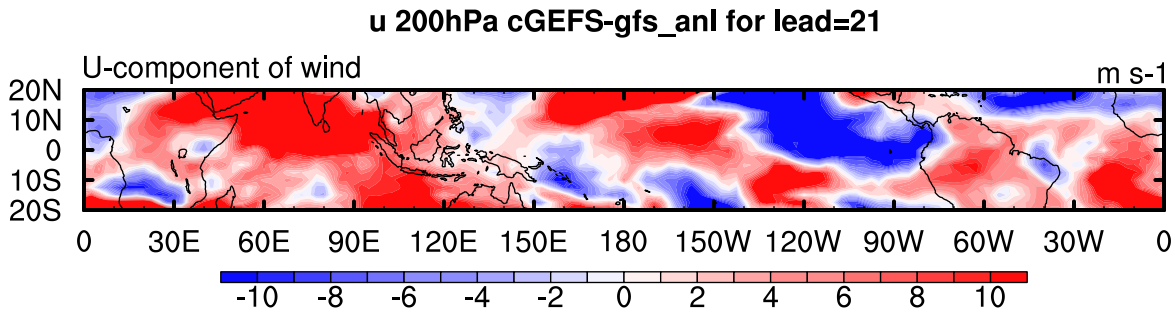
u 200hPa cGEFS-gfs_anl for lead=21
U-component of wind
m s-1
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10N
0
10S
20S
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30E
60E
90E
120E
150E
180
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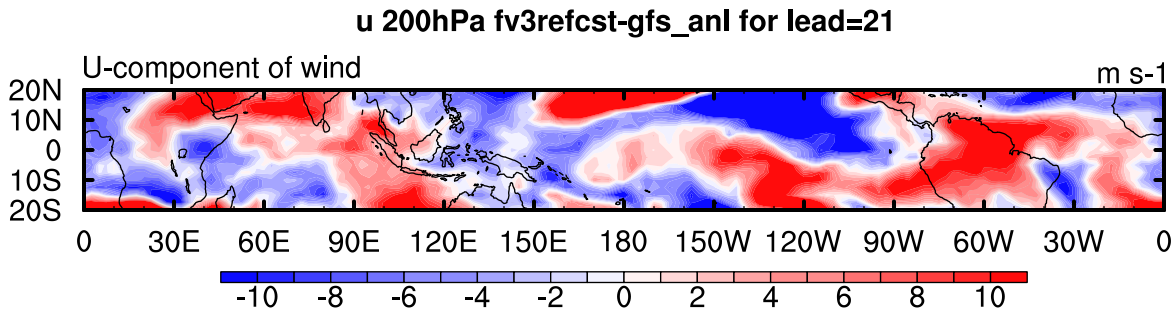
u 200hPa fv3refcst-gfs_anl for lead=21
U-component of wind
m s-1
20N
10N
0
10S
20S
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30E
60E
90E
120E
150E
180
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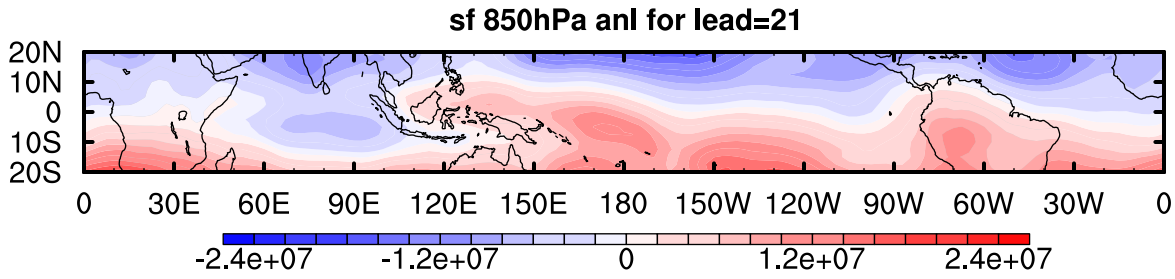
sf 850hPa anl for lead=21
20N
10N
0
10S
20S
0
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60E
90E
120E
150E
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120W
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60W
30W
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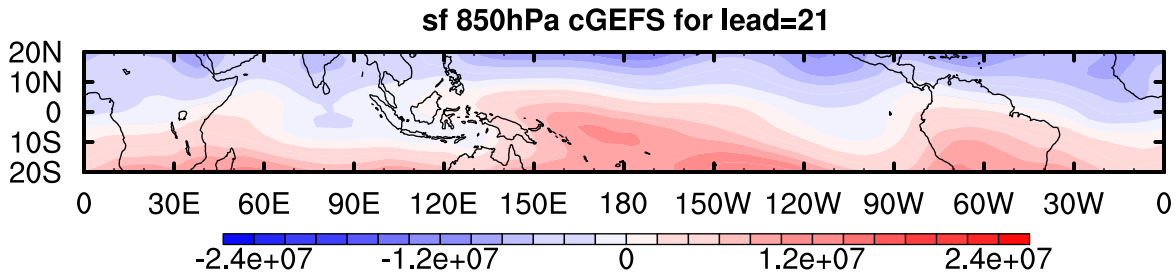
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=21
20N
10N
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10S
20S
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30E
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90E
120E
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30W
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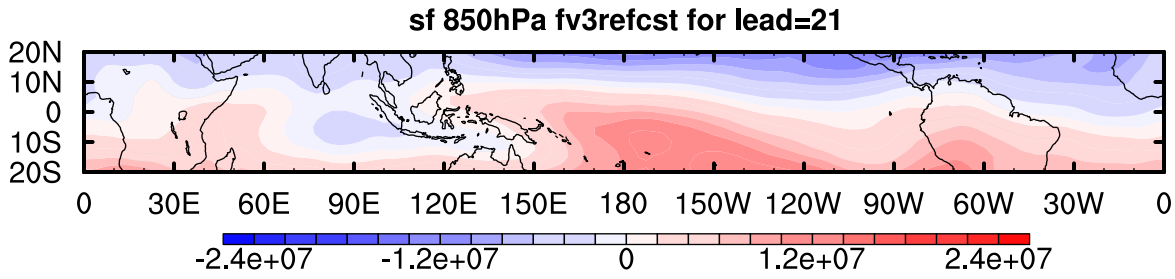
2.4e+07


sf 850hPa fv3refcst for lead=21
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10N
0
10S
20S
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30E
60E
90E
120E
150E
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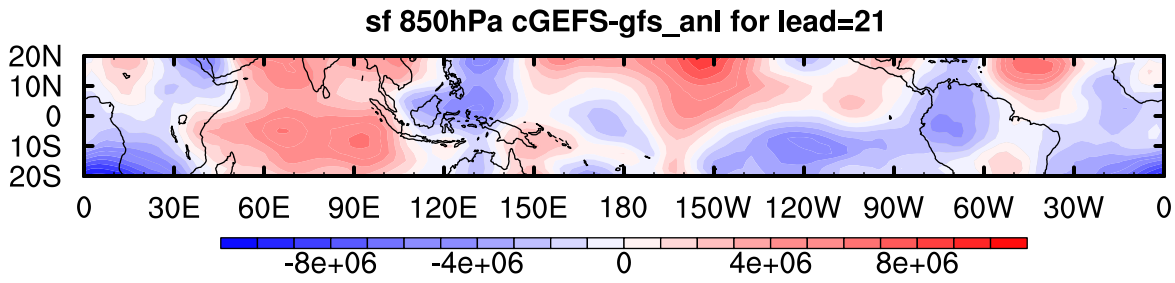
sf 850hPa cGEFS-gfs_anl for lead=21
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10N
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10S
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-4e+06
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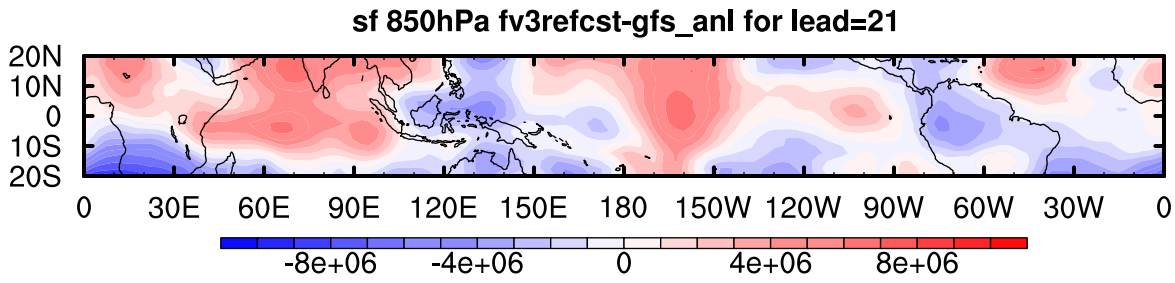
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=21
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10N
0
10S
20S
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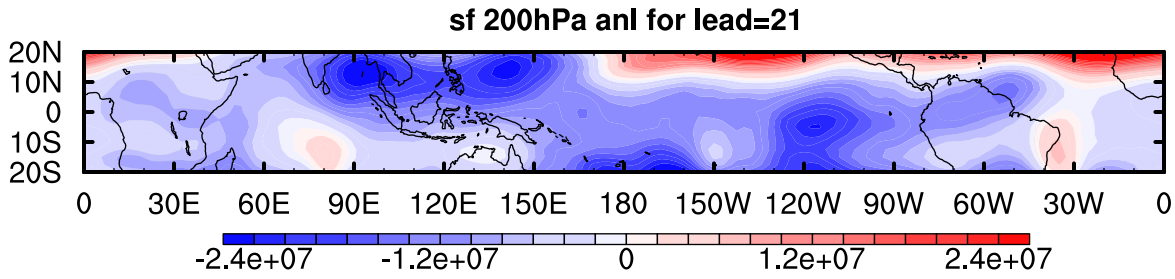
sf 200hPa anl for lead=21
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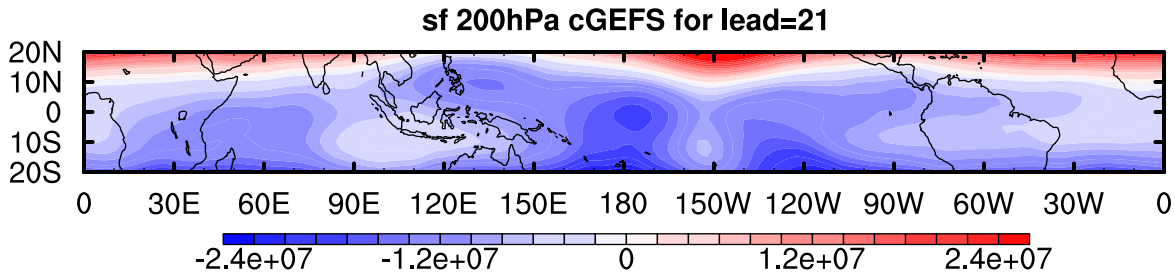
sf 200hPa cGEFS for lead=21
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10S
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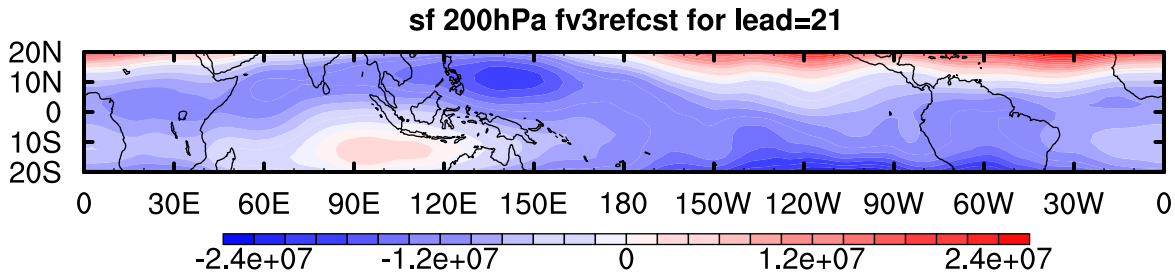
sf 200hPa fv3refcst for lead=21
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10N
0
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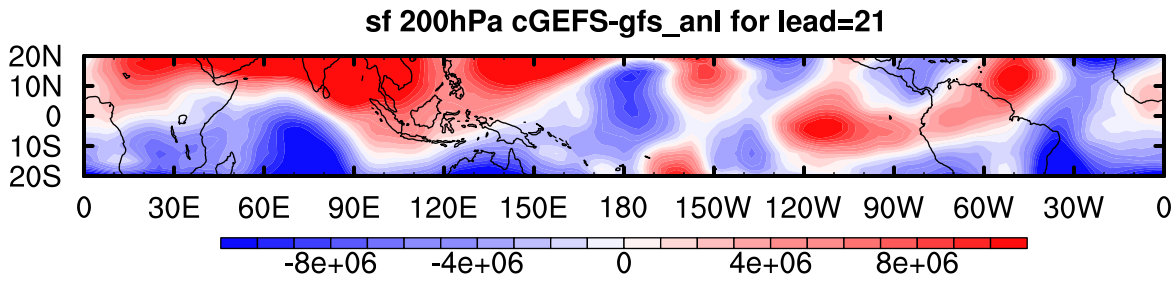
sf 200hPa cGEFS-gfs_anl for lead=21
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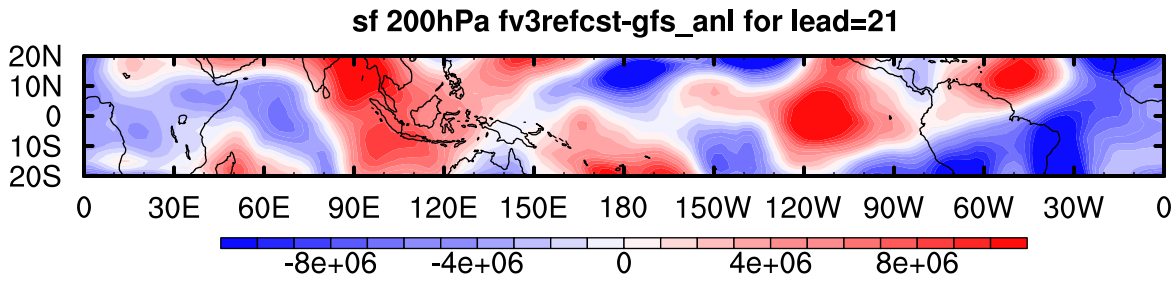
sf 200hPa fv3refcst-gfs_anl for lead=21
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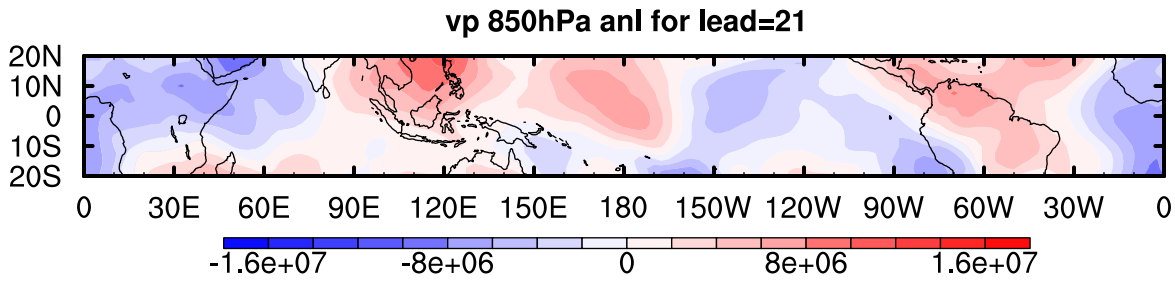
vp 850hPa anl for lead=21
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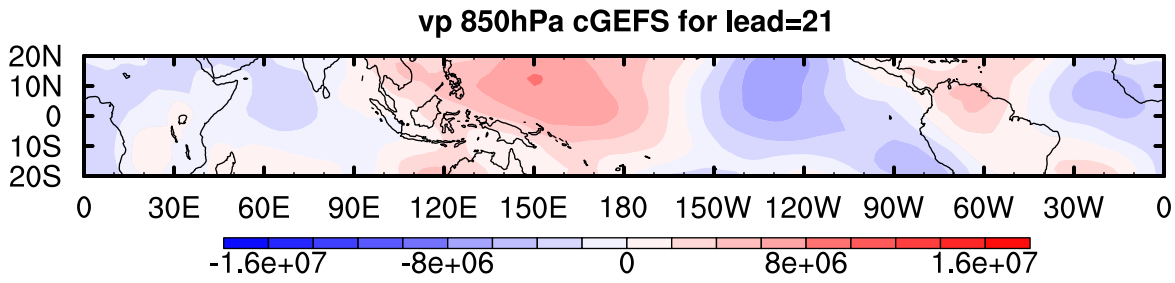
vp 850hPa cGEFS for lead=21
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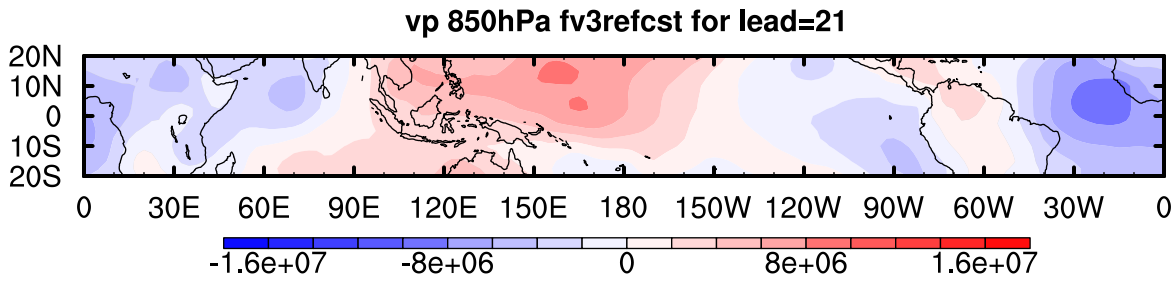
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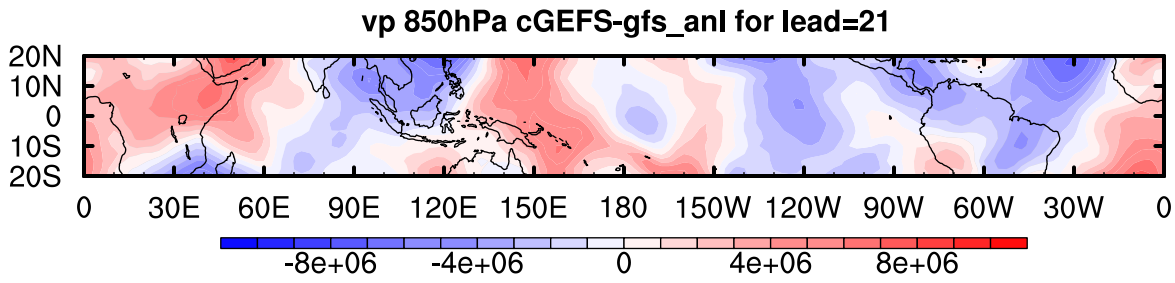
vp 850hPa cGEFS-gfs_anl for lead=21
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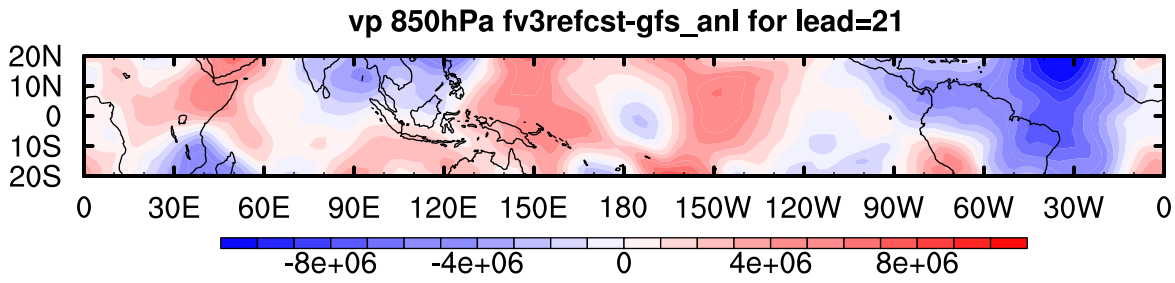
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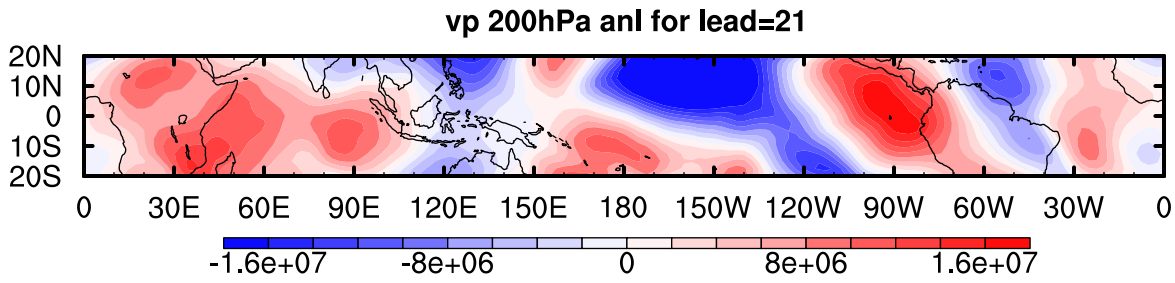
vp 200hPa anl for lead=21
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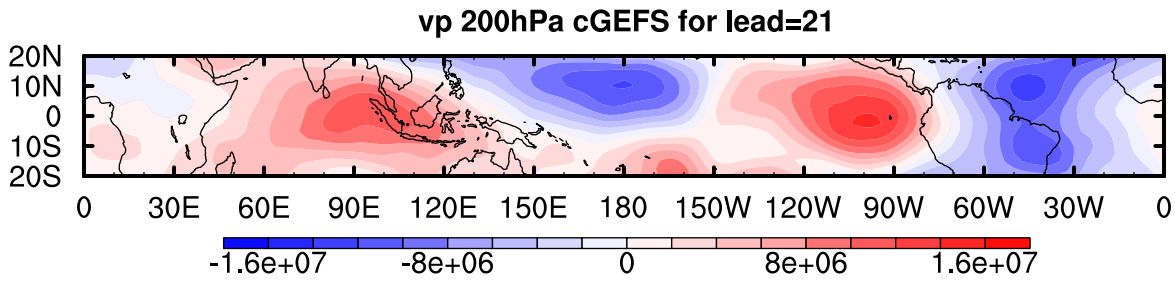
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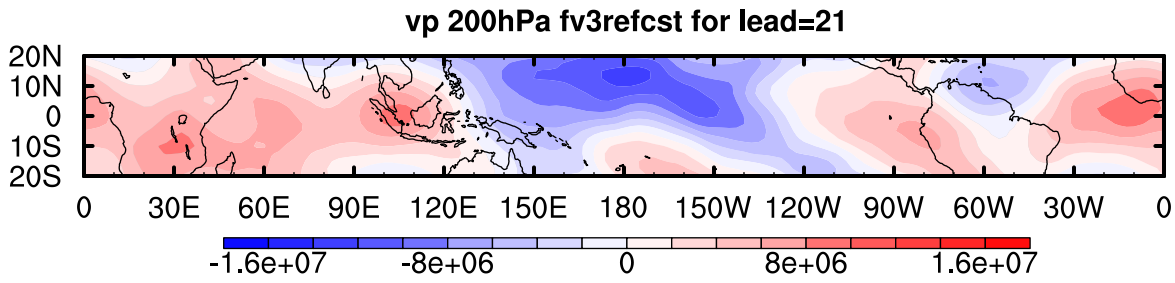
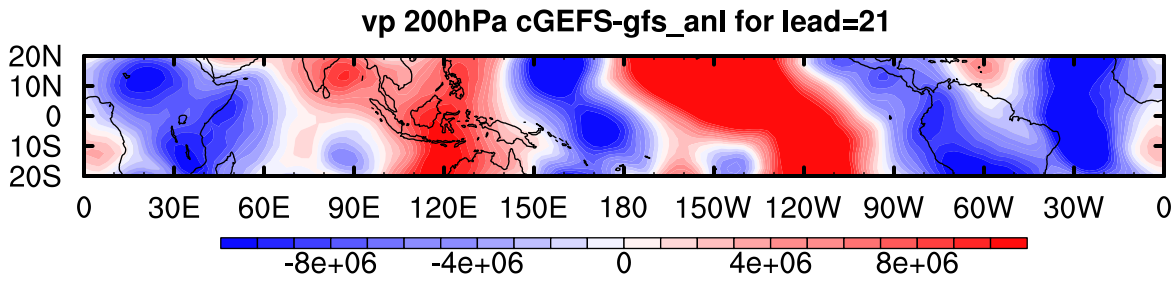
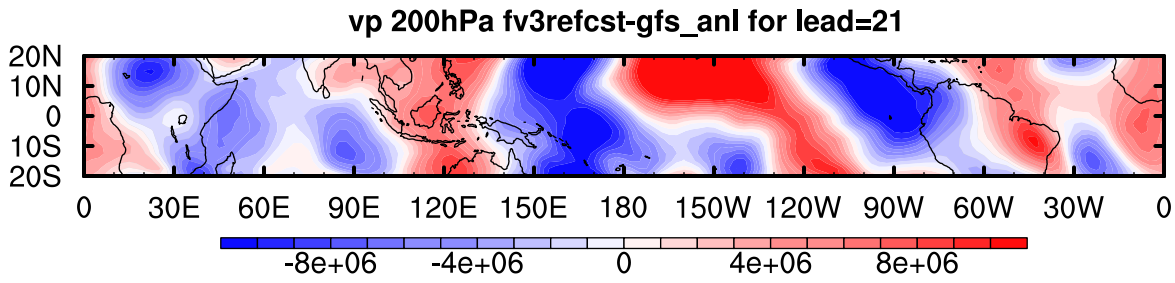
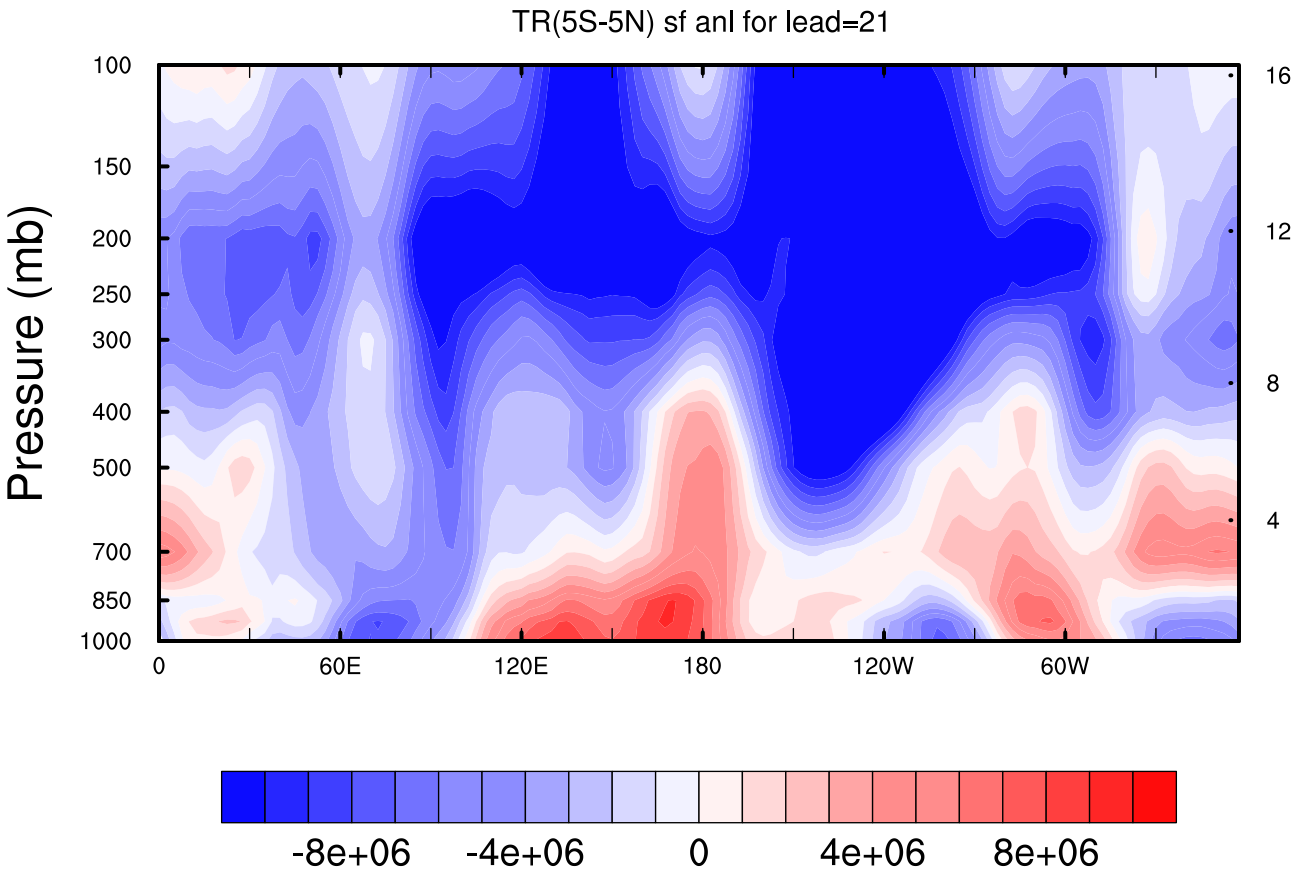
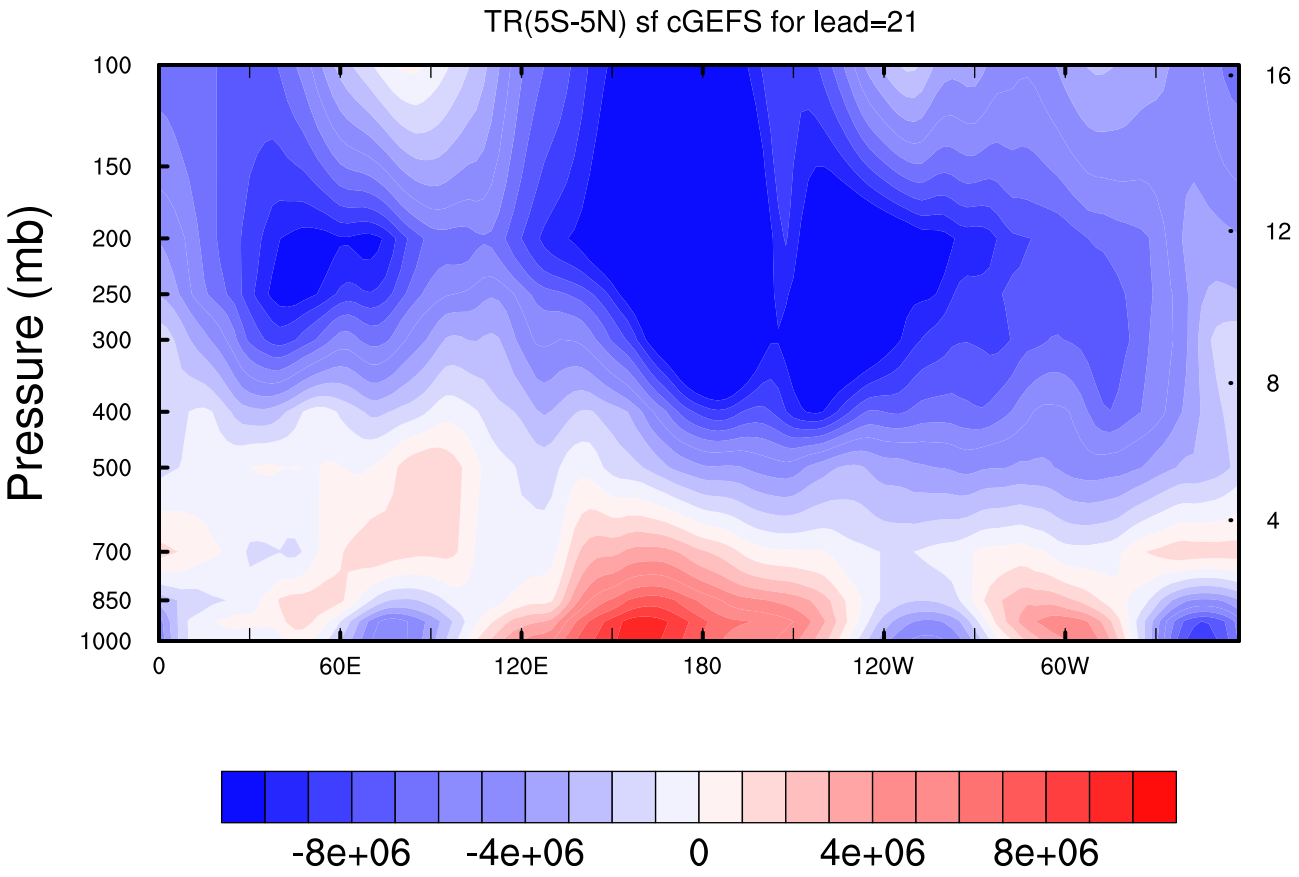
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

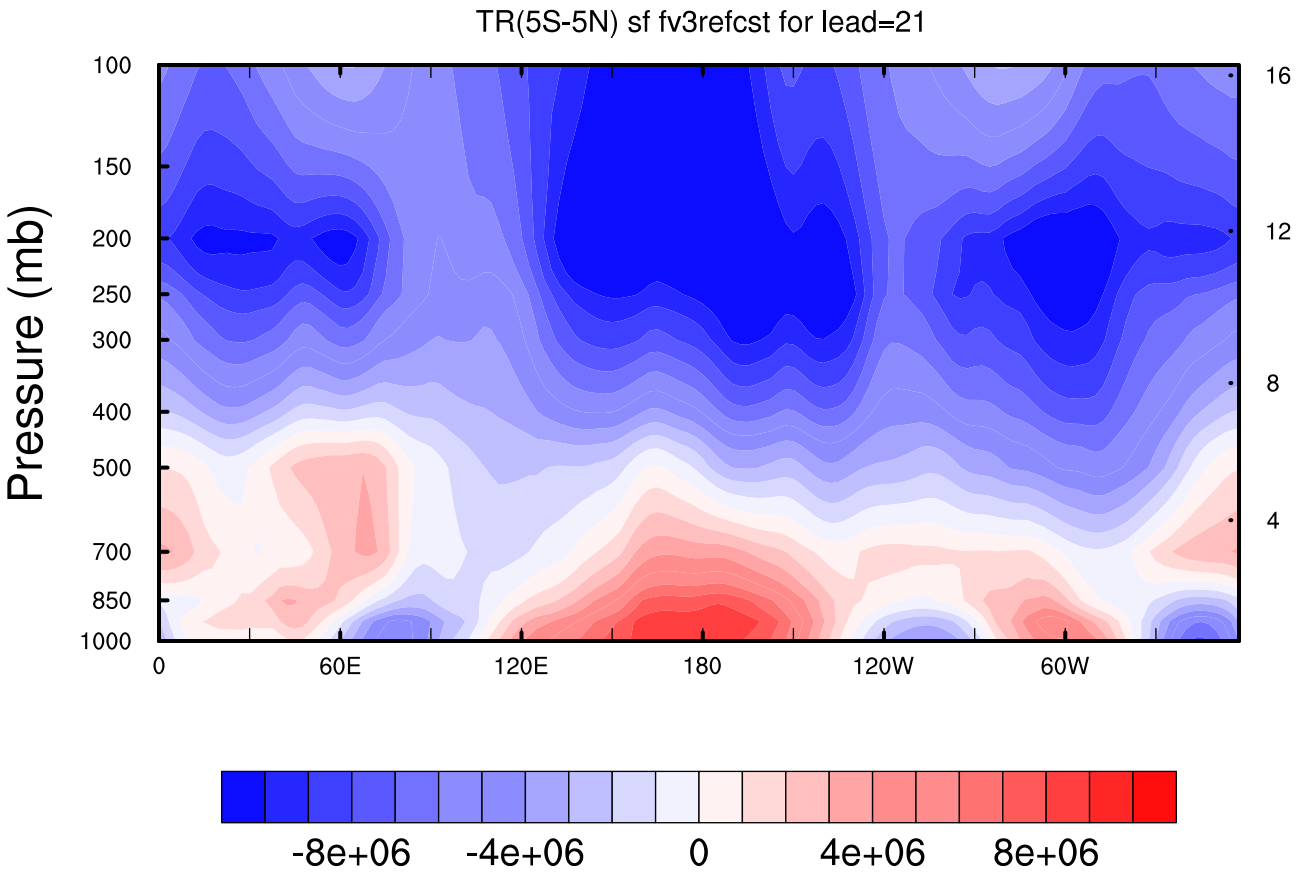

vp 200hPa fv3refcst for lead=21
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

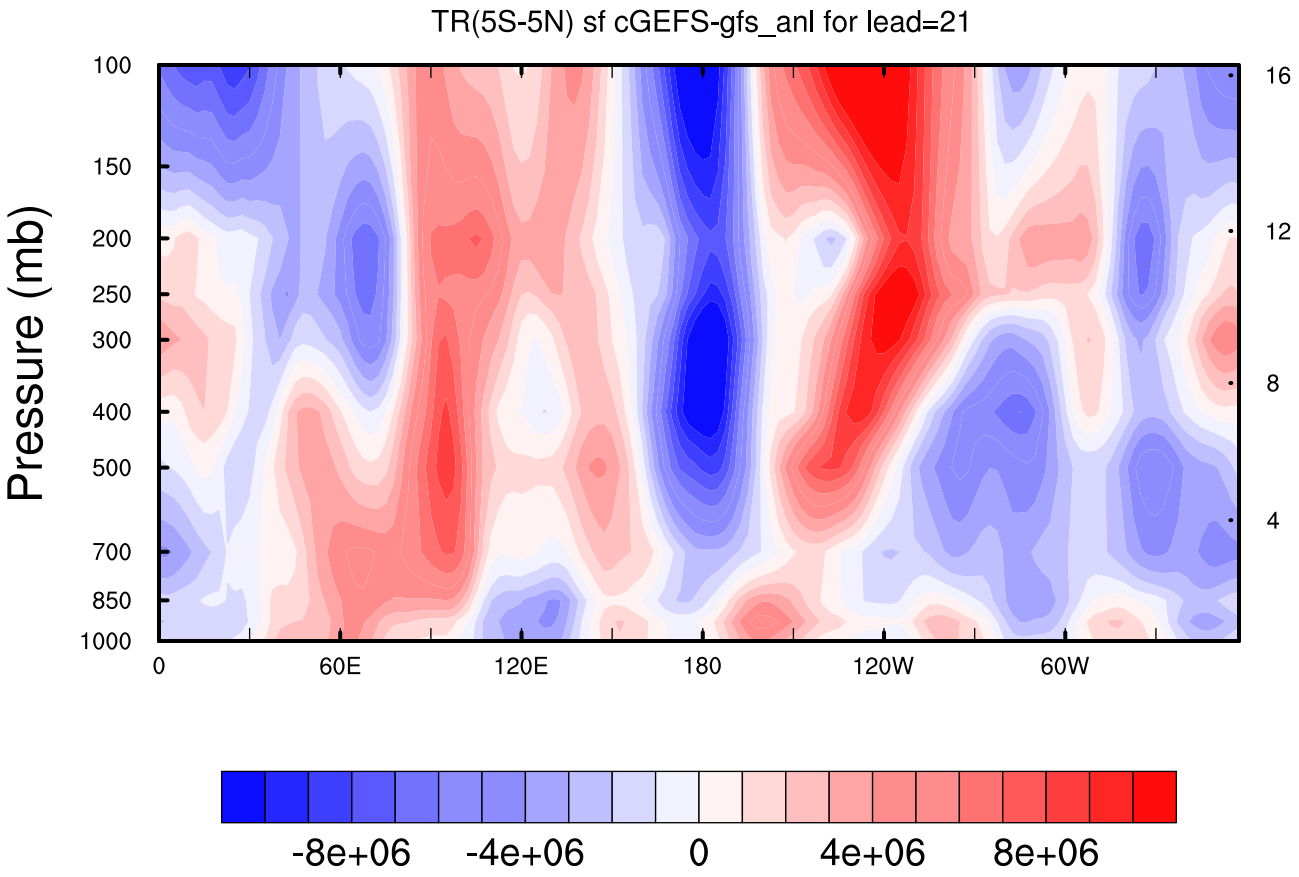

vp 200hPa cGEFS-gfs_anl for lead=21
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

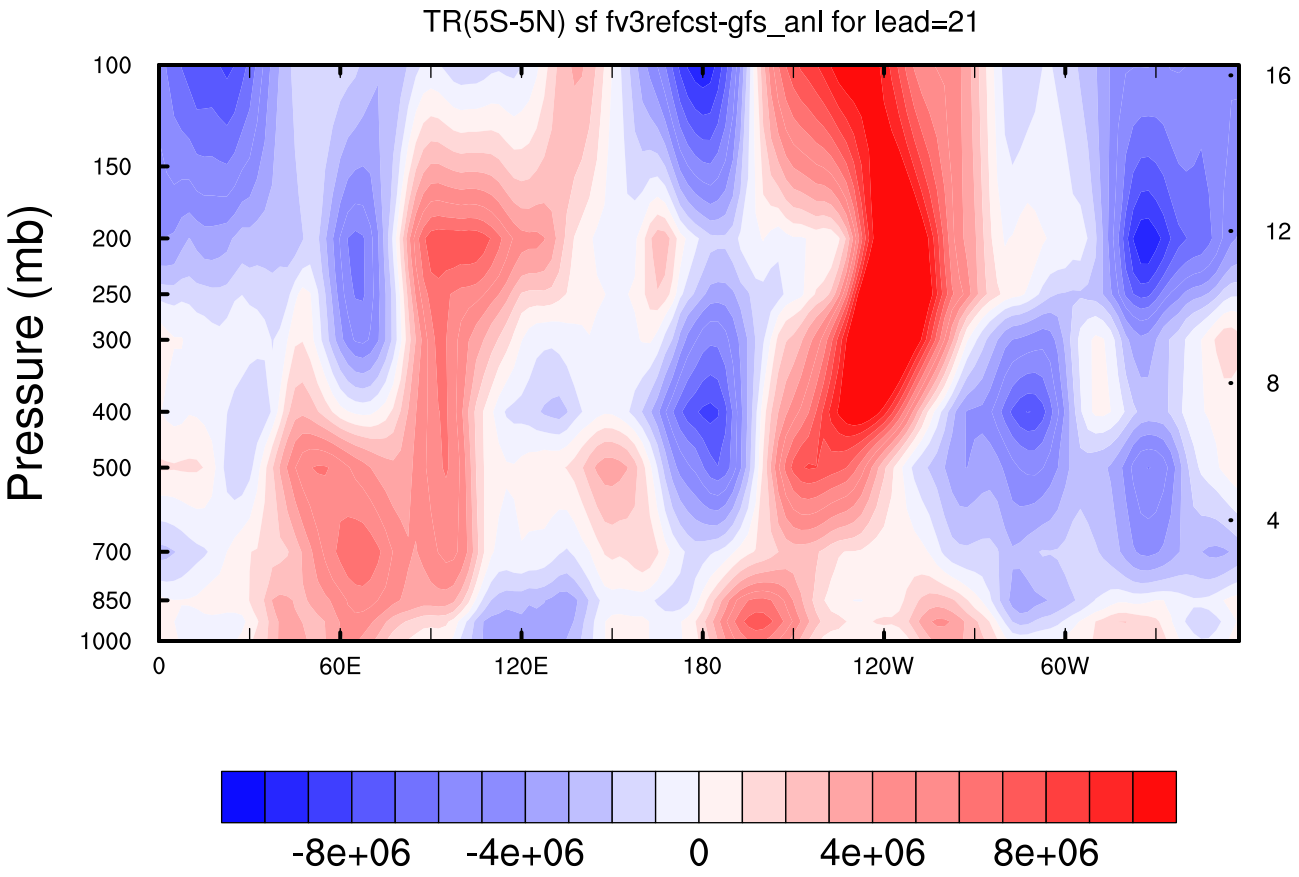

vp 200hPa fv3refcst-gfs_anl for lead=21
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

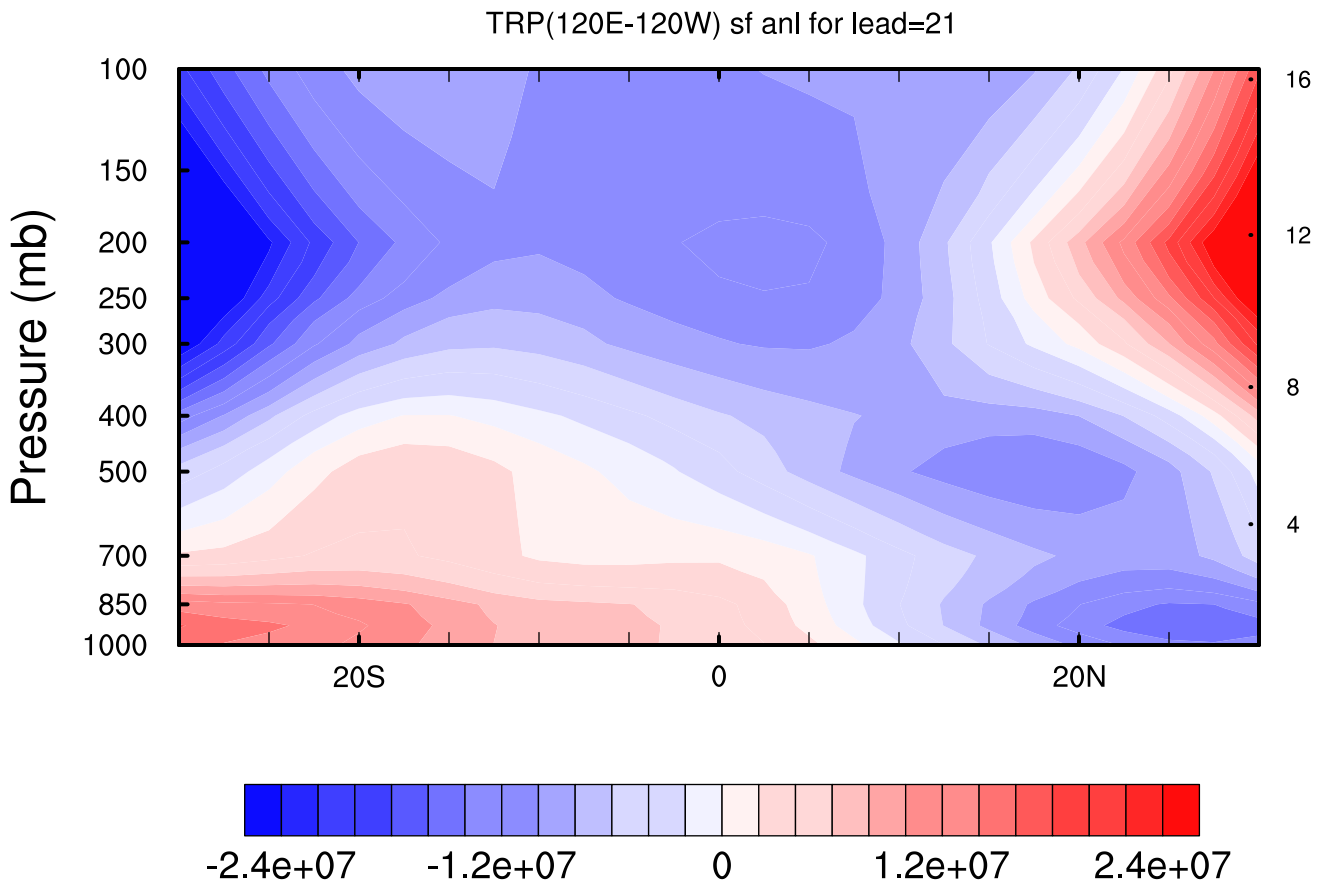

TR(5S-5N) sf anl for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

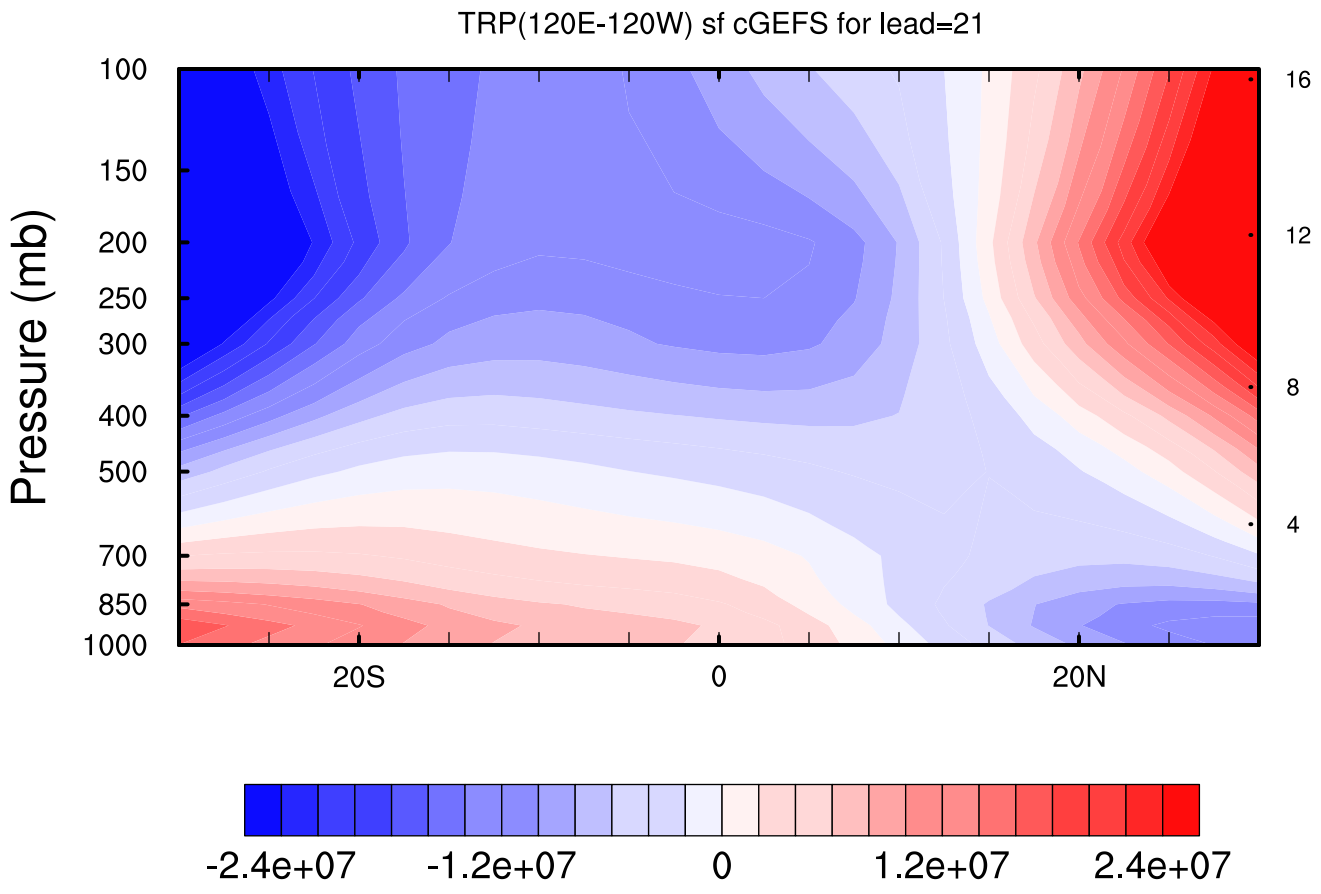

TR(5S-5N) sf cGEFS for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

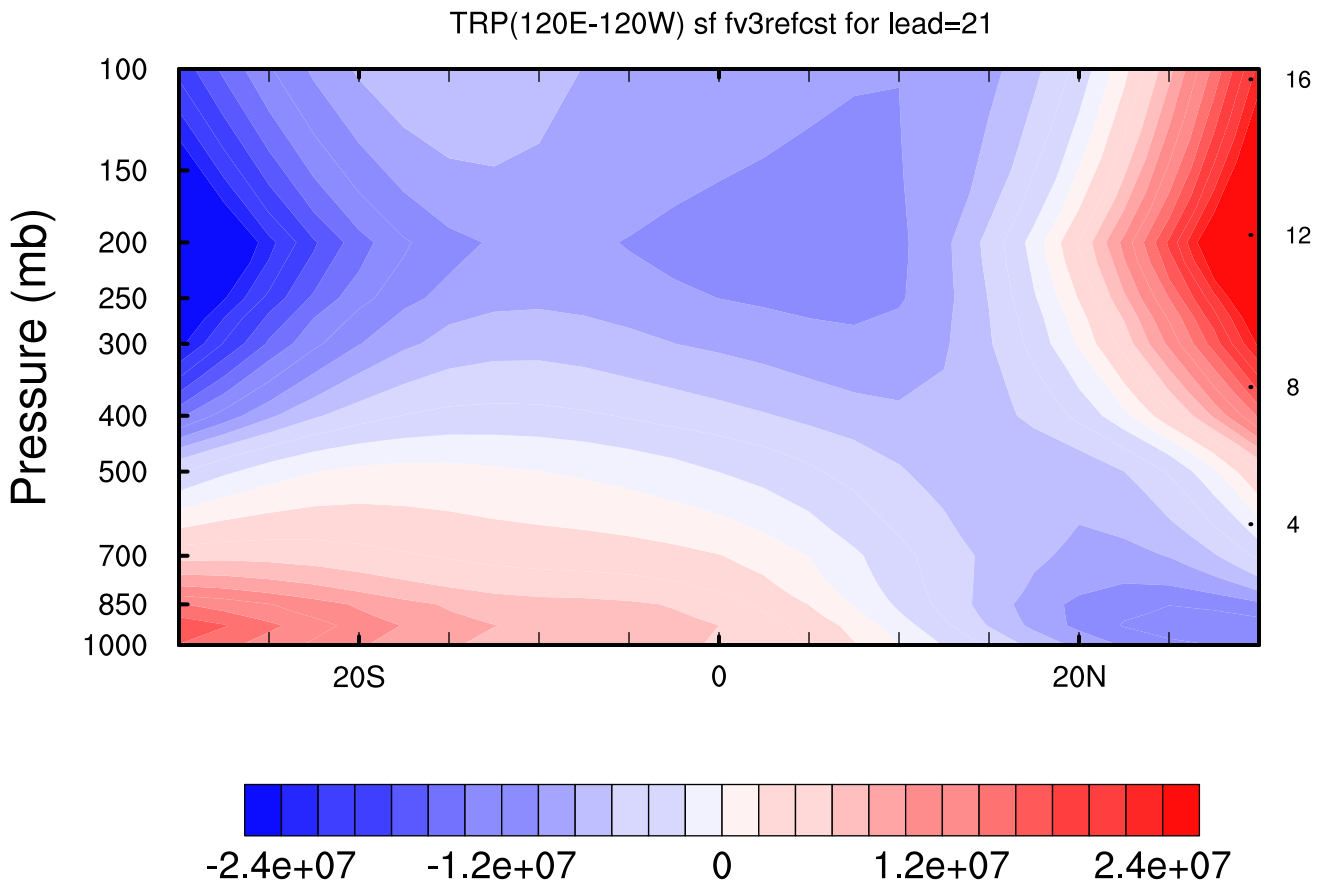

TR(5S-5N) sf fv3refcst for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

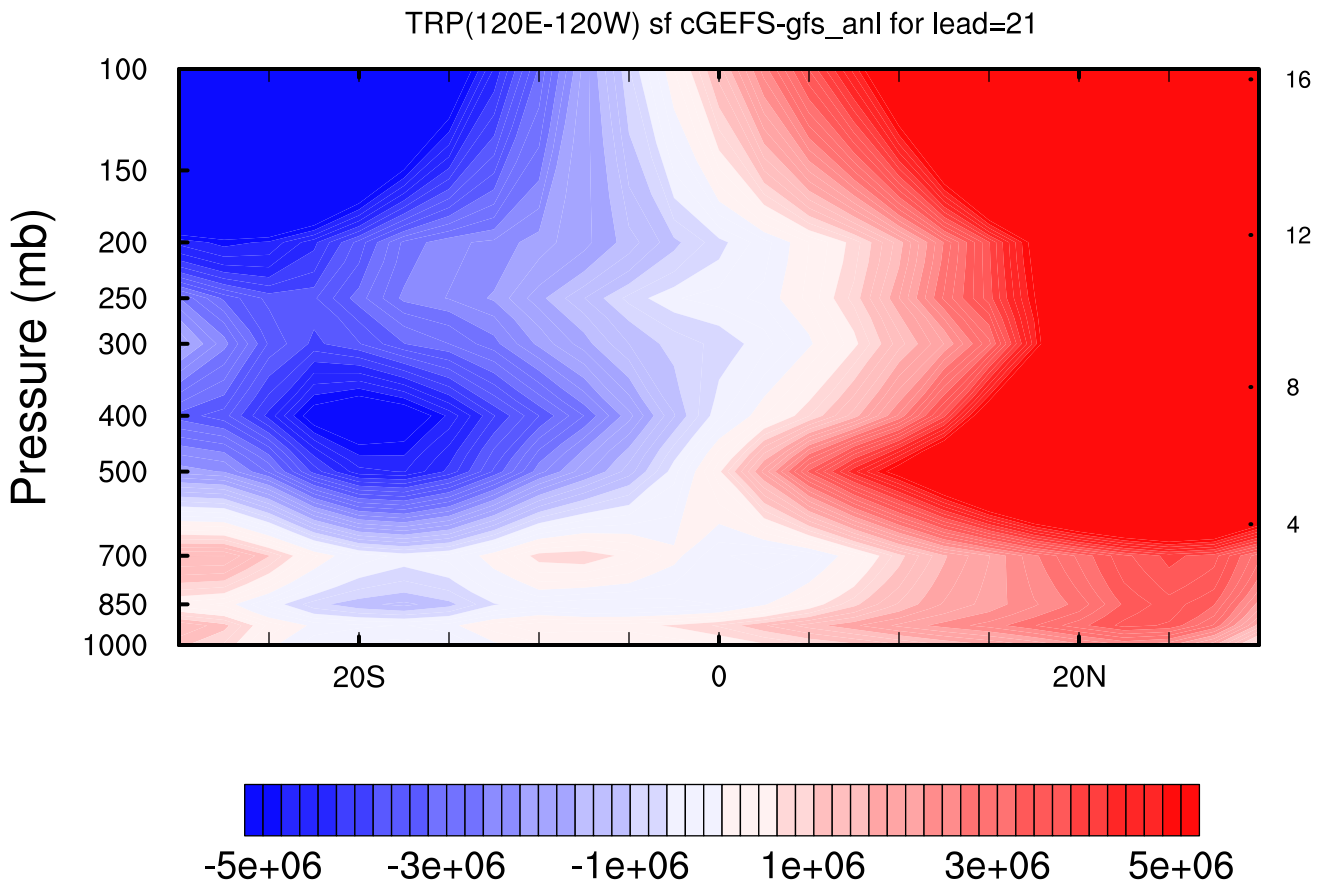

TR(5S-5N) sf cGEFS-gfs_anl for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

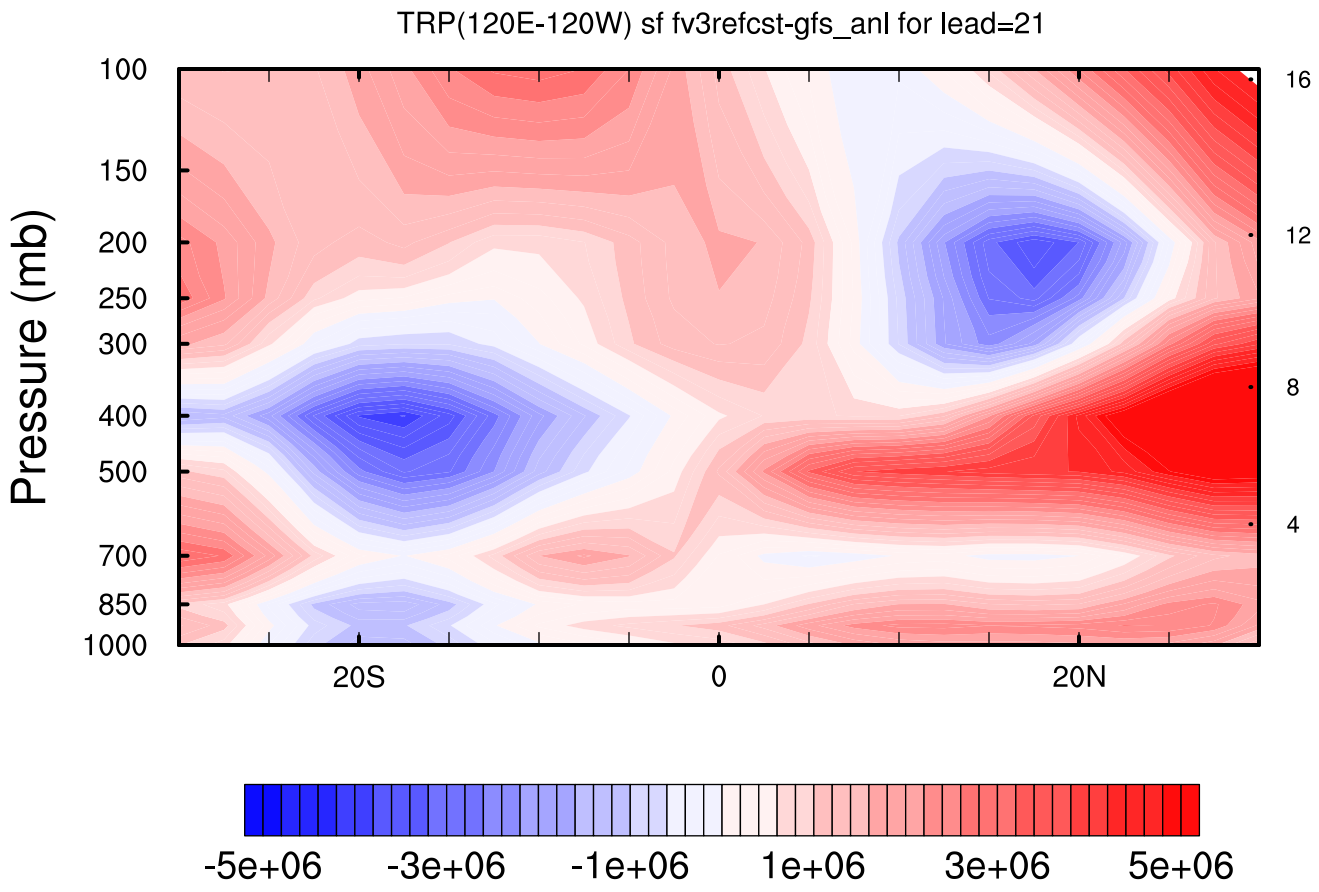

TR(5S-5N) sf fv3refcst-gfs_anl for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

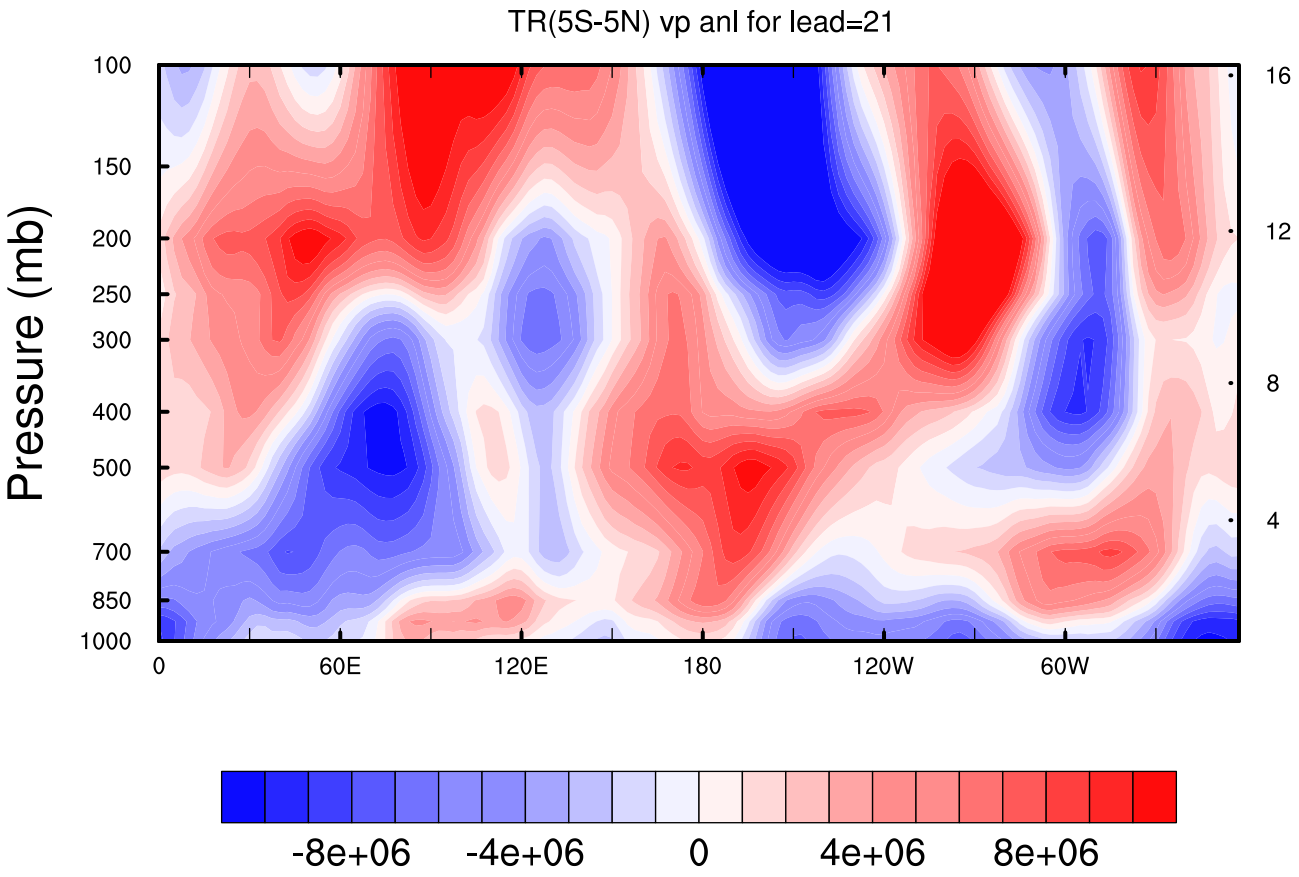

TRP(120E-120W) sf anl for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

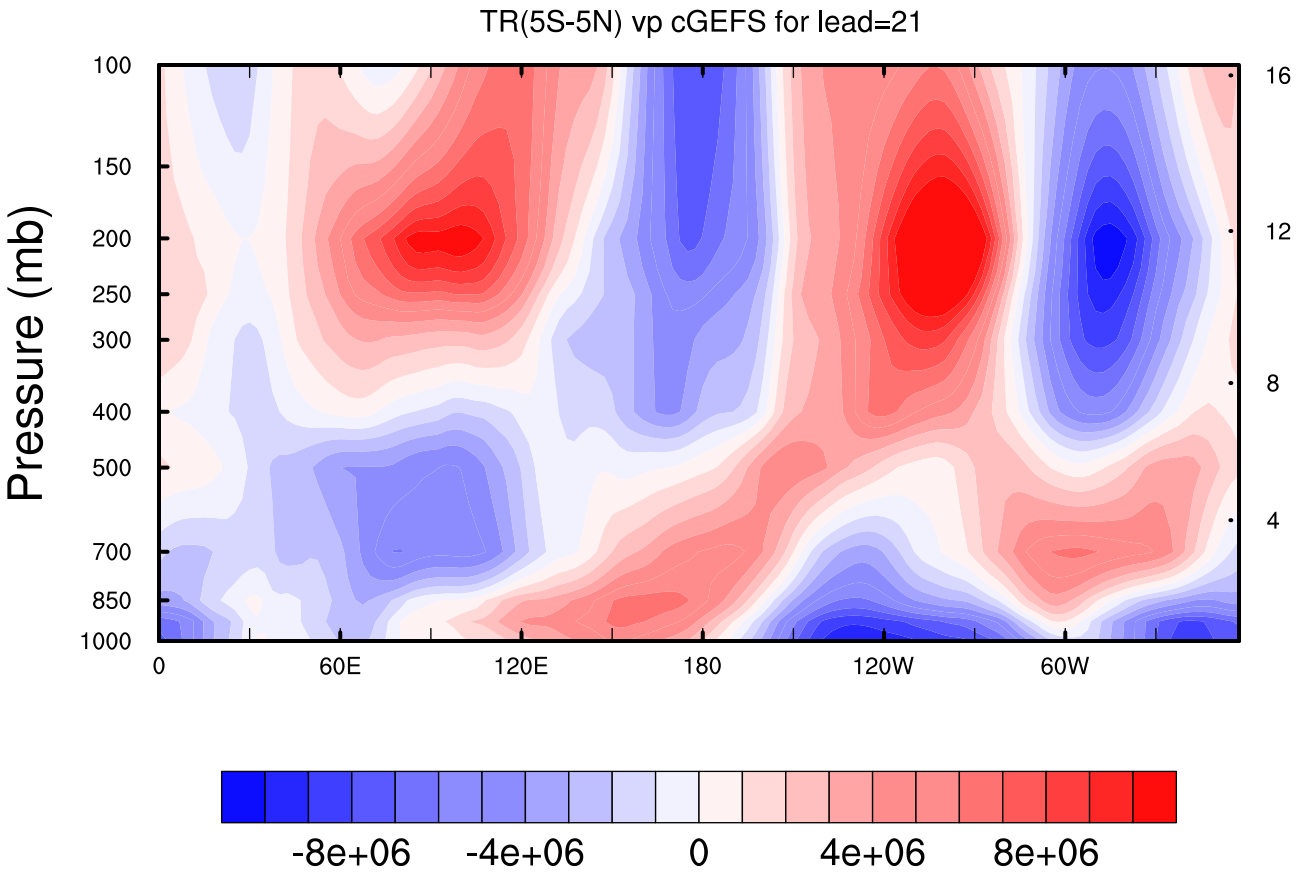

TRP(120E-120W) sf cGEFS for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

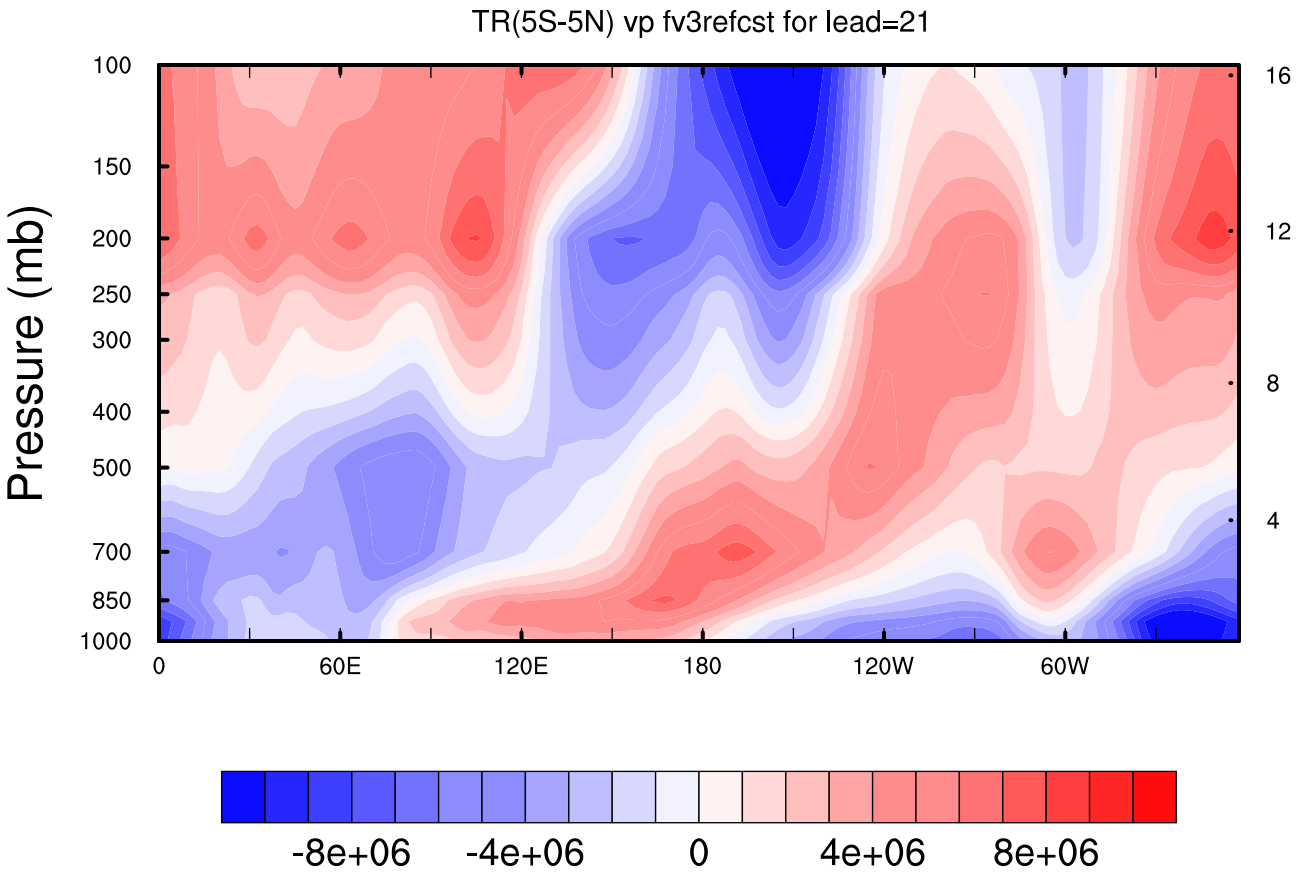

TRP(120E-120W) sf fv3refcst for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

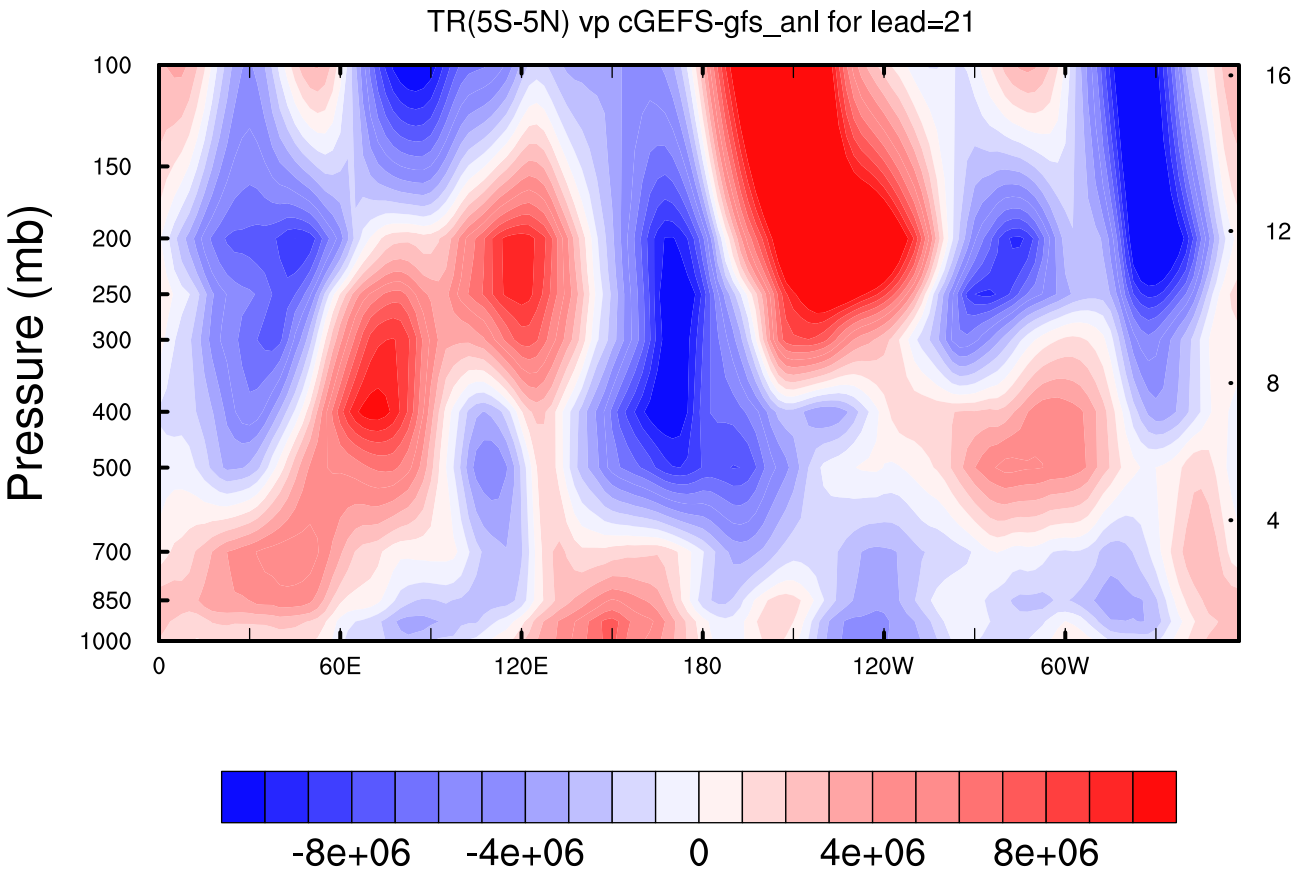

TRP(120E-120W) sf cGEFS-gfs_anl for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

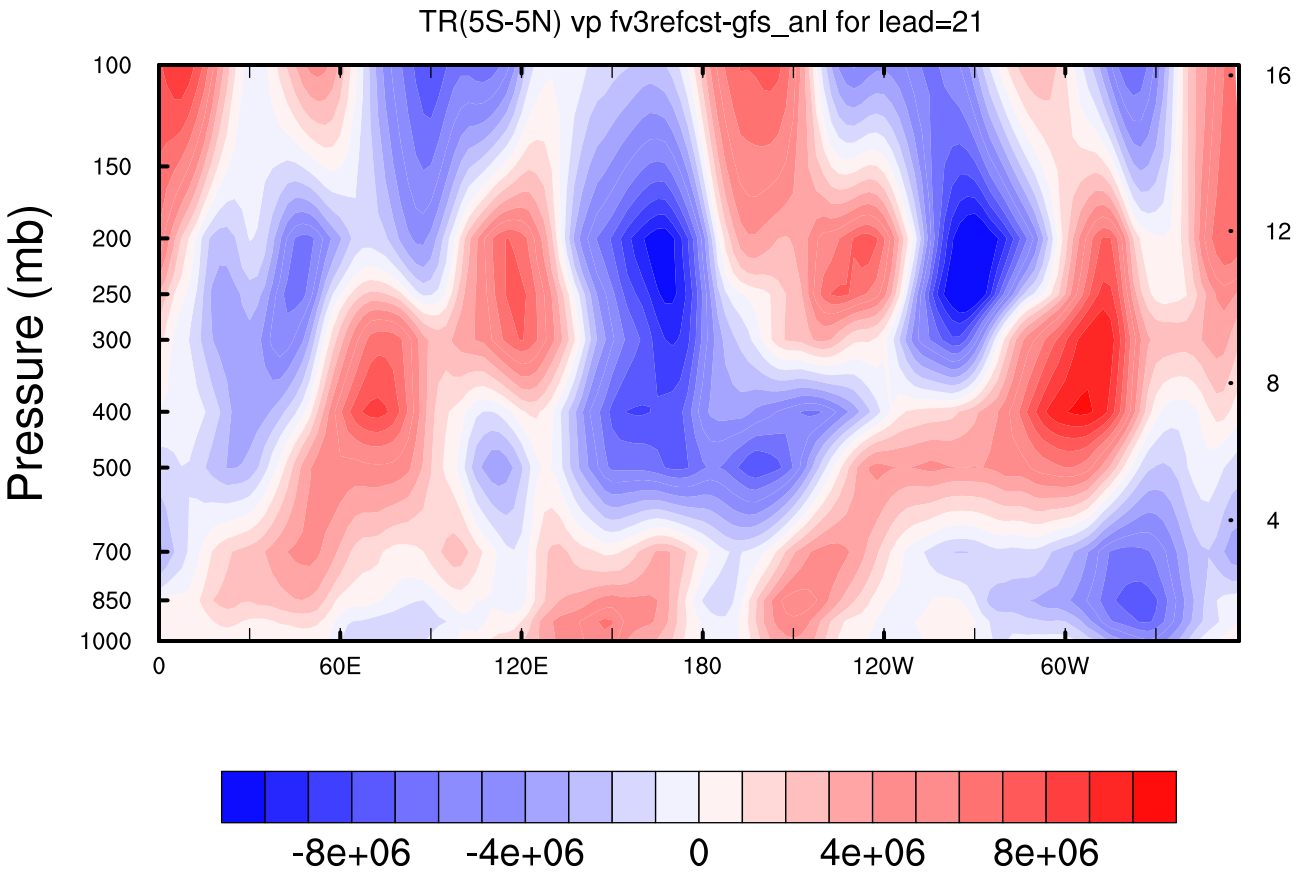

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

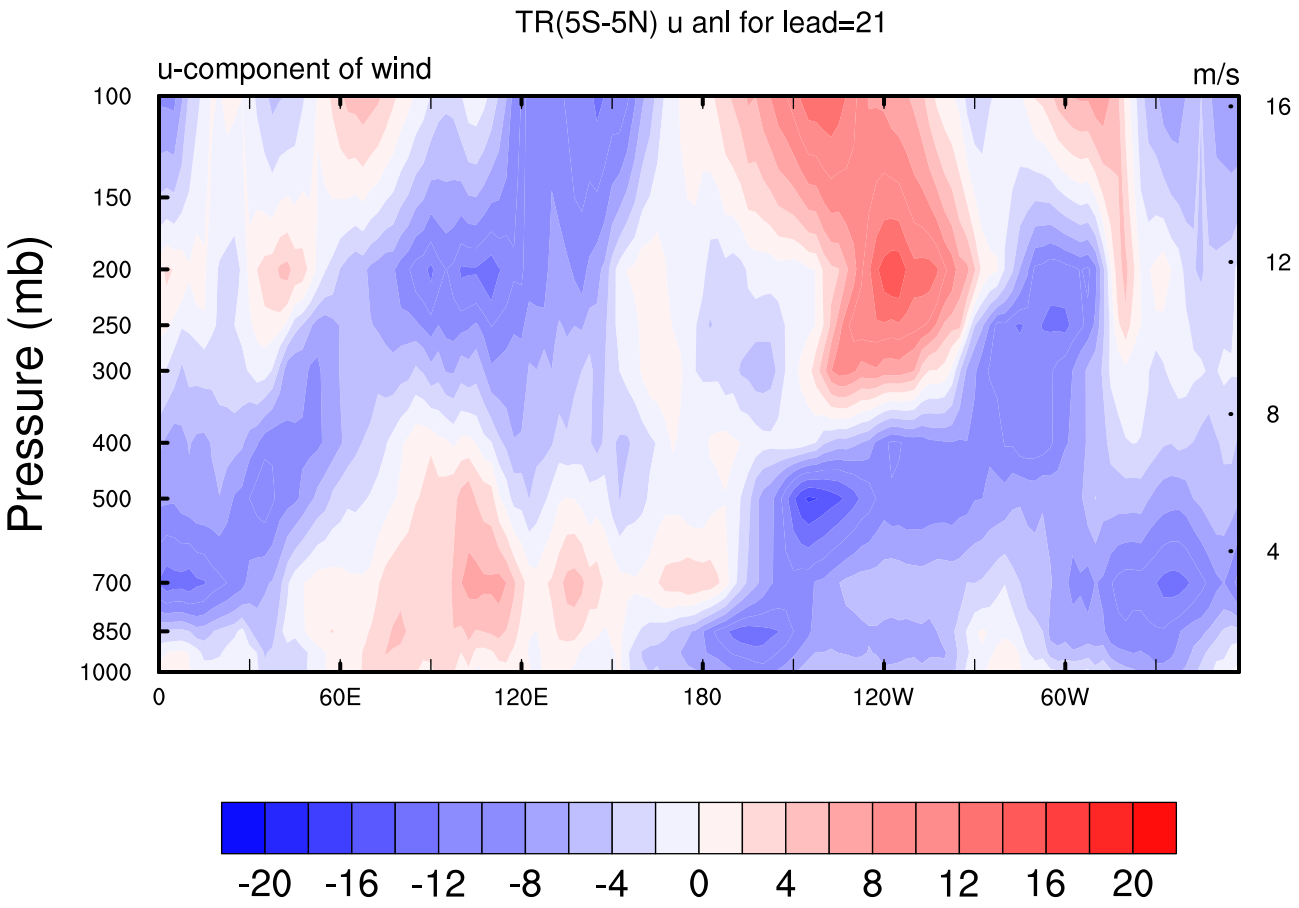

TR(5S-5N) vp anl for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

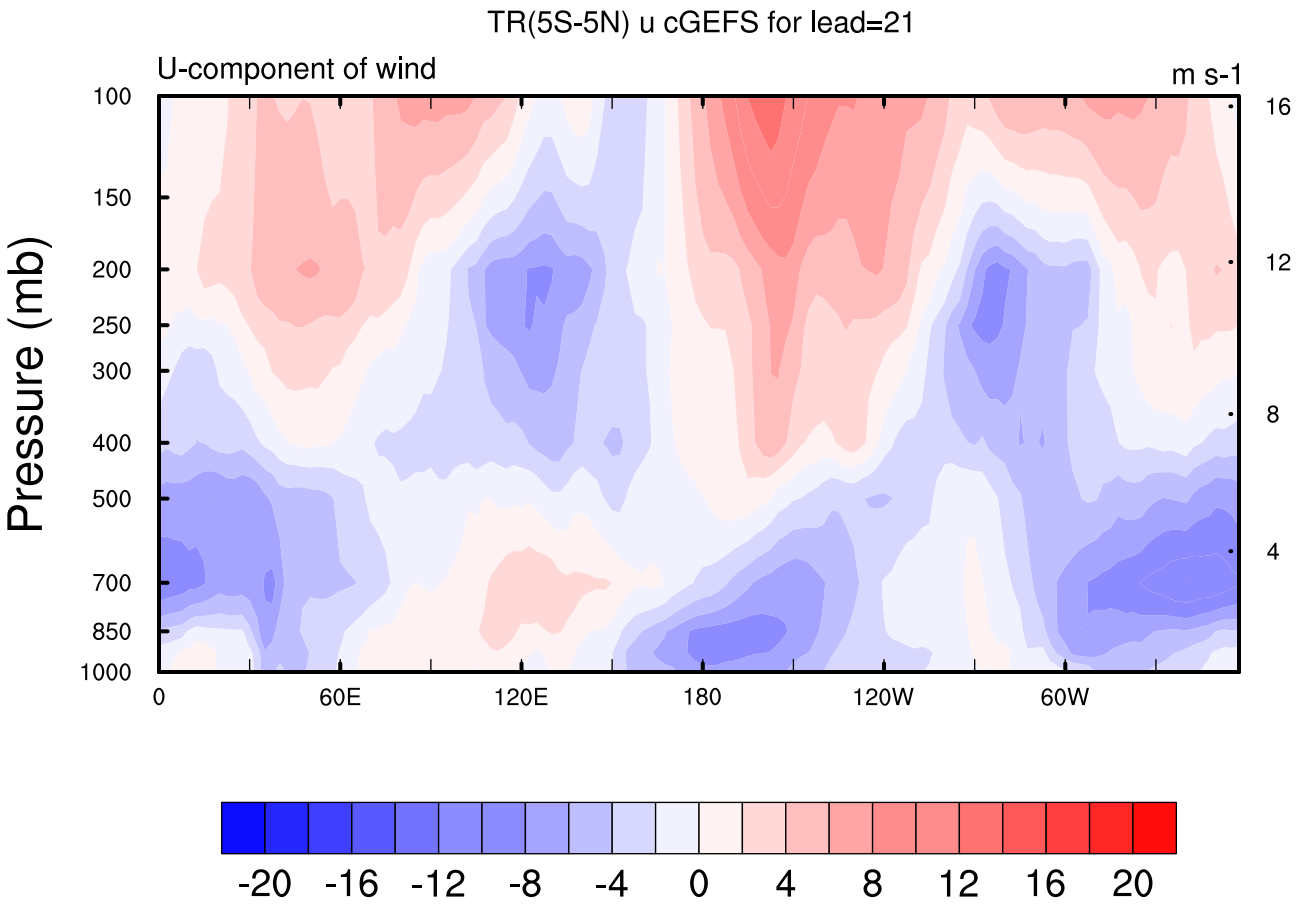

TR(5S-5N) vp cGEFS for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

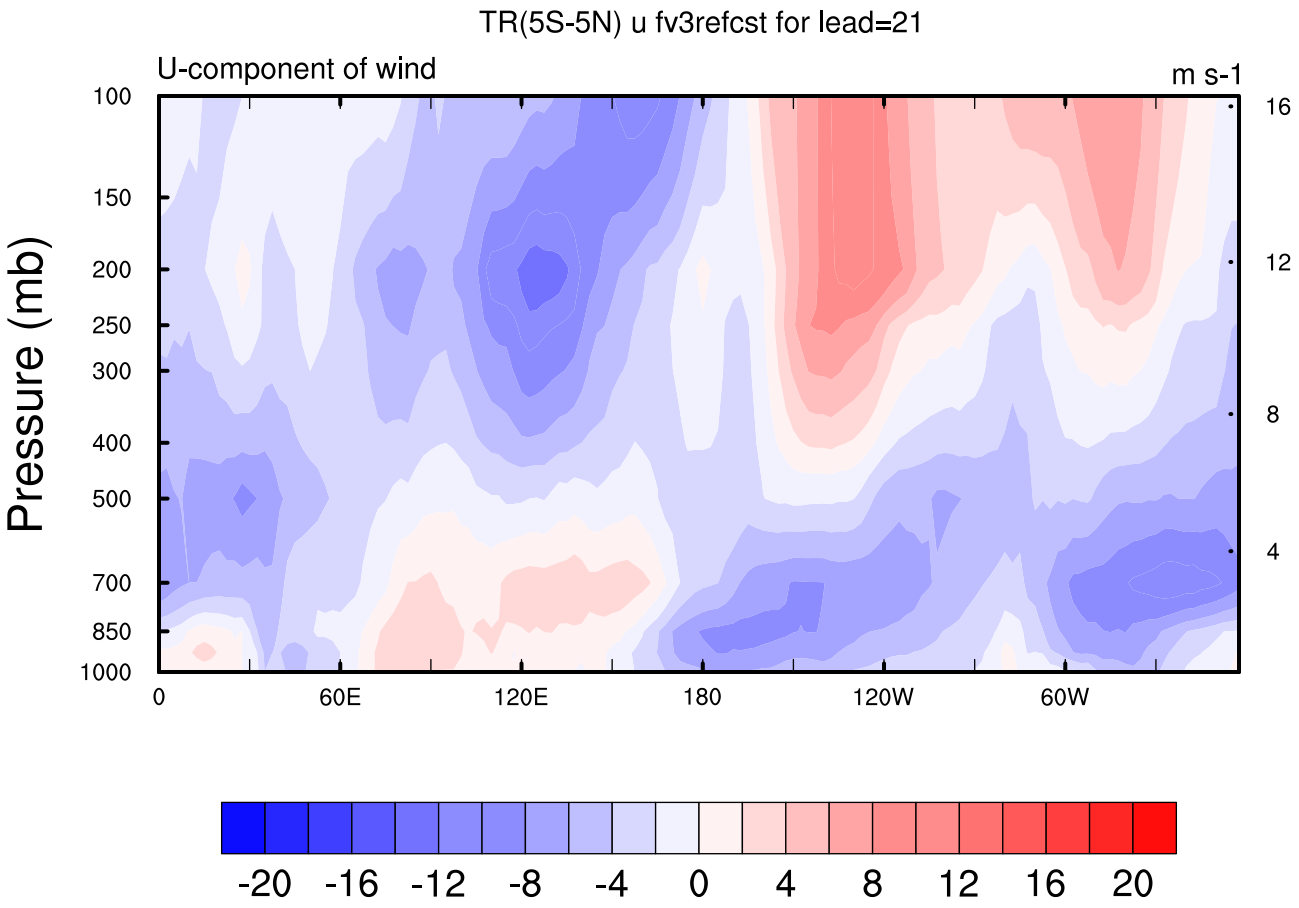

TR(5S-5N) vp fv3refcst for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

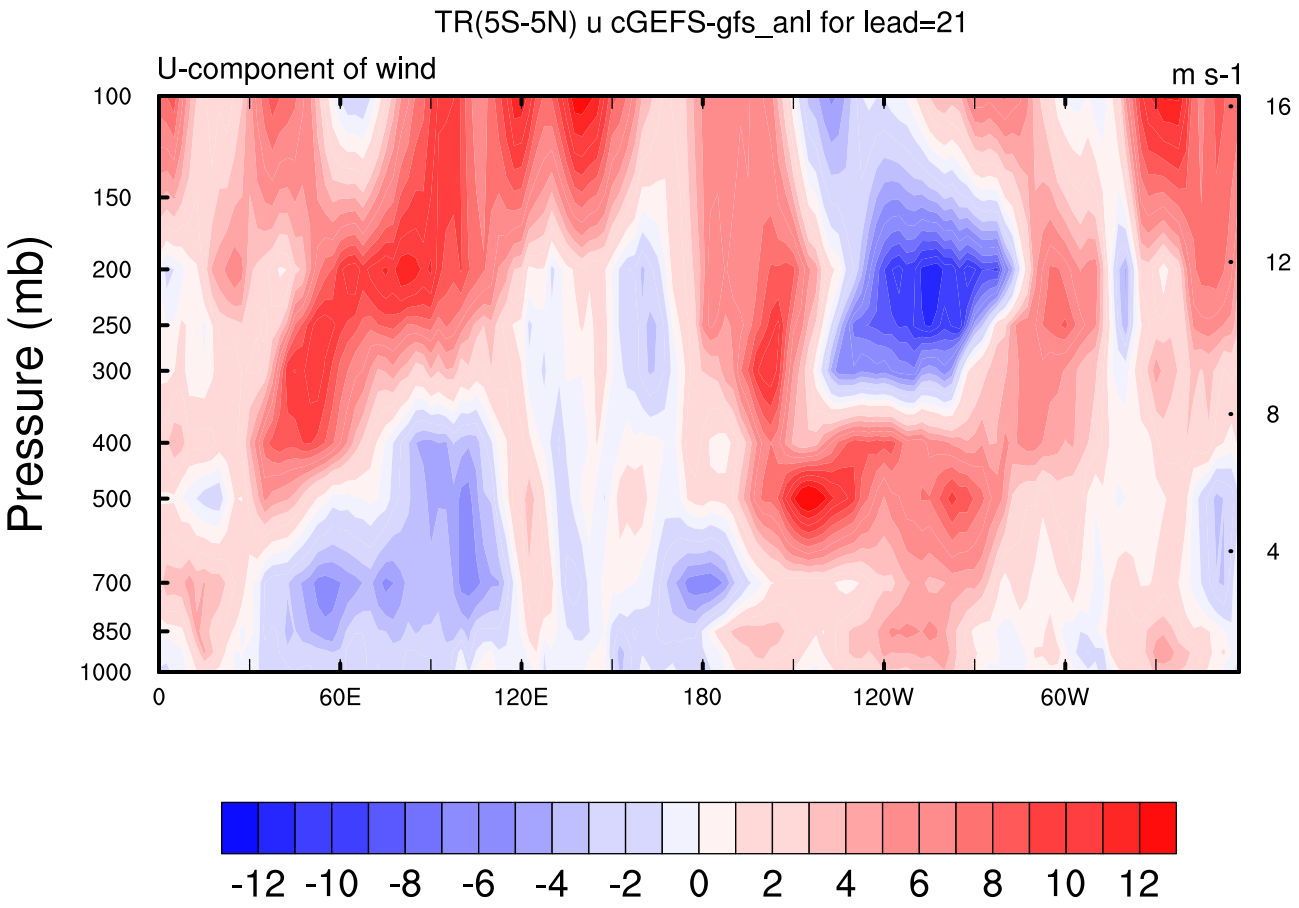

TR(5S-5N) vp cGEFS-gfs_anl for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

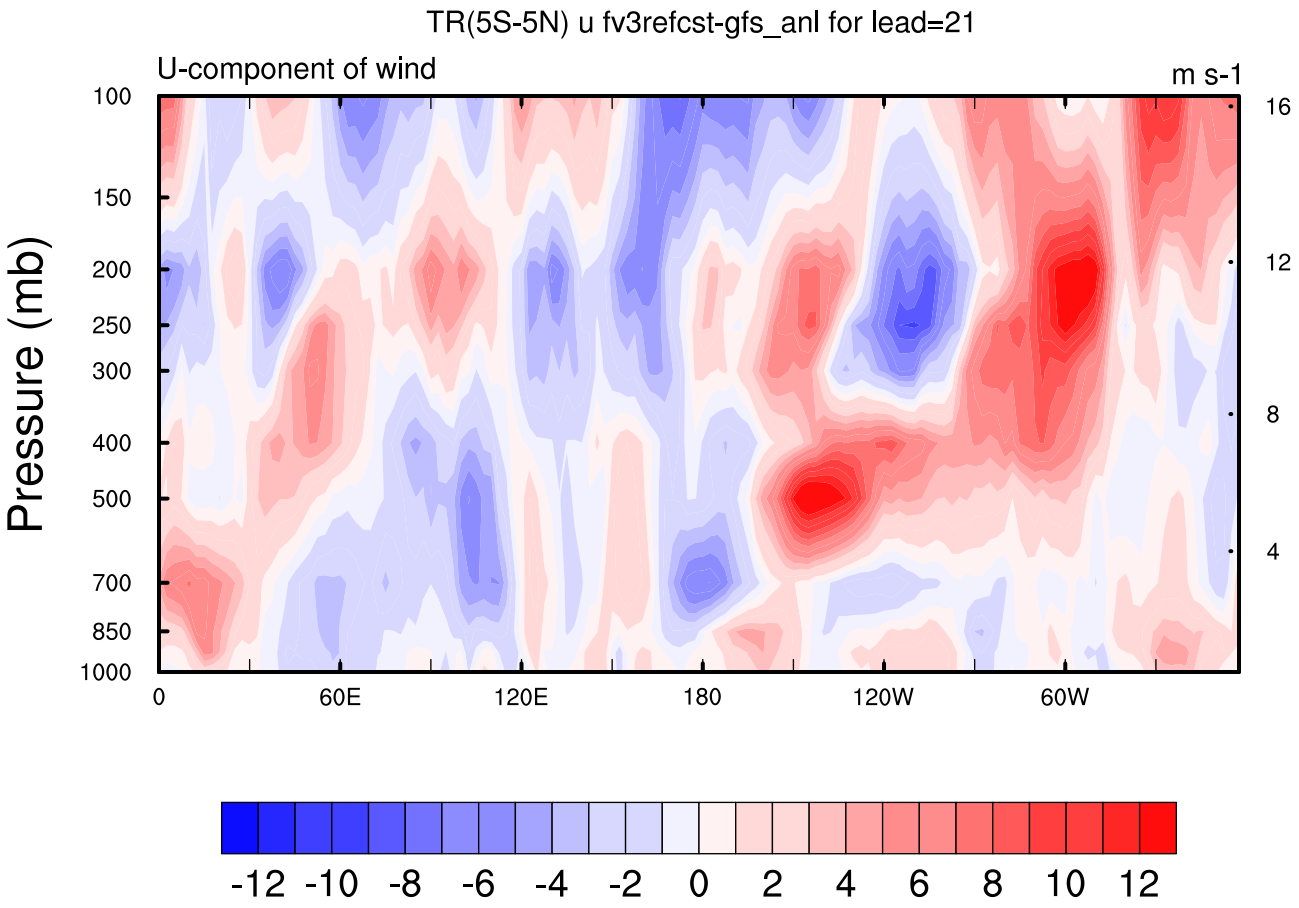

TR(5S-5N) vp fv3refcst-gfs_anl for lead=21
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

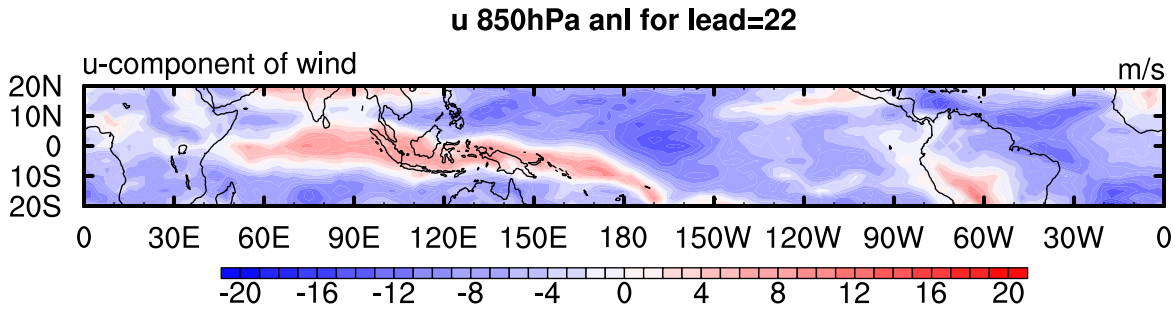

TR(5S-5N) u anl for lead=21
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

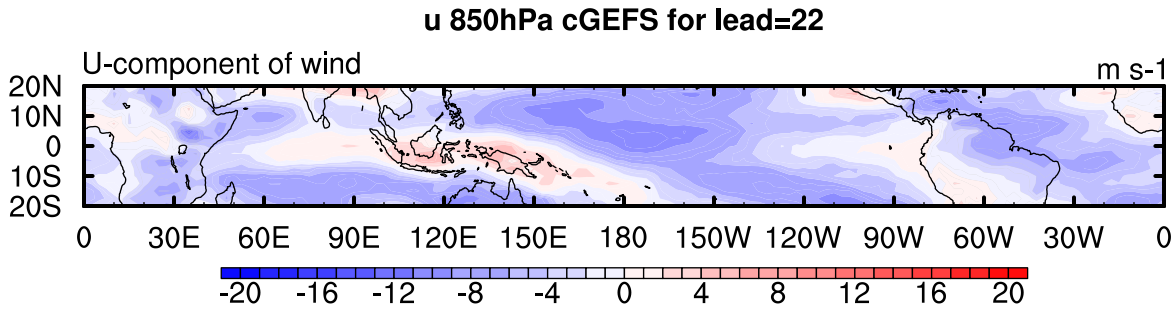

TR(5S-5N) u cGEFS for lead=21
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

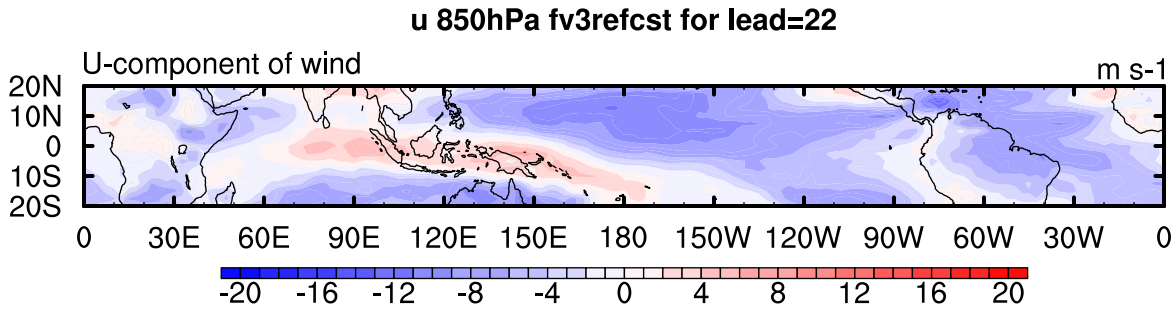

TR(5S-5N) u fv3refcst for lead=21
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

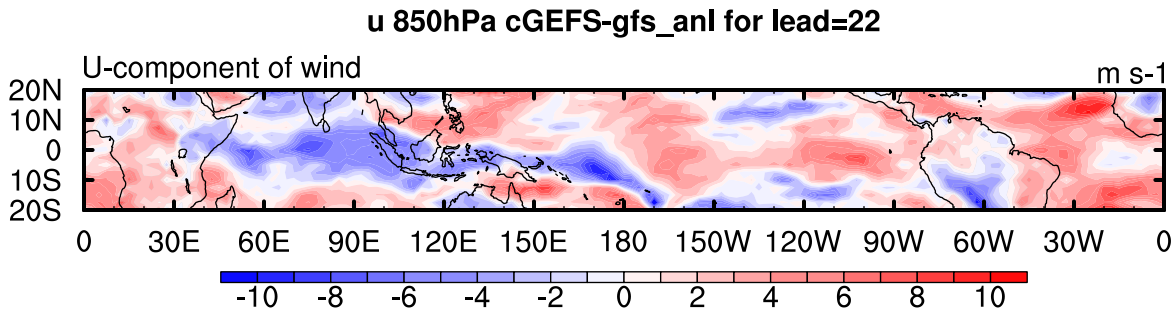

TR(5S-5N) u cGEFS-gfs_anl for lead=21
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

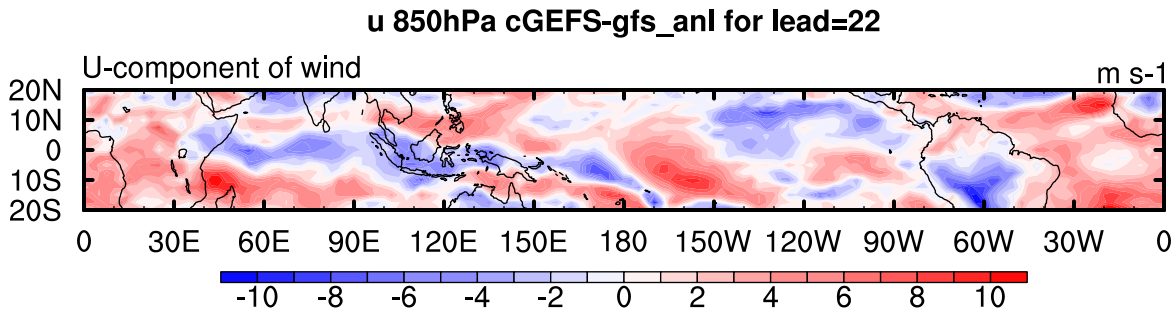

TR(5S-5N) u fv3refcst-gfs_anl for lead=21
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

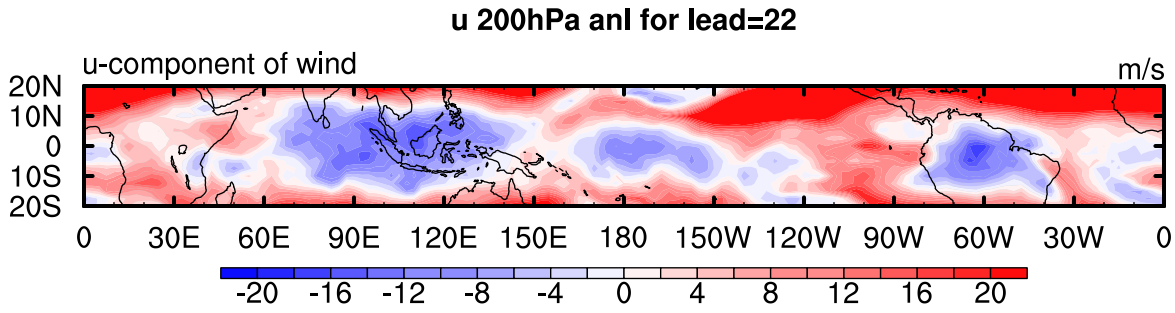

u 850hPa anl for lead=22
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

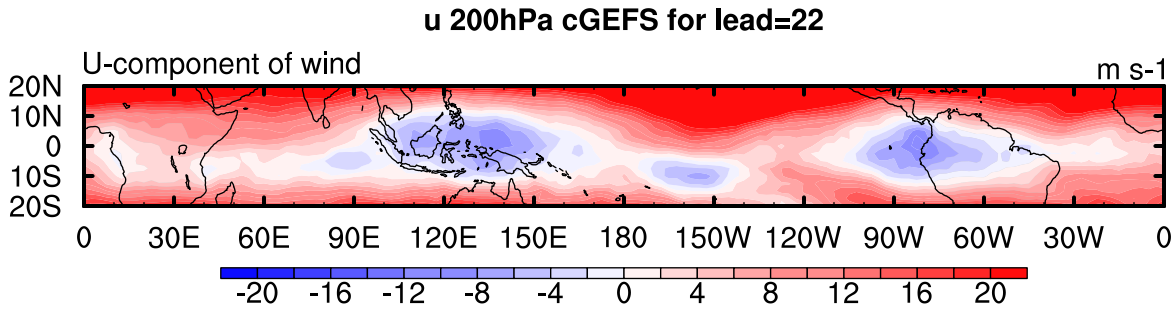

u 850hPa cGEFS for lead=22
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

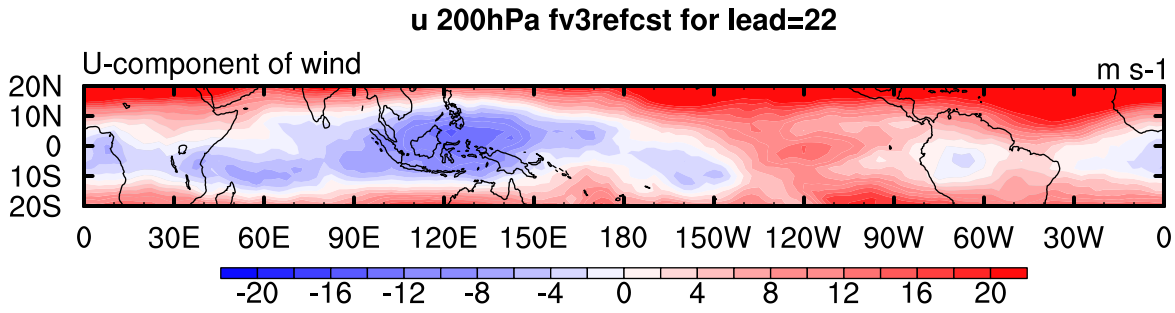

u 850hPa fv3refcst for lead=22
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

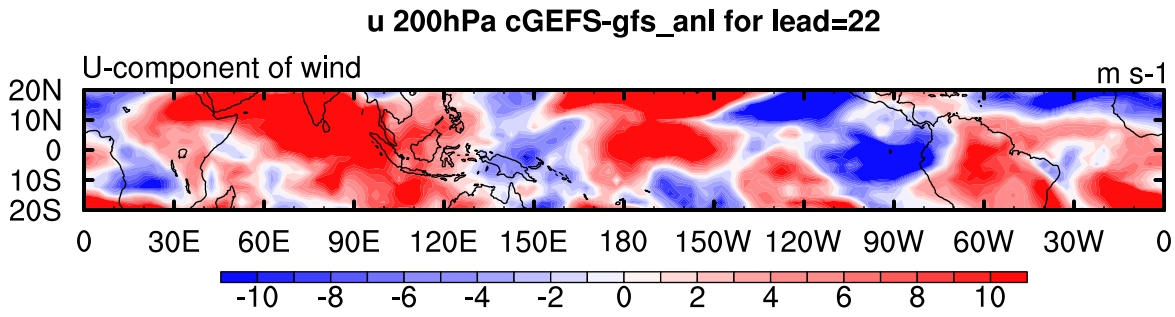

u 850hPa cGEFS-gfs_anl for lead=22
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

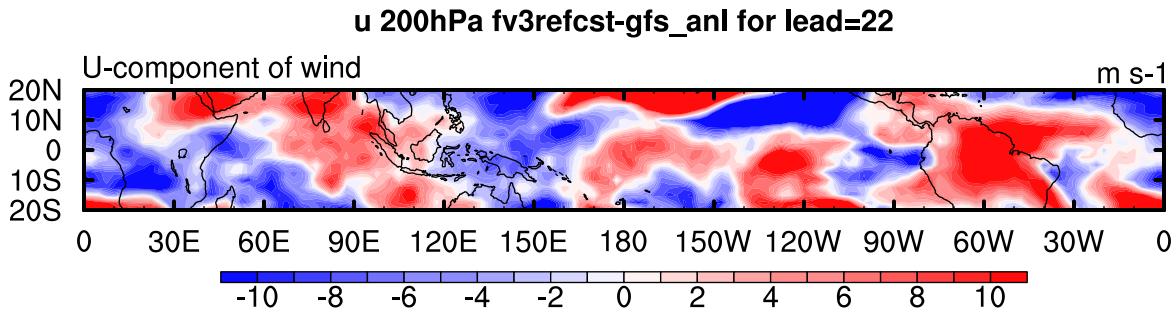

u 850hPa cGEFS-gfs_anl for lead=22
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

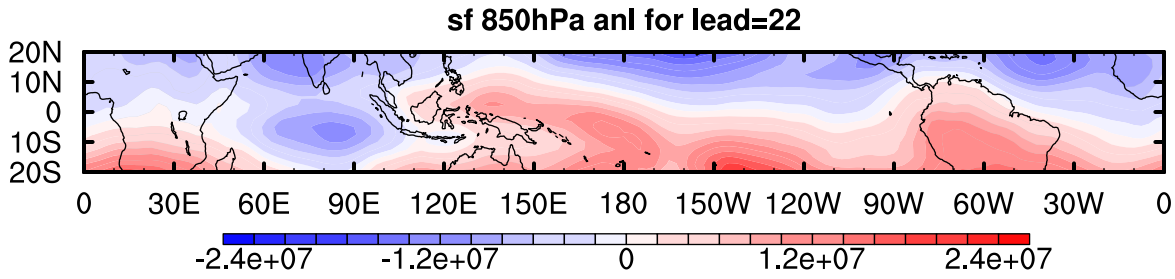

u 200hPa anl for lead=22
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

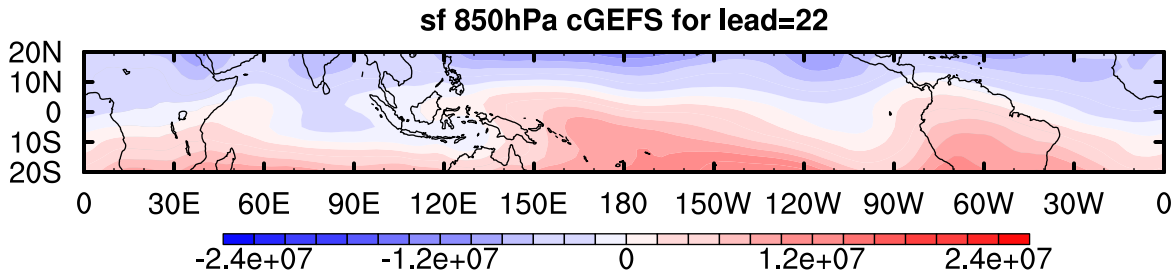

u 200hPa cGEFS for lead=22
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

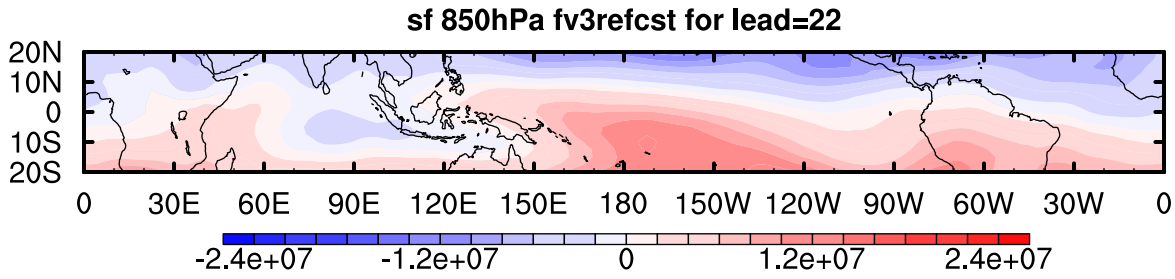

u 200hPa fv3refcst for lead=22
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

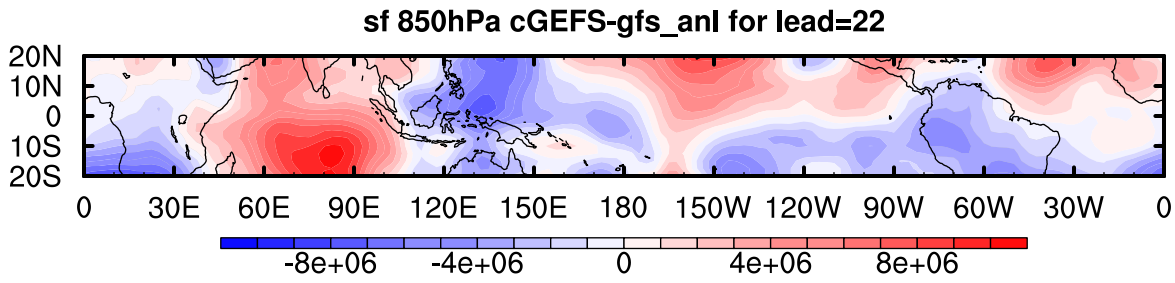

u 200hPa cGEFS-gfs_anl for lead=22
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

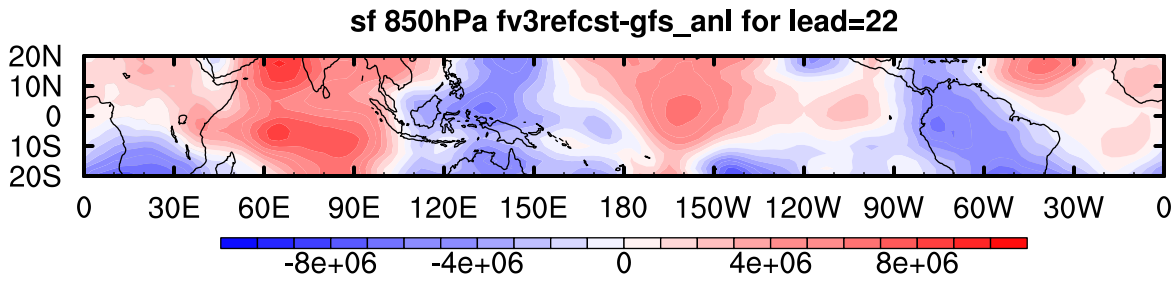

u 200hPa fv3refcst-gfs_anl for lead=22
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

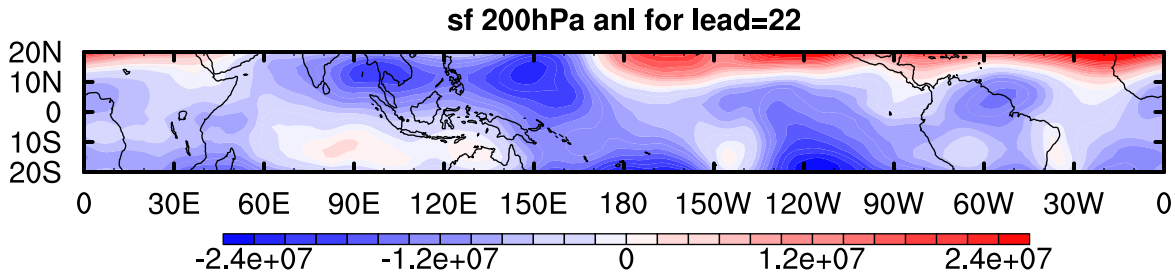

sf 850hPa anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

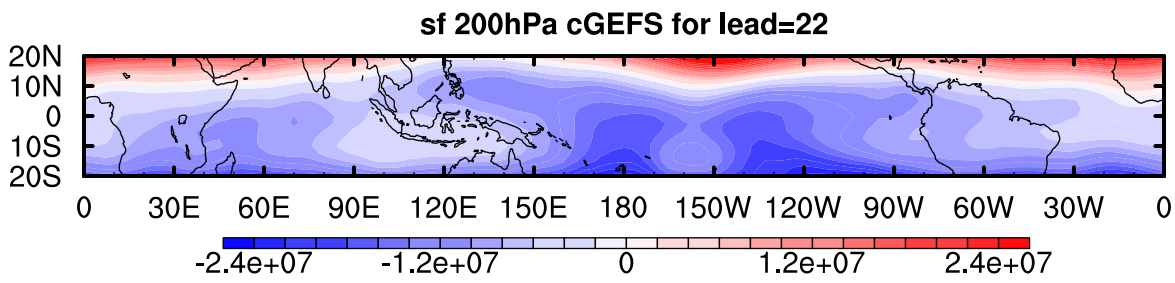

sf 850hPa cGEFS for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

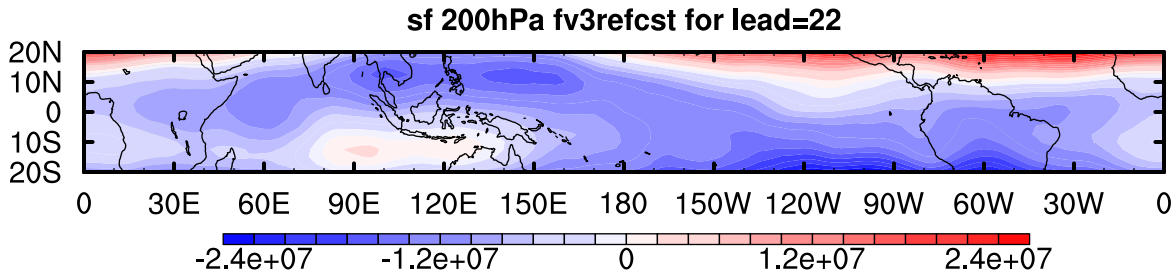

sf 850hPa fv3refcst for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

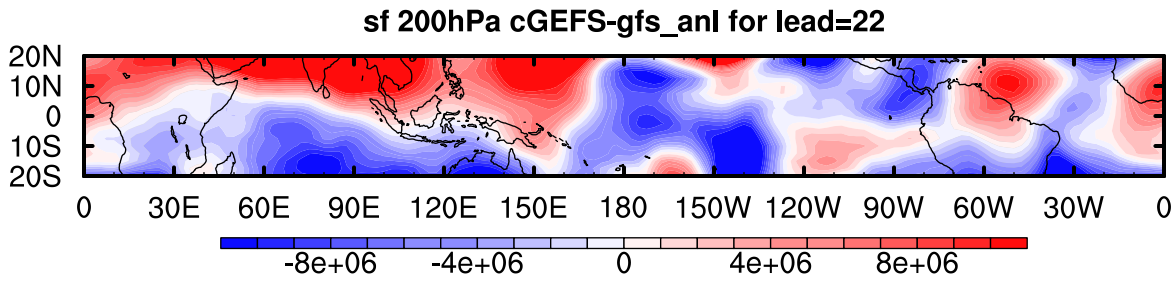

sf 850hPa cGEFS-gfs_anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

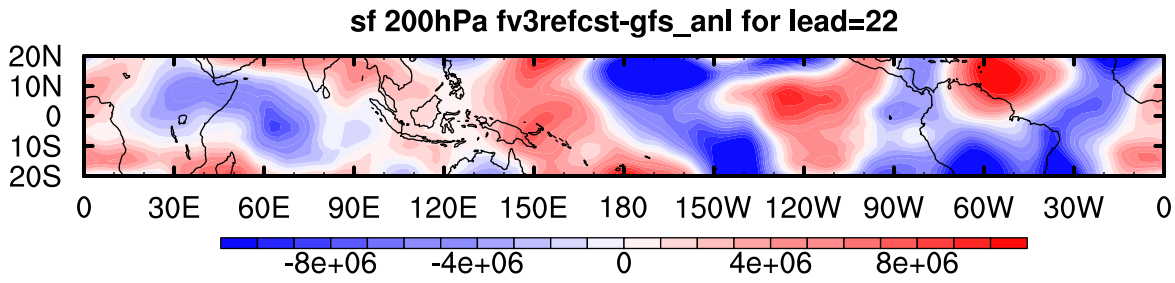

sf 850hPa fv3refcst-gfs_anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

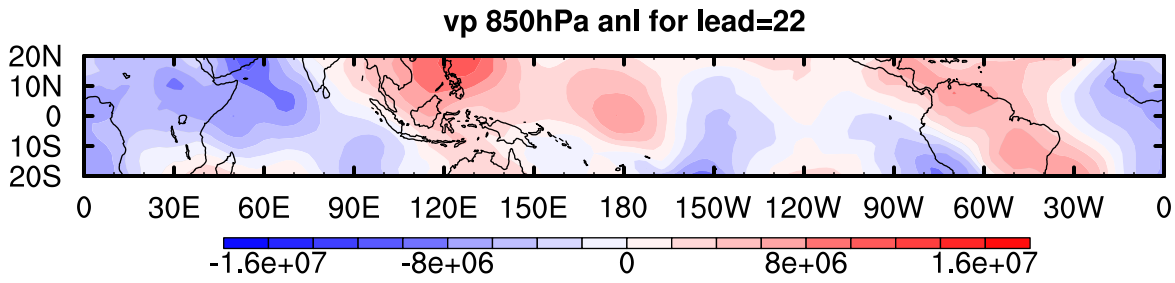

sf 200hPa anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

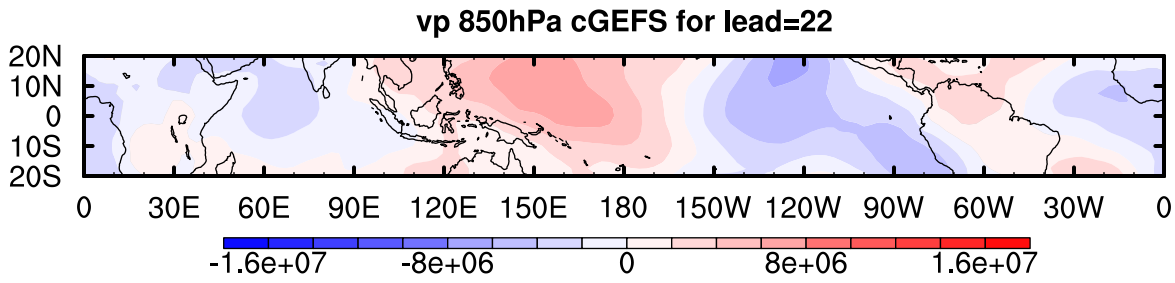

sf 200hPa cGEFS for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

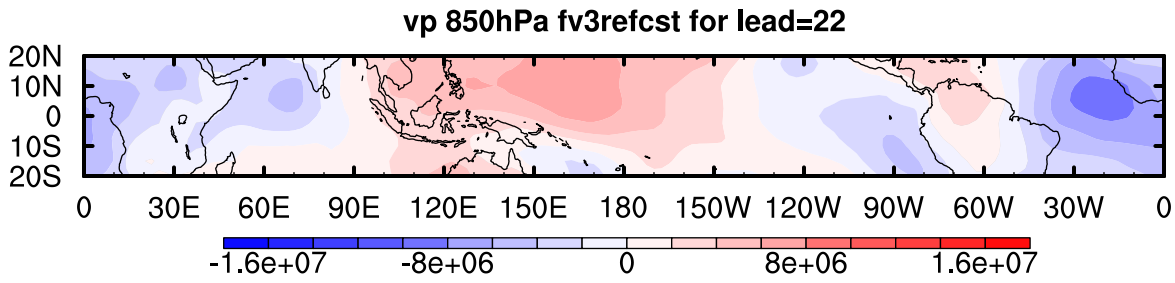

sf 200hPa fv3refcst for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

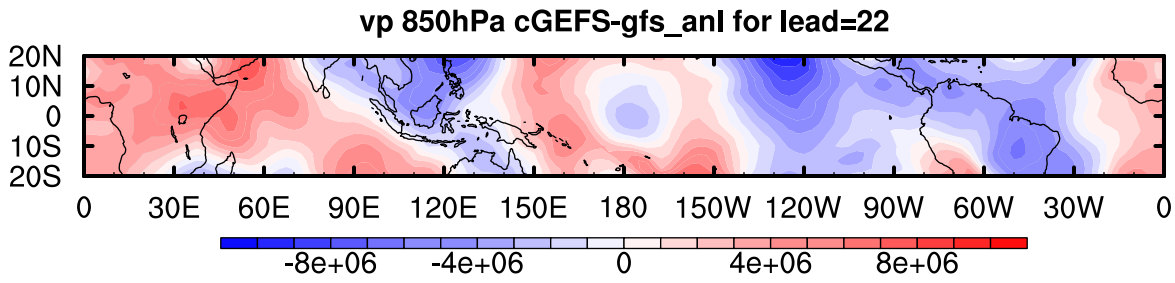

sf 200hPa cGEFS-gfs_anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

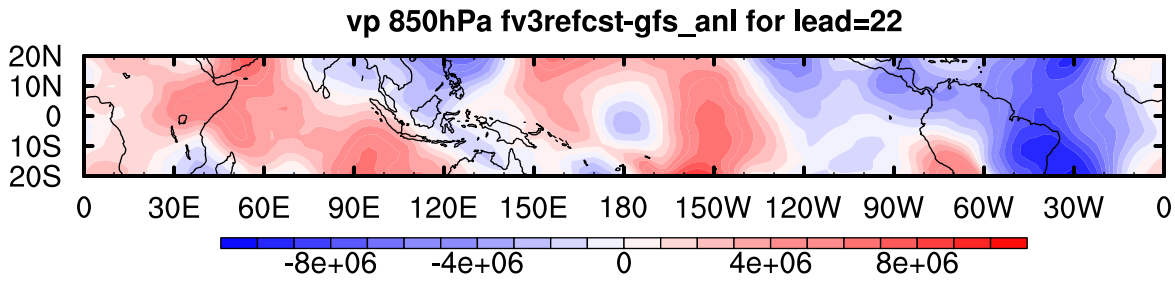

sf 200hPa fv3refcst-gfs_anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

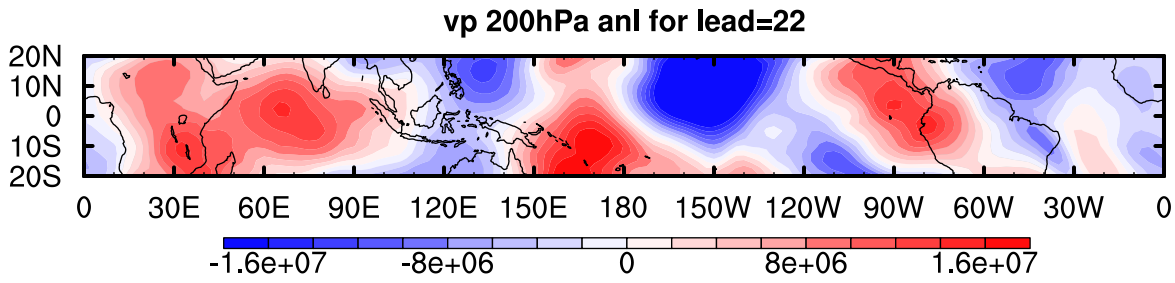

vp 850hPa anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

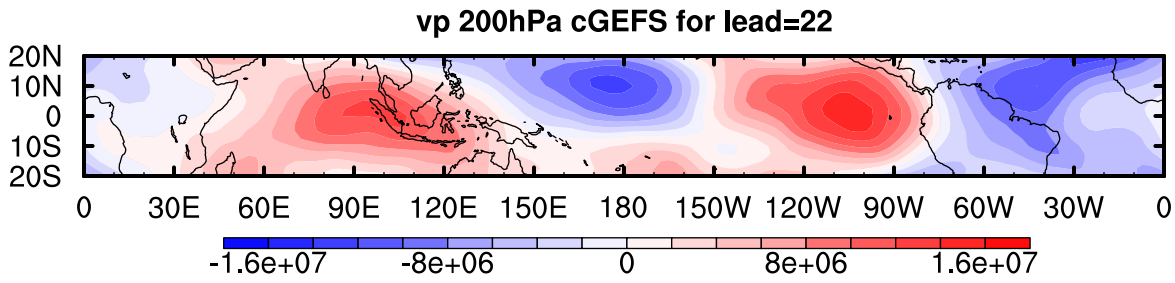

vp 850hPa cGEFS for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

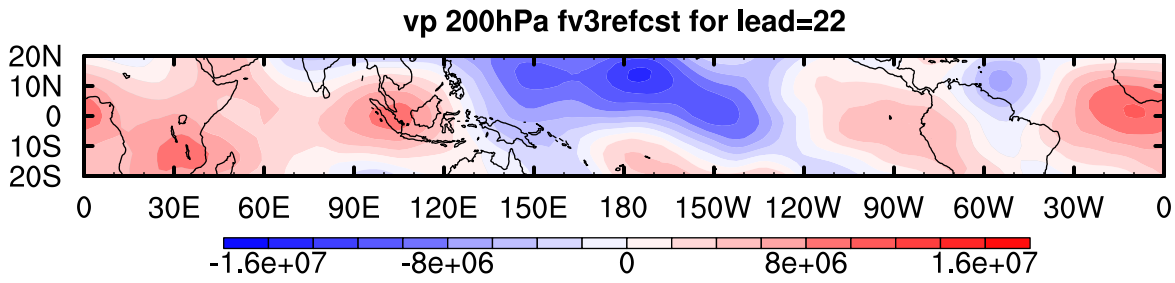

vp 850hPa fv3refcst for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

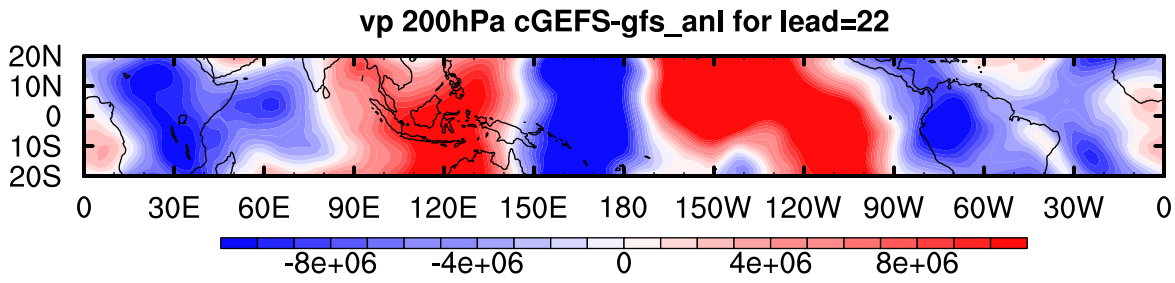

vp 850hPa cGEFS-gfs_anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

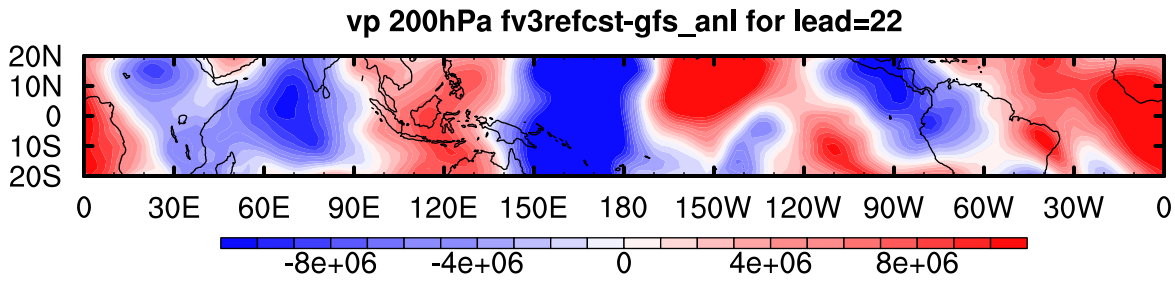

vp 850hPa fv3refcst-gfs_anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

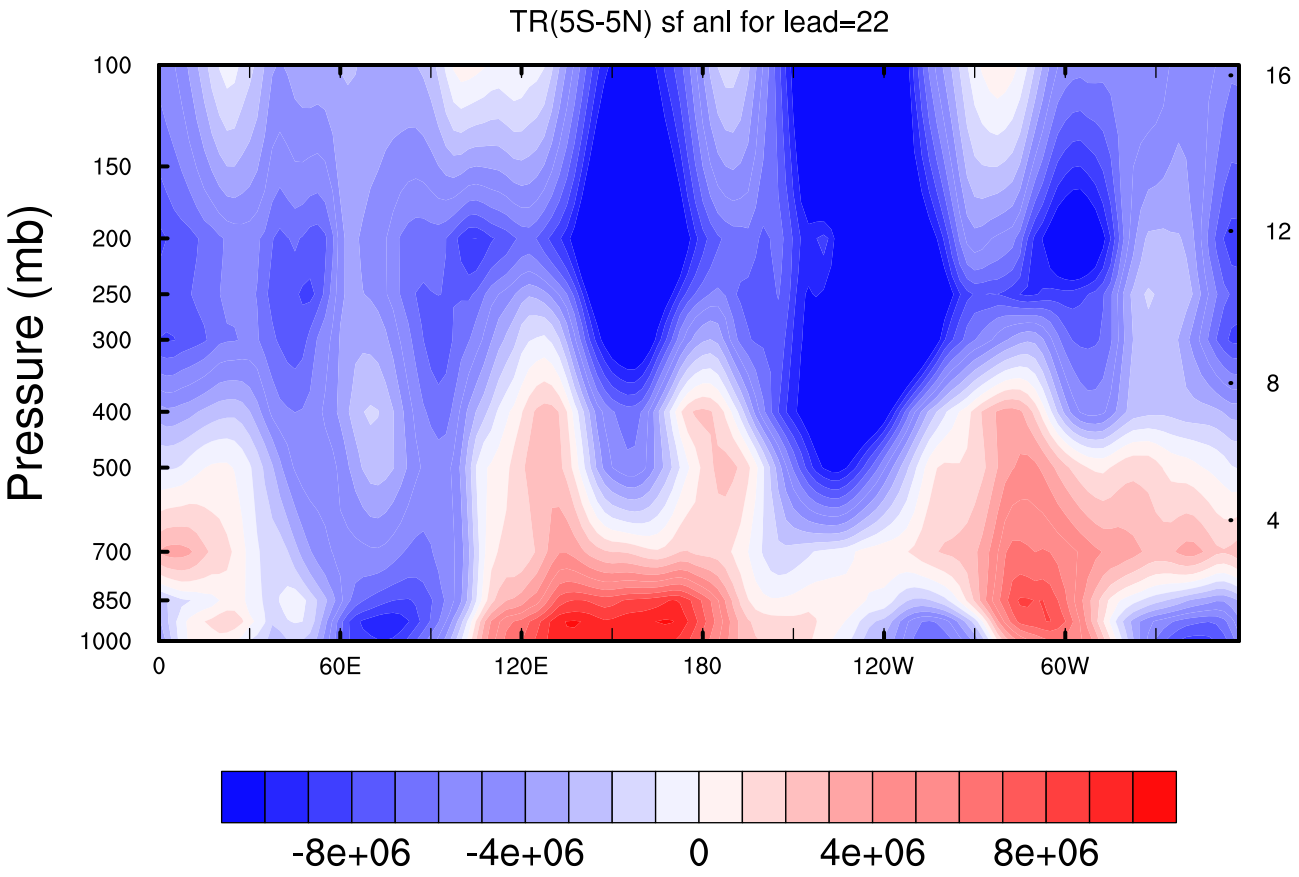

vp 200hPa anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

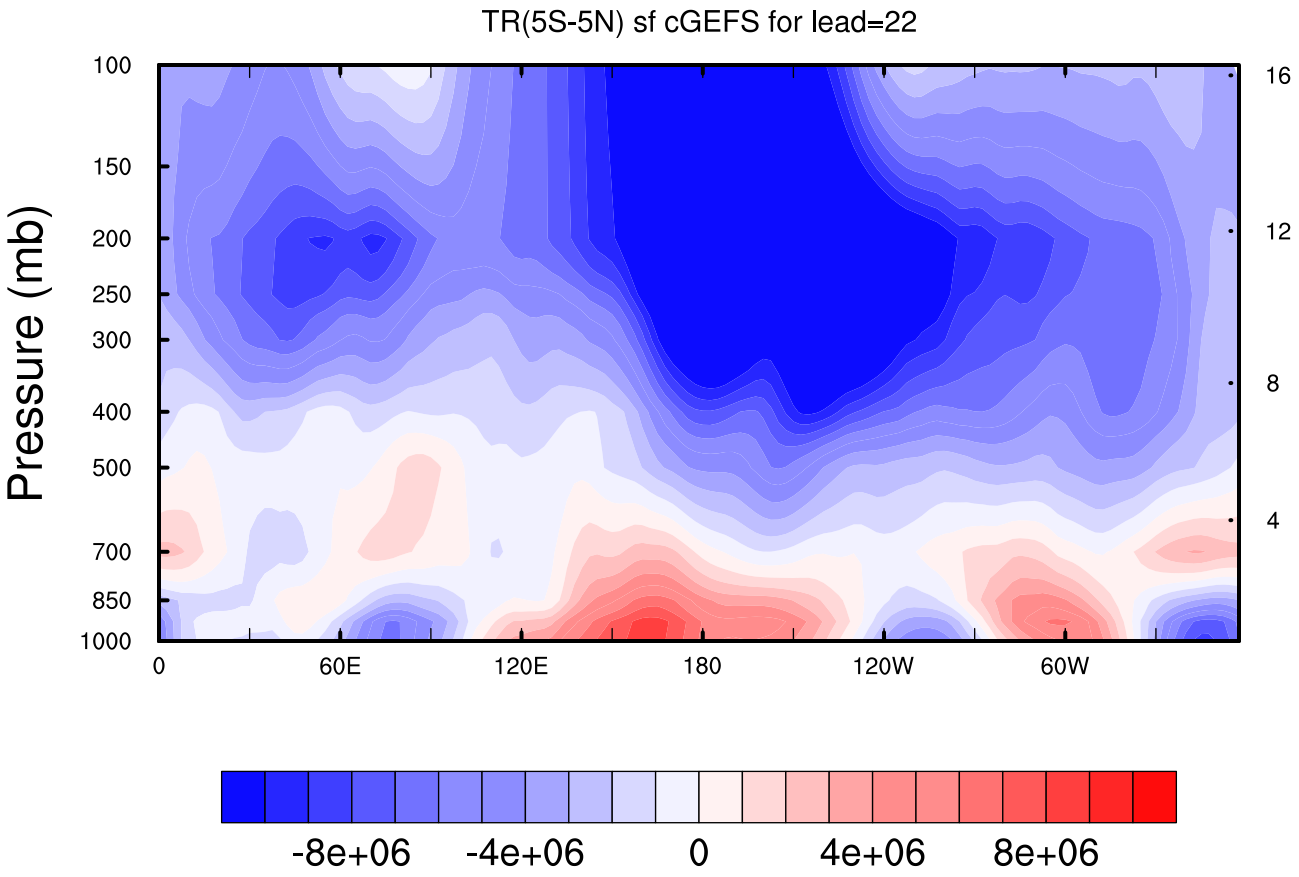

vp 200hPa cGEFS for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

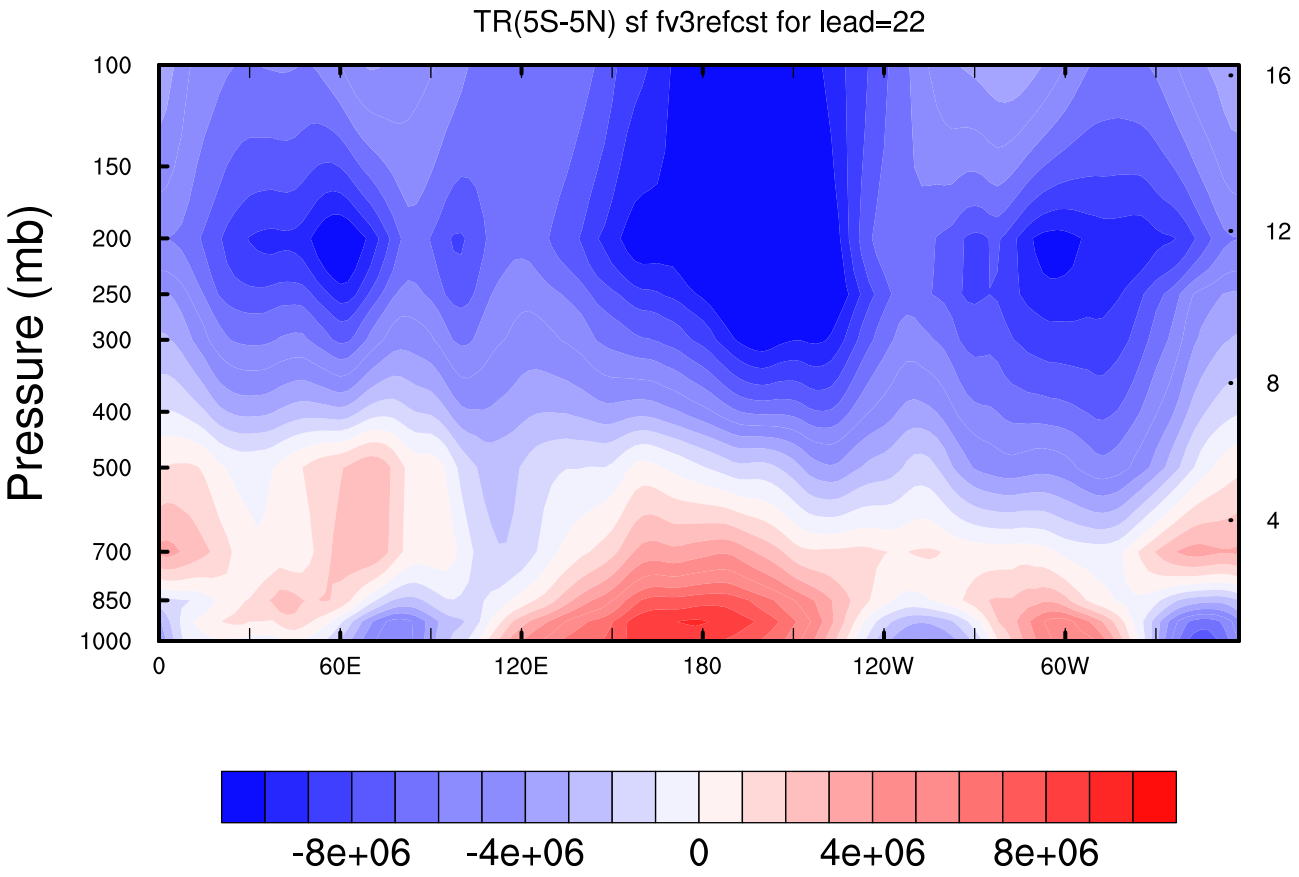

vp 200hPa fv3refcst for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

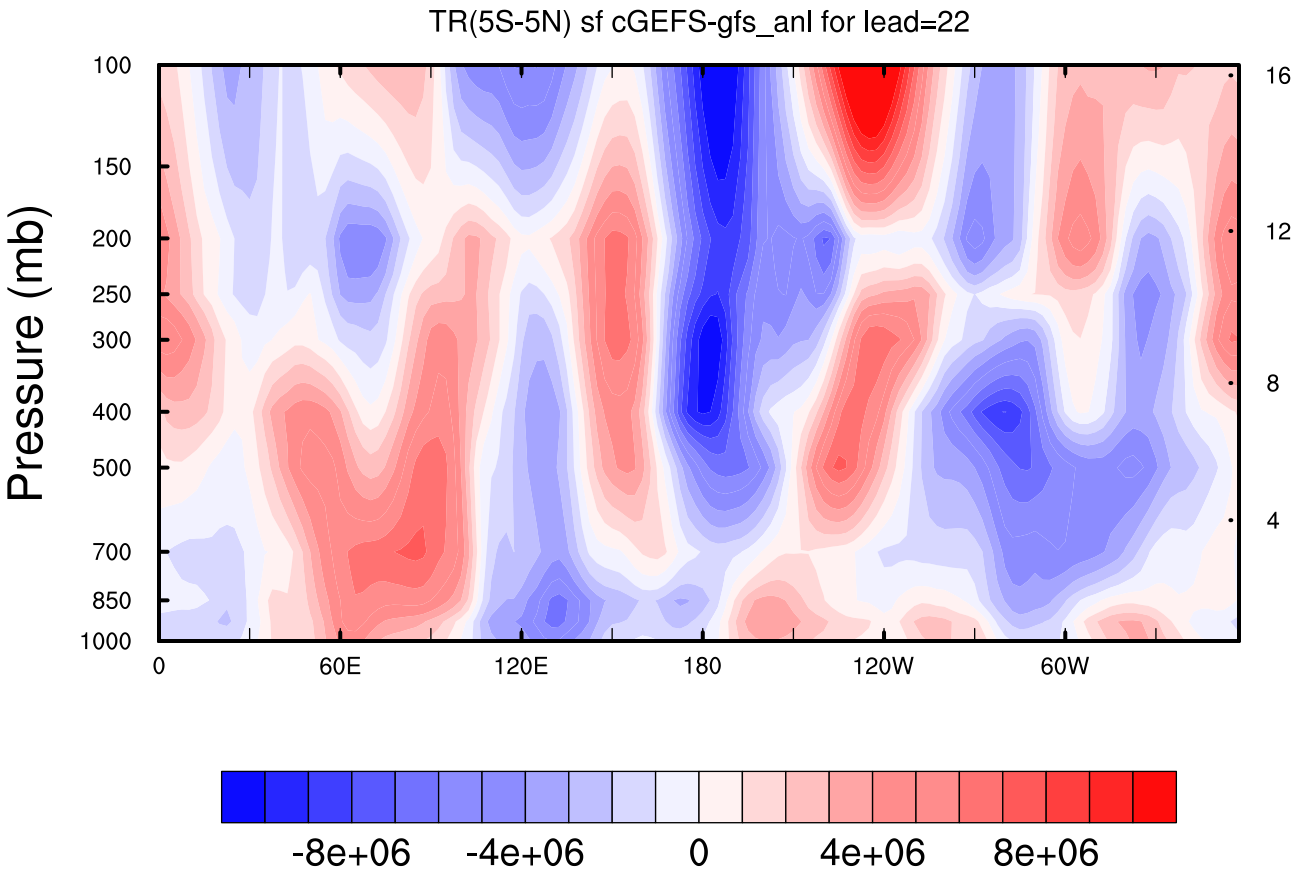

vp 200hPa cGEFS-gfs_anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

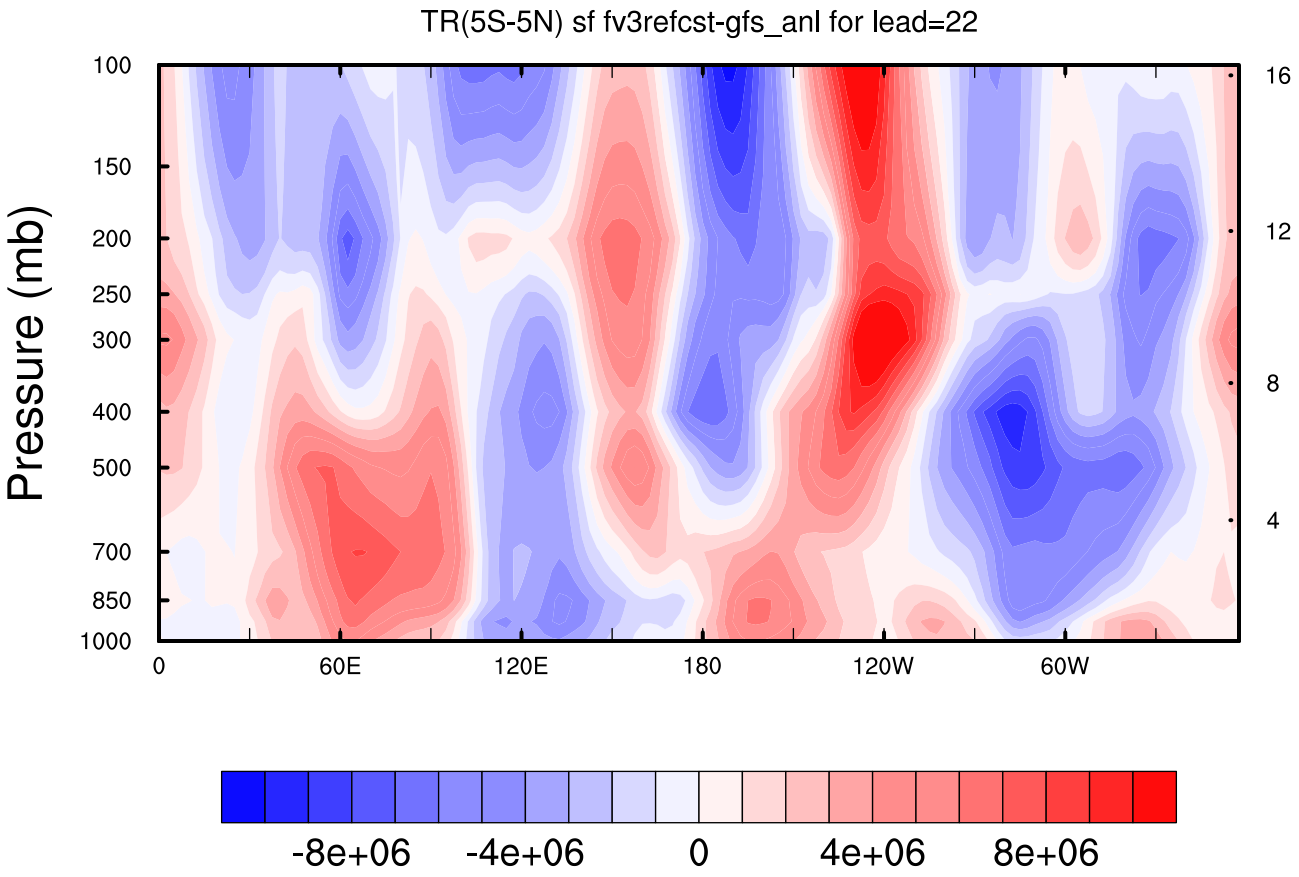

vp 200hPa fv3refcst-gfs_anl for lead=22
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

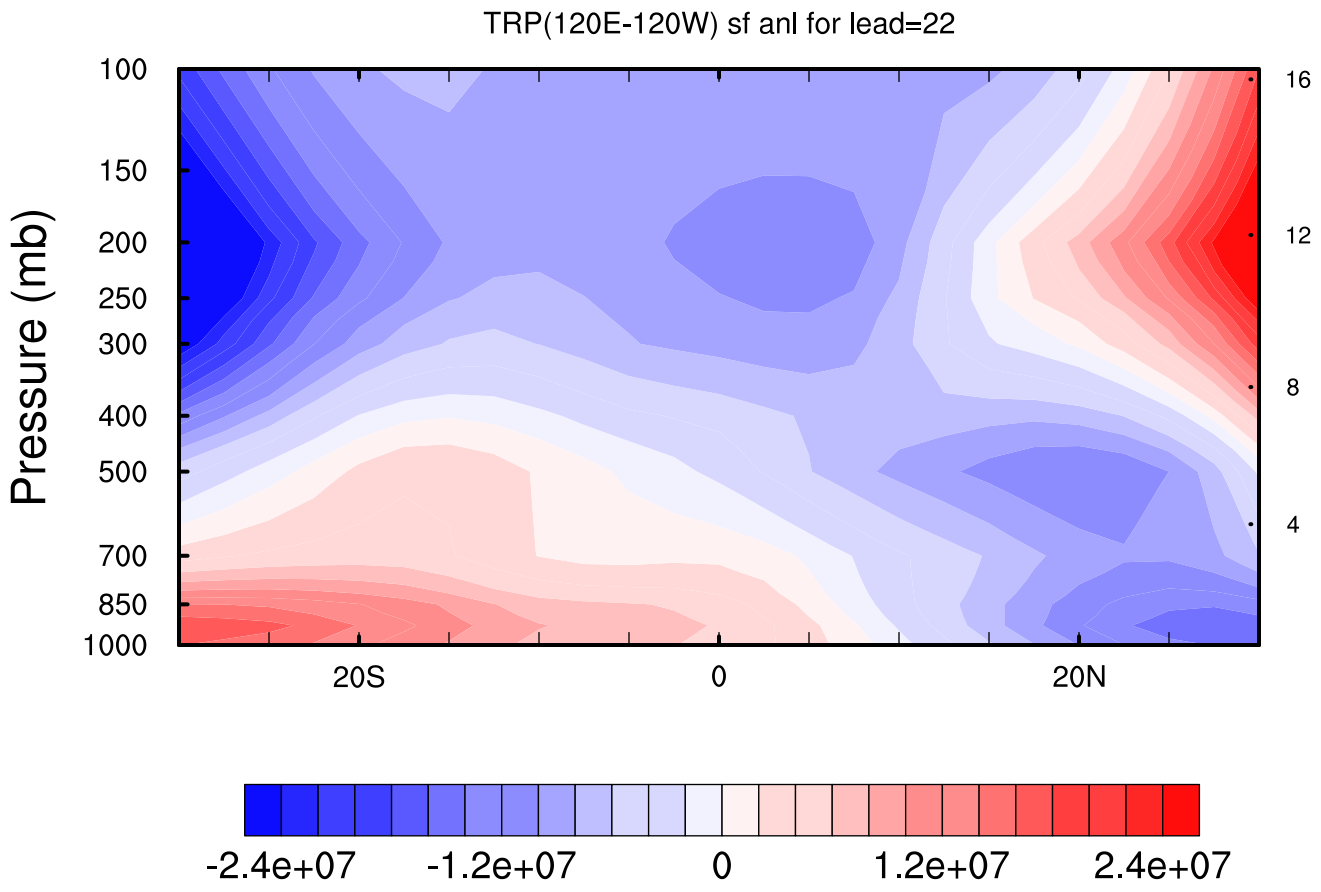

TR(5S-5N) sf anl for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

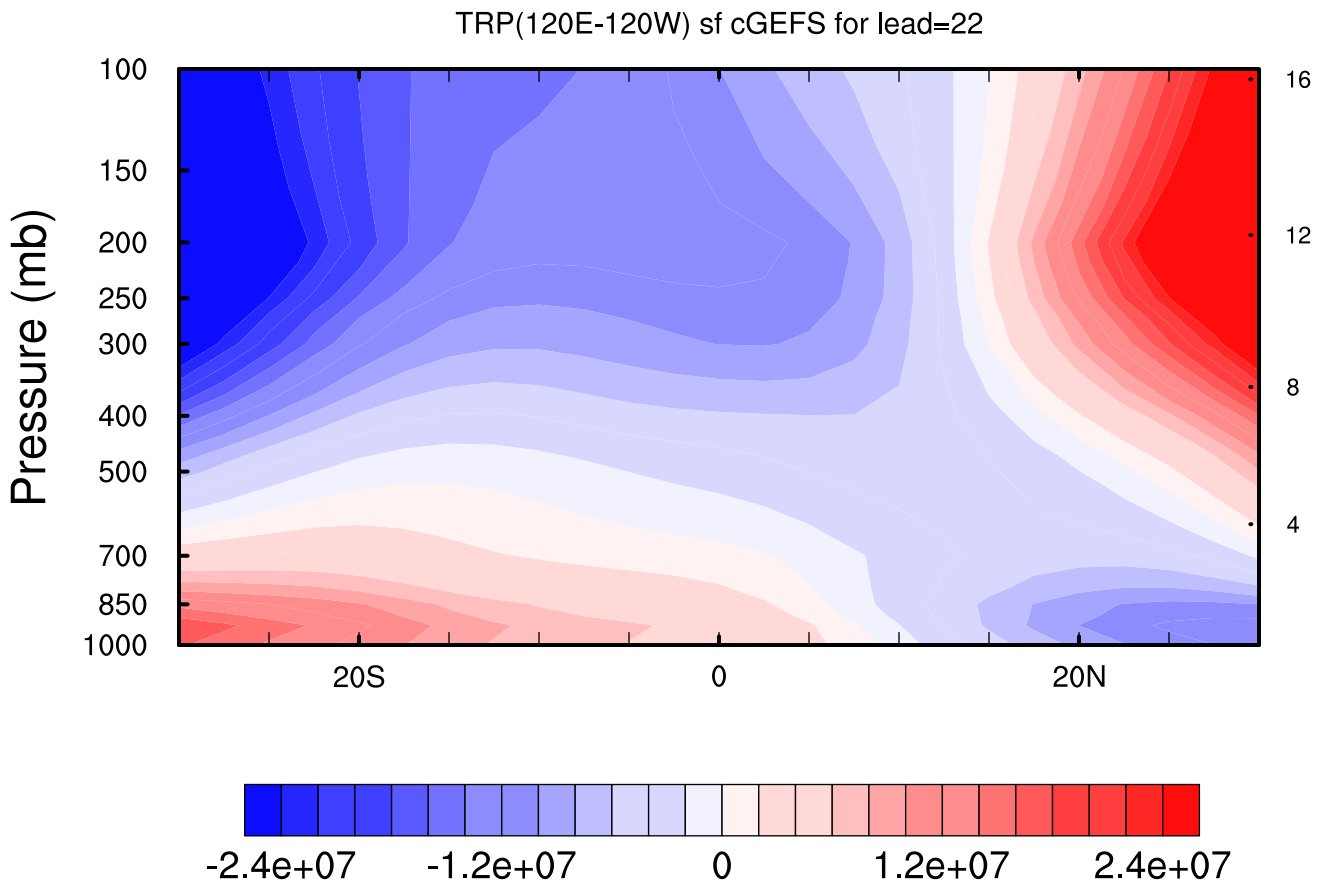

TR(5S-5N) sf cGEFS for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

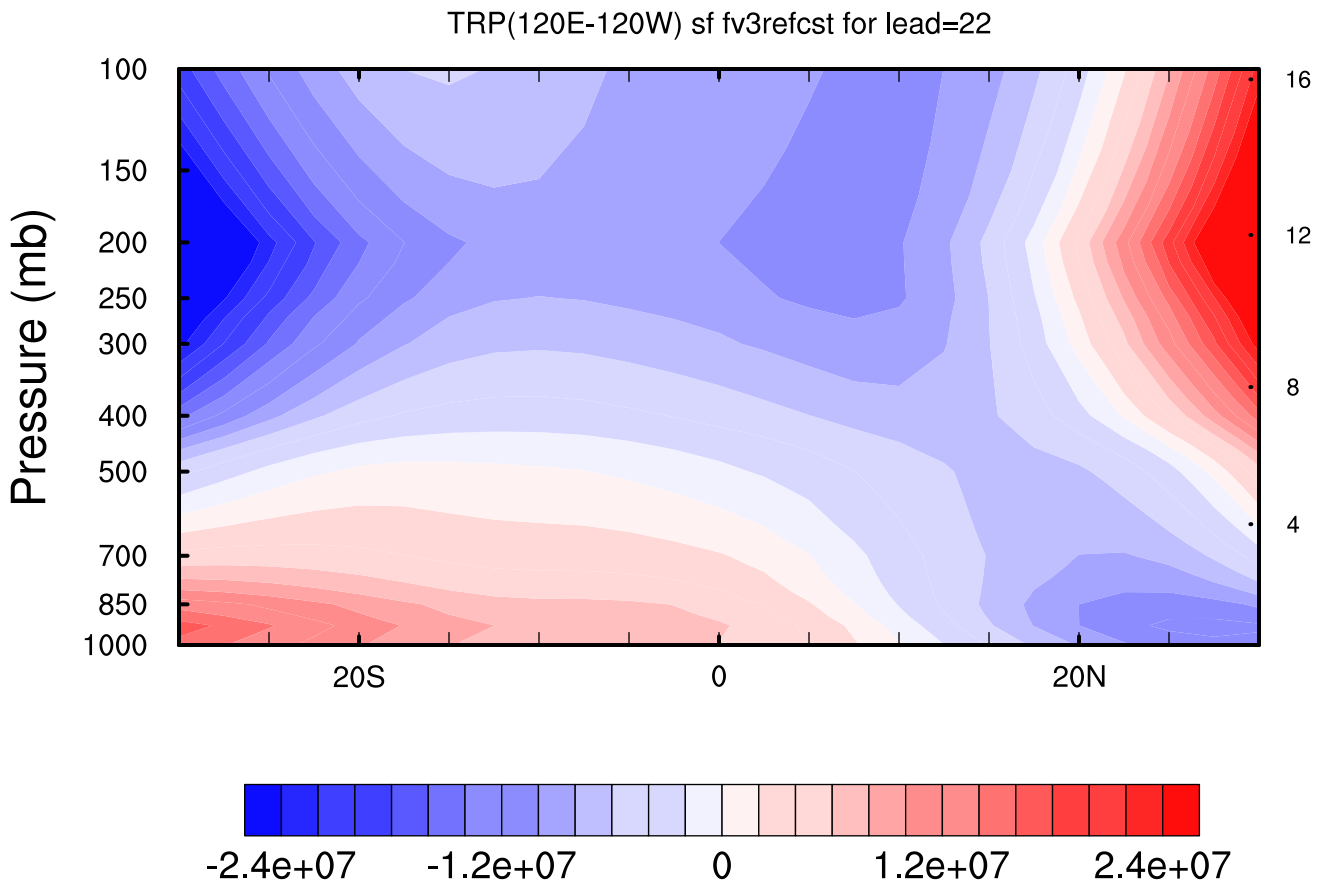

TR(5S-5N) sf fv3refcst for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

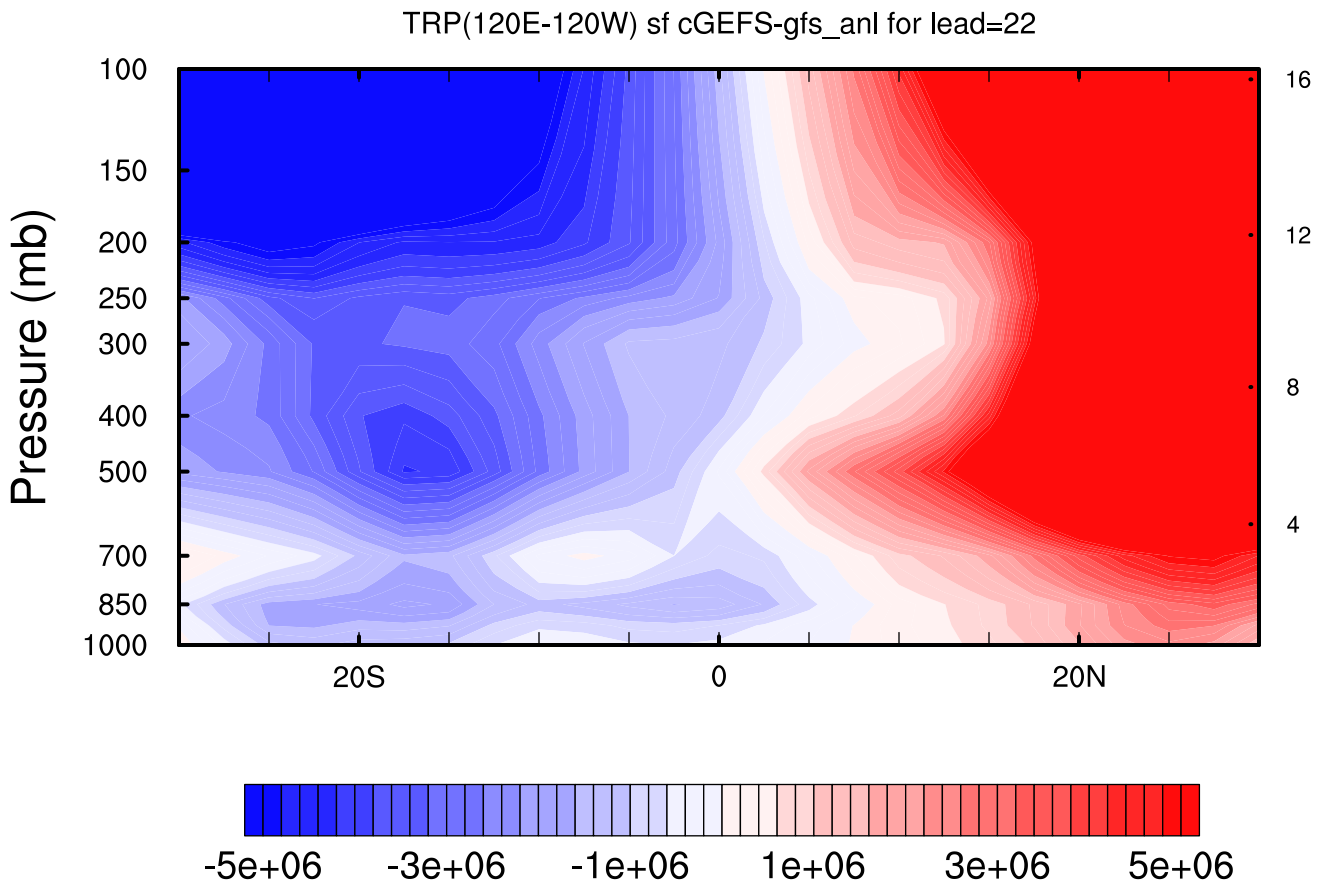

TR(5S-5N) sf cGEFS-gfs_anl for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

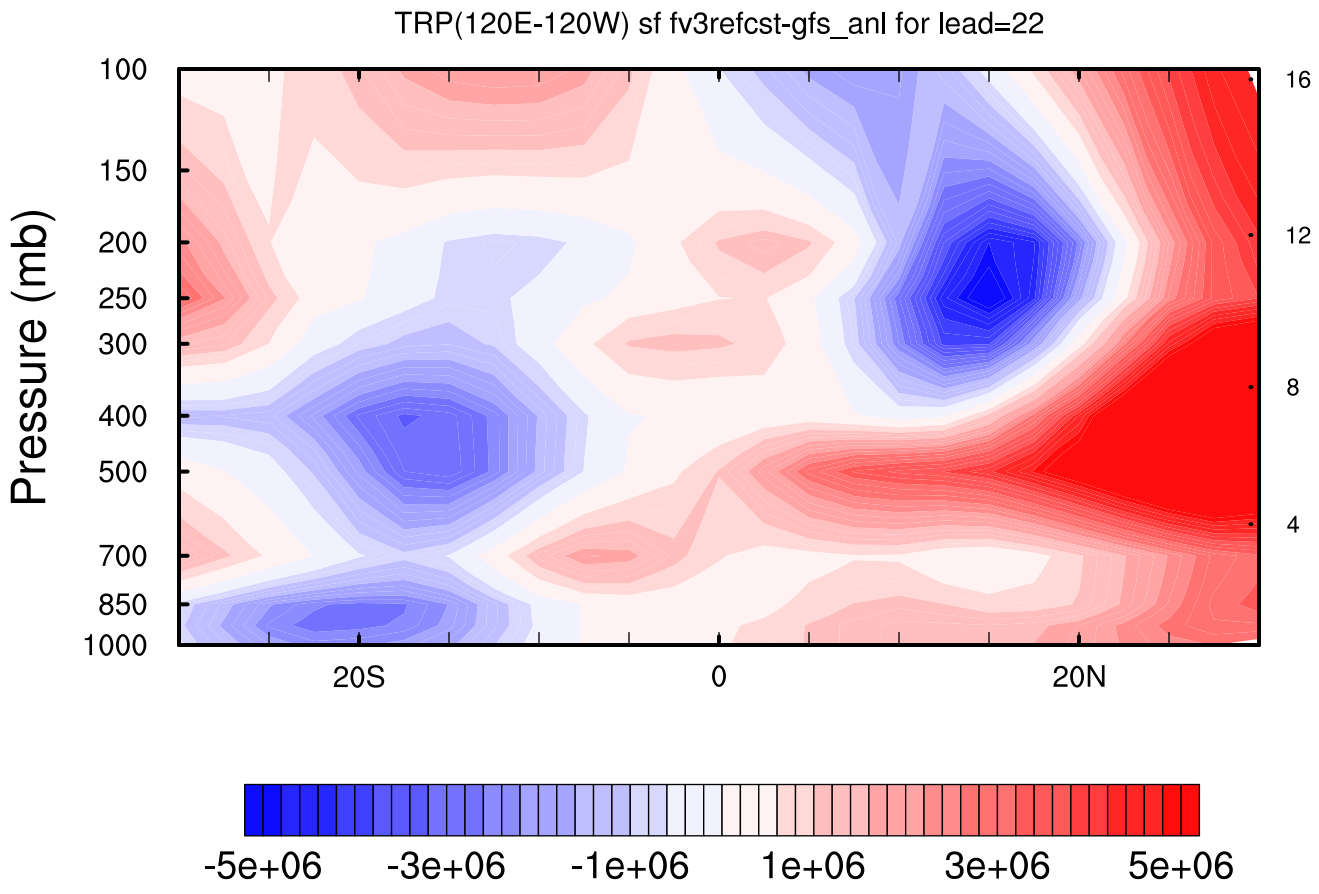

TR(5S-5N) sf fv3refcst-gfs_anl for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

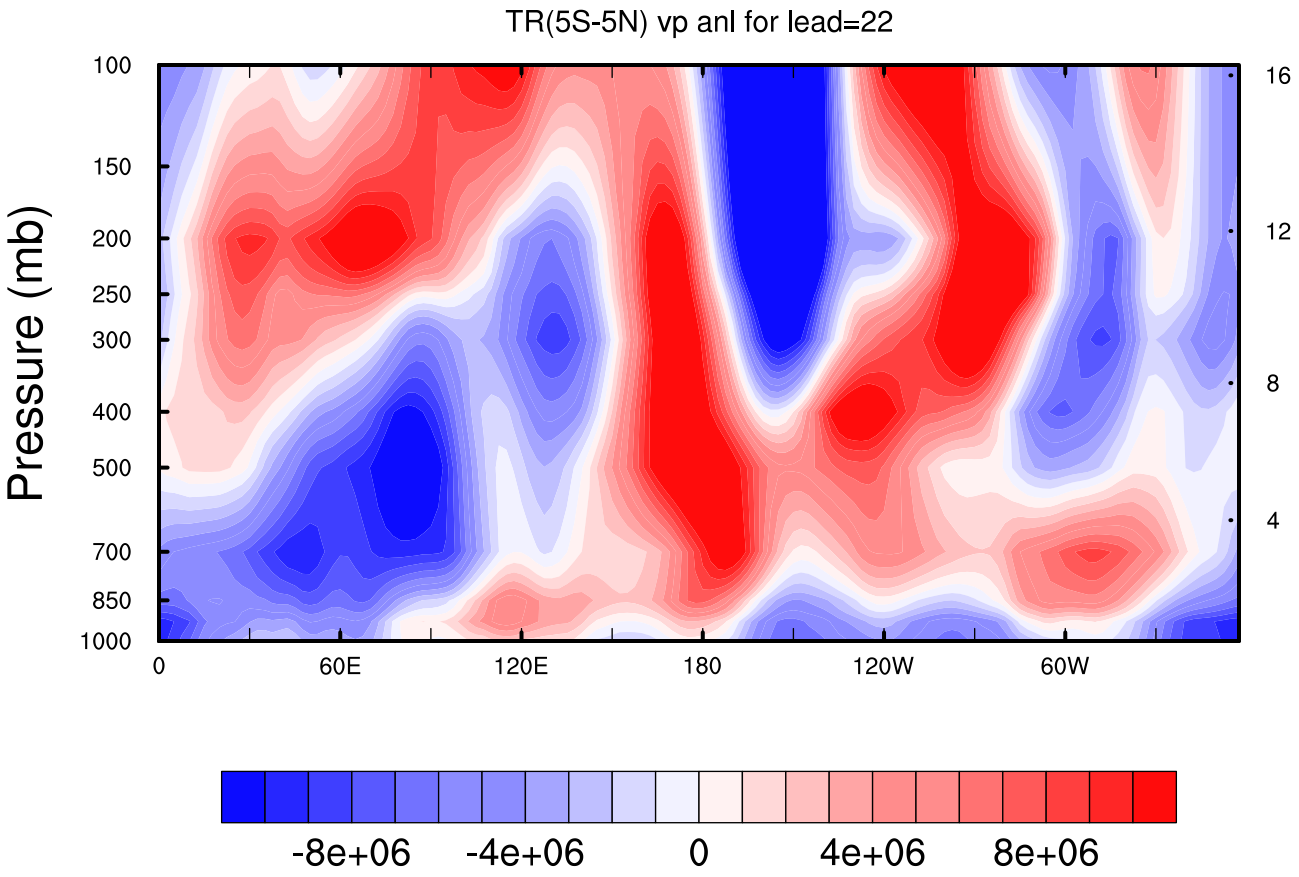

TRP(120E-120W) sf anl for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

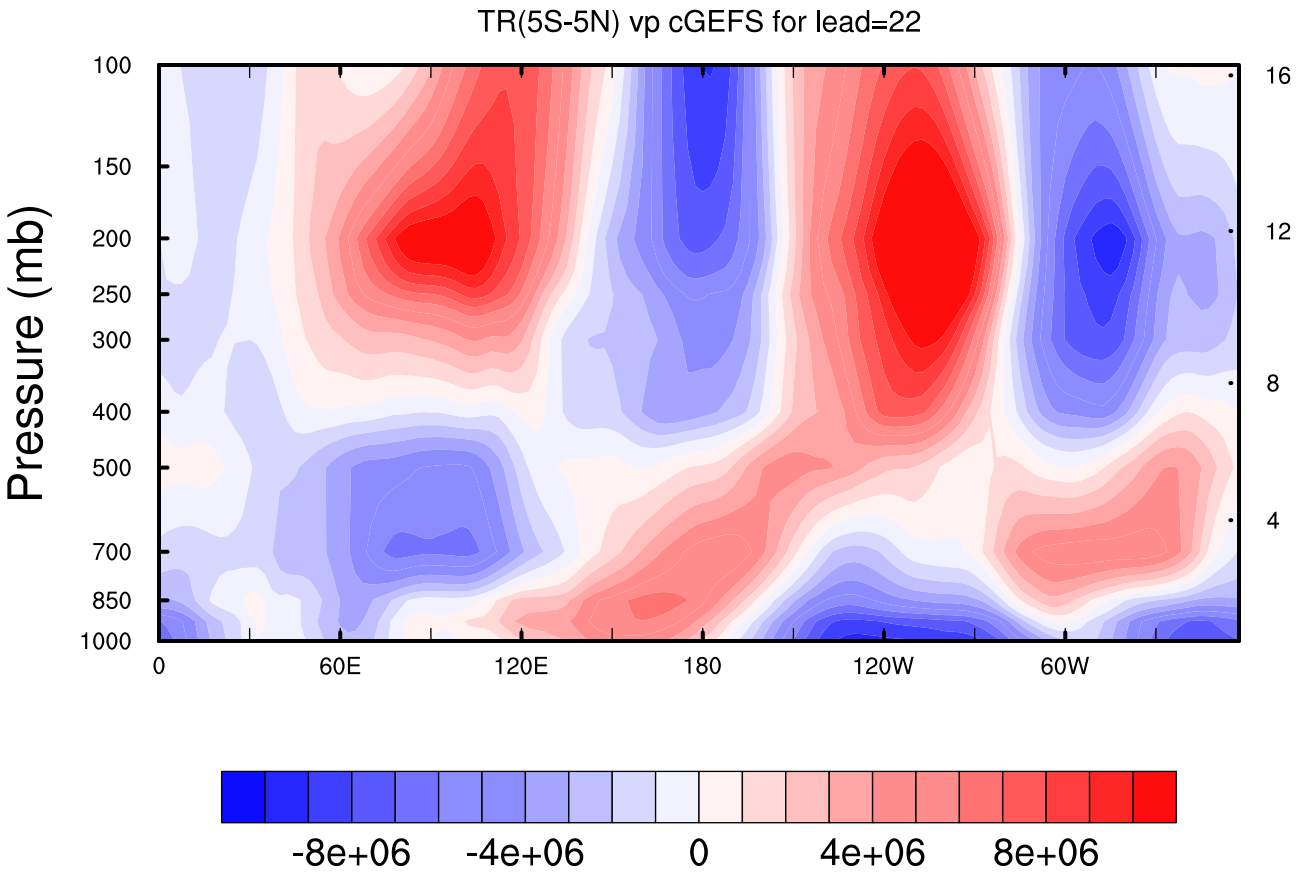

TRP(120E-120W) sf cGEFS for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

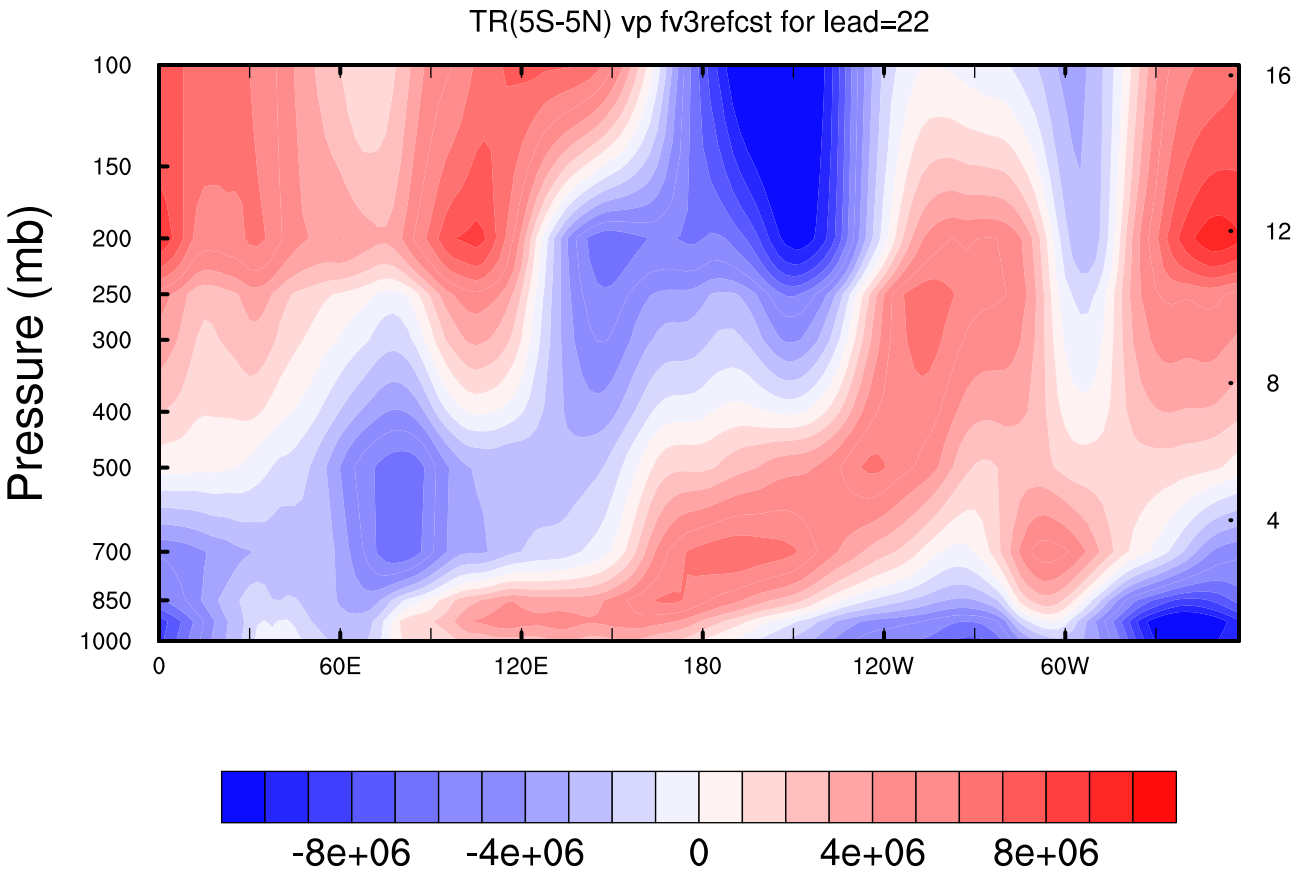

TRP(120E-120W) sf fv3refcst for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

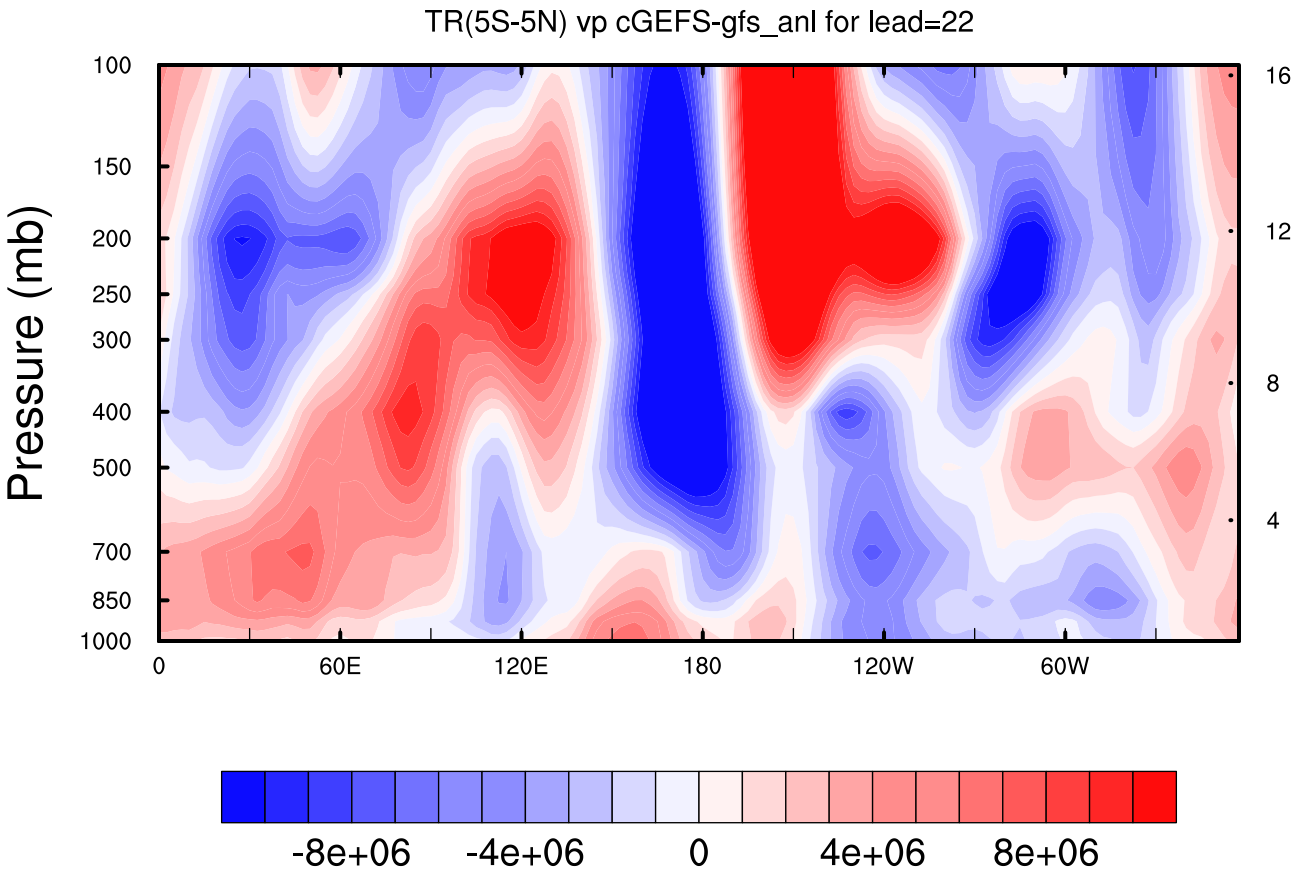

TRP(120E-120W) sf cGEFS-gfs_anl for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

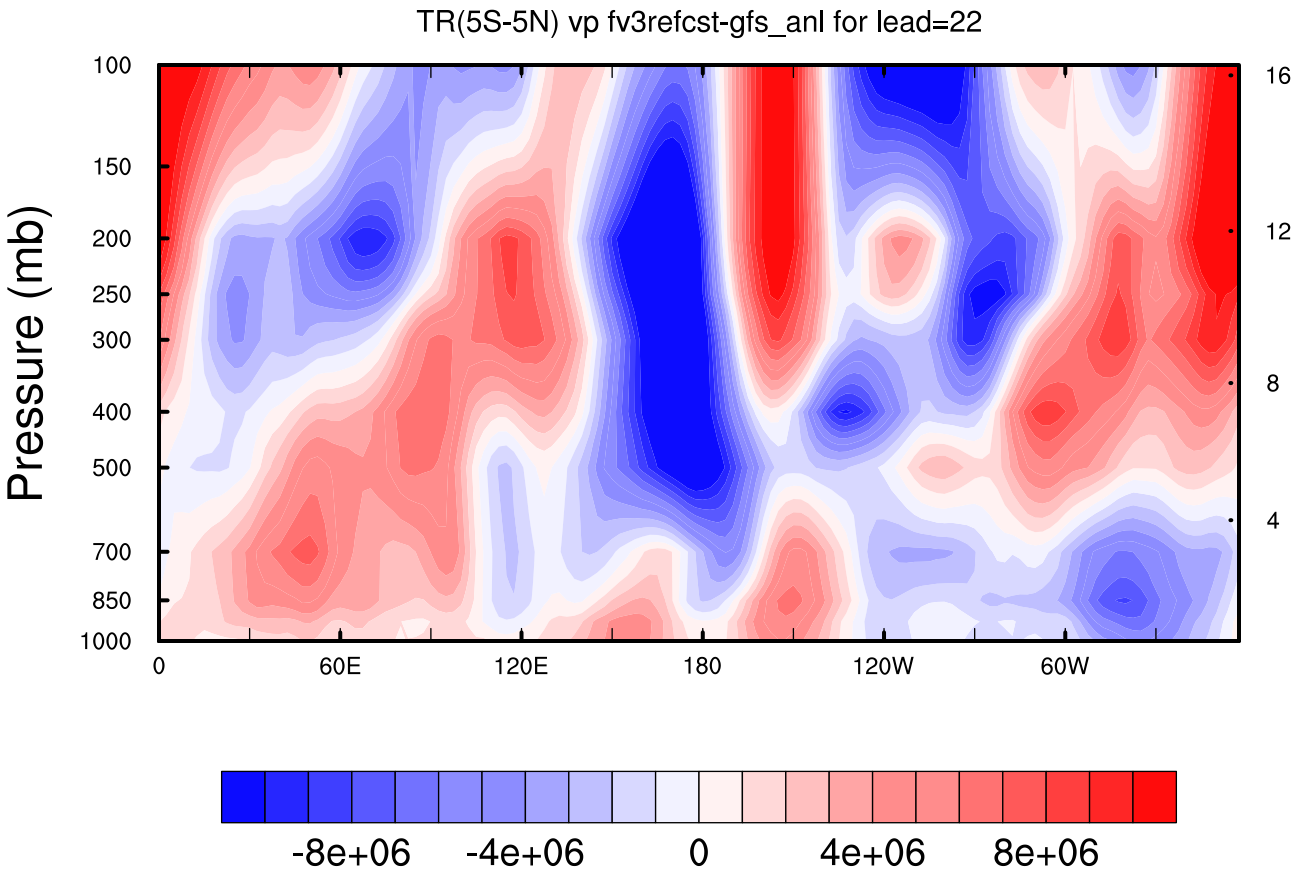

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06


TR(5S-5N) vp anl for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS-gfs_anl for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst-gfs_anl for lead=22
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
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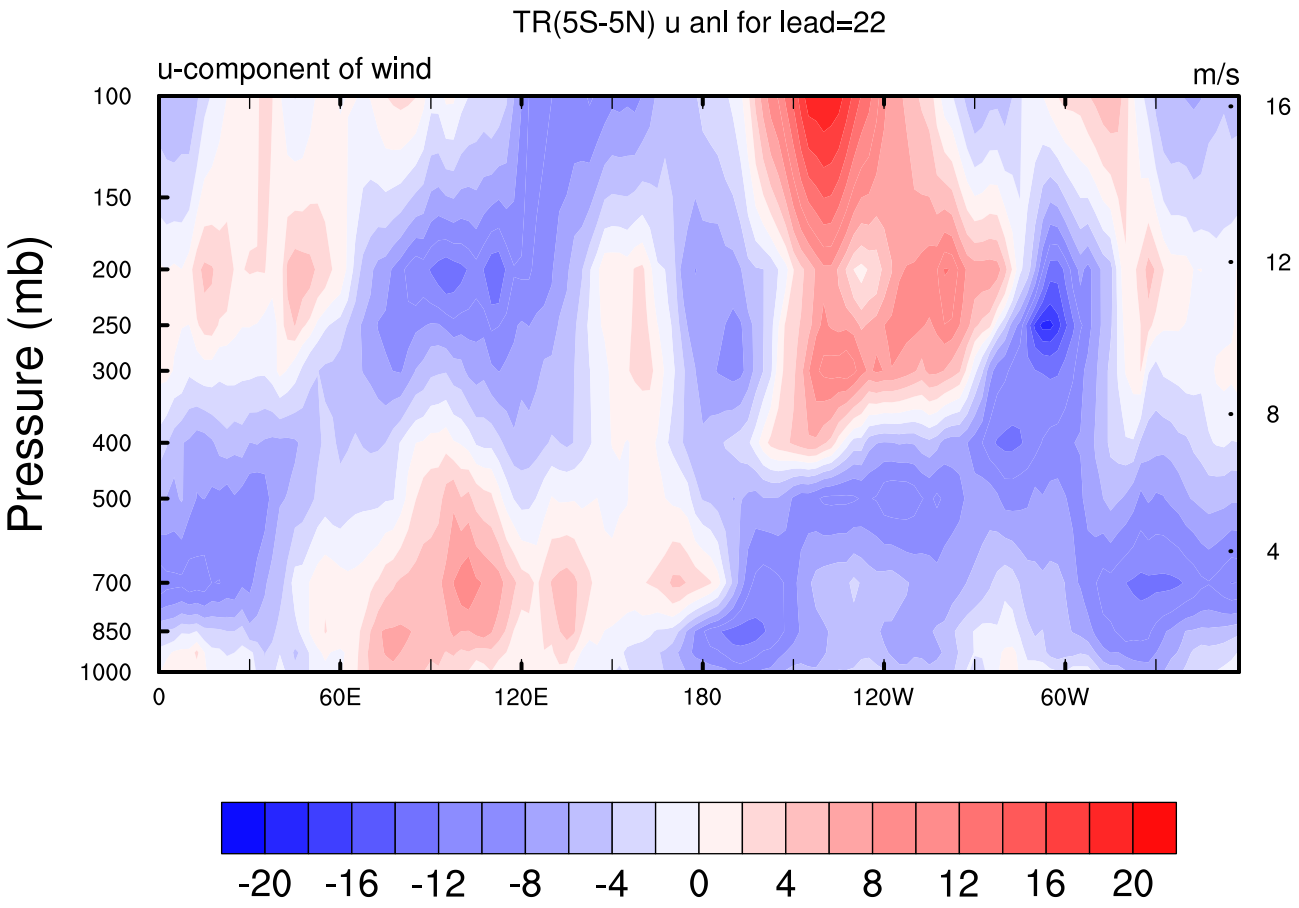
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) u anl for lead=22
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
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-8
-4
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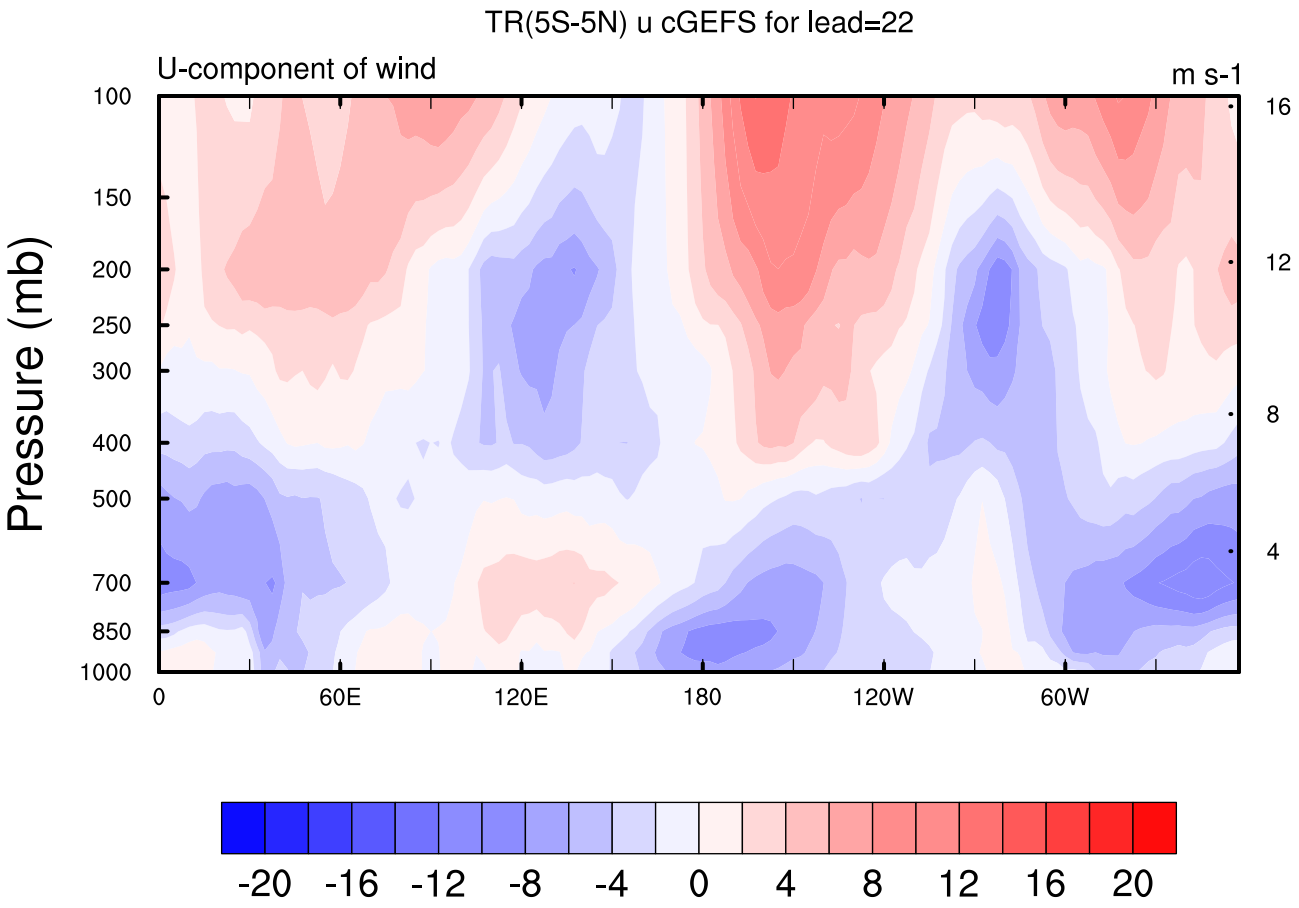
4
8
12
16
20


TR(5S-5N) u cGEFS for lead=22
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
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-20
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-12
-8
-4
0
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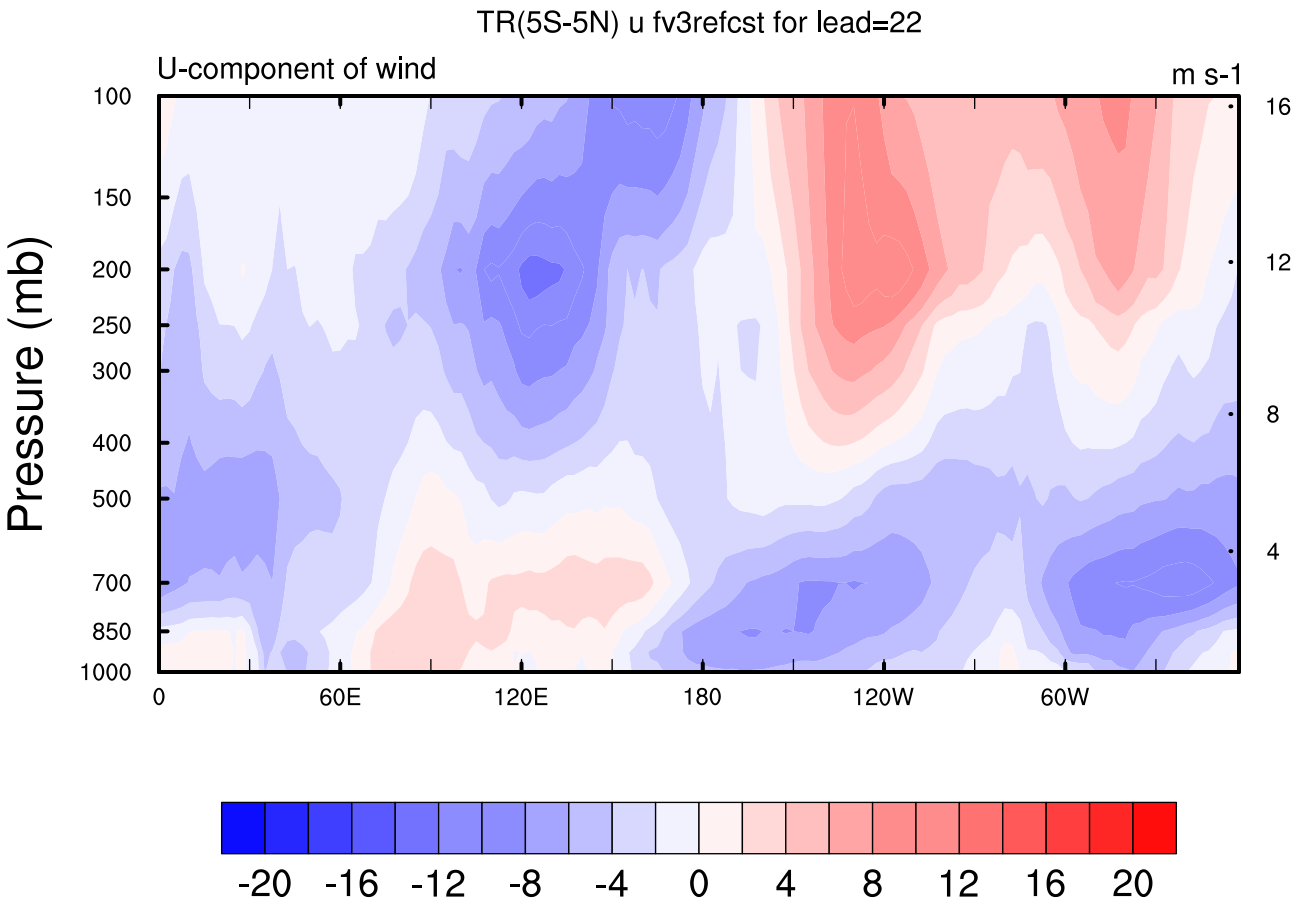
8
12
16
20


TR(5S-5N) u fv3refcst for lead=22
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
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12
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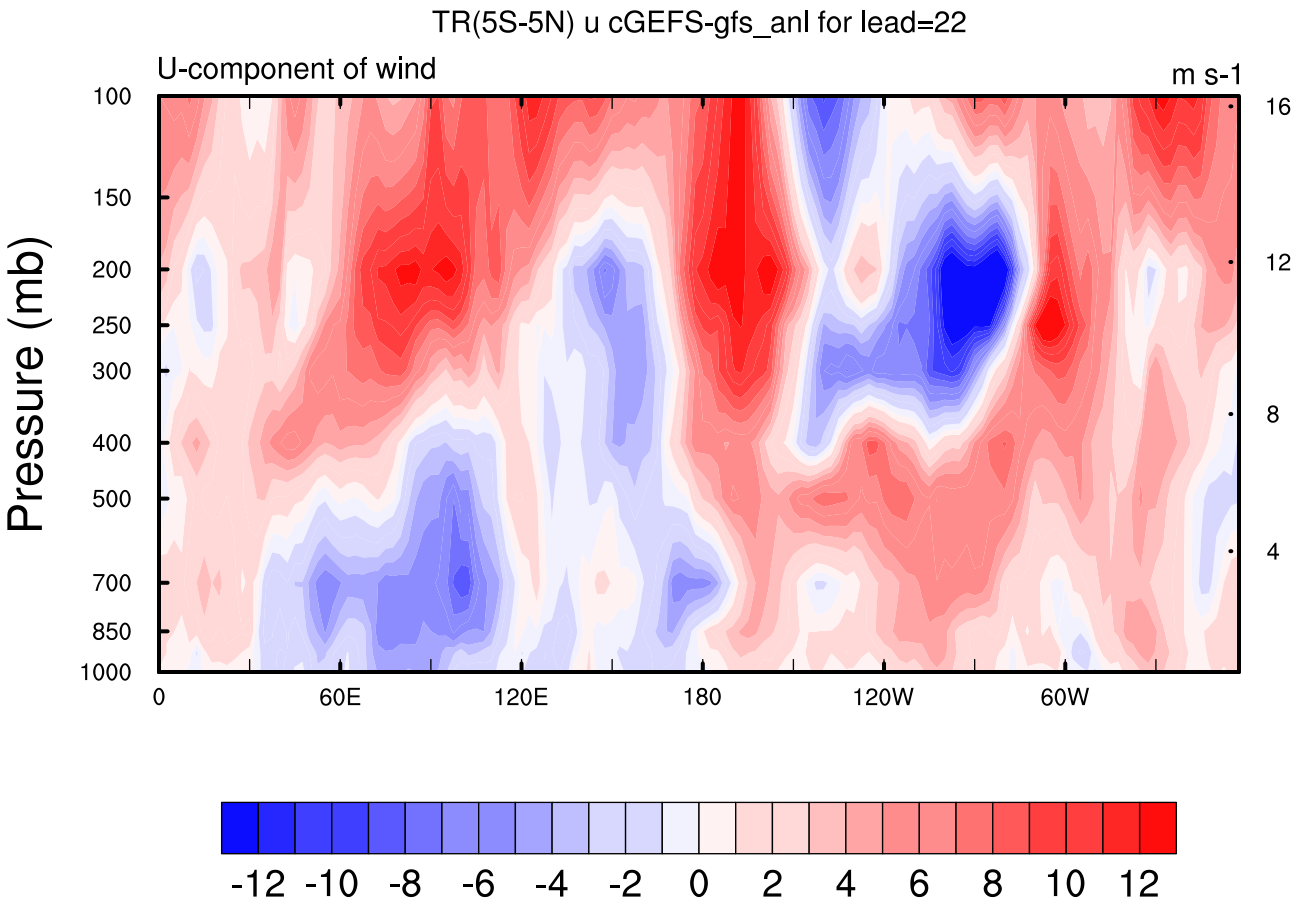
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=22
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
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400
500
700
850
1000
0
60E
120E
180
120W
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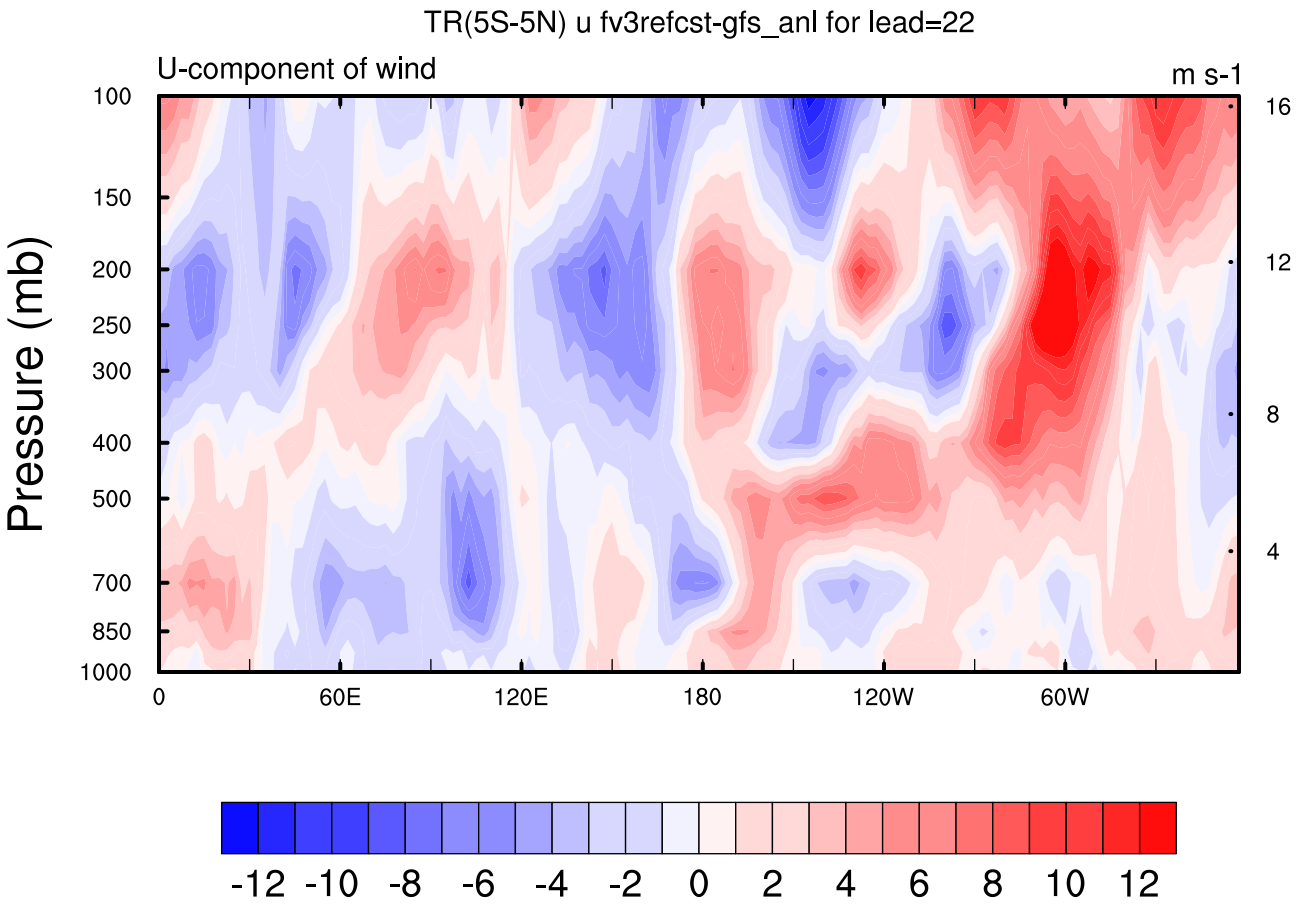
TR(5S-5N) u fv3refcst-gfs_anl for lead=22
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
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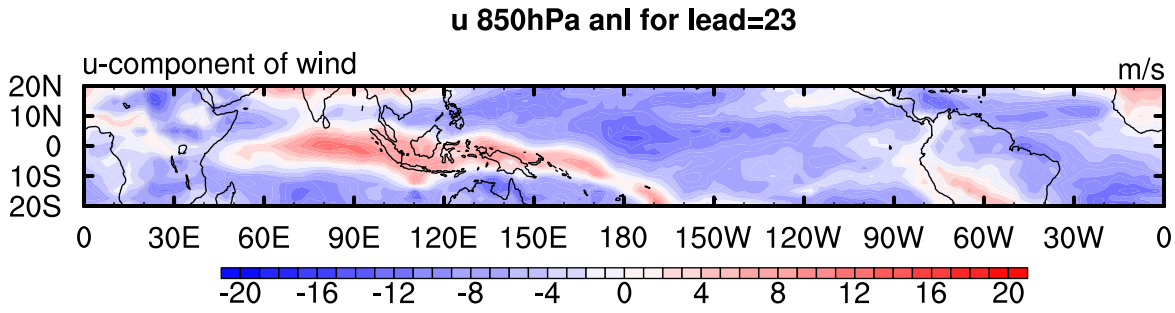
u 850hPa anl for lead=23
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-20
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-12
-8
-4
0
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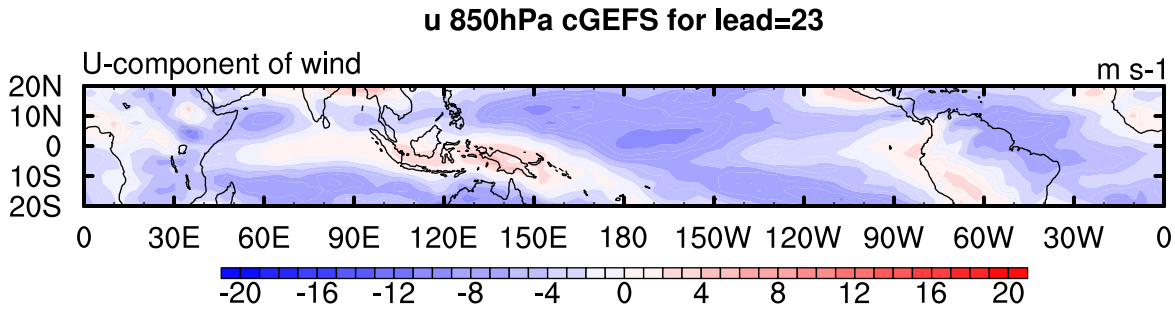
8
12
16
20


u 850hPa cGEFS for lead=23
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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-4
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16
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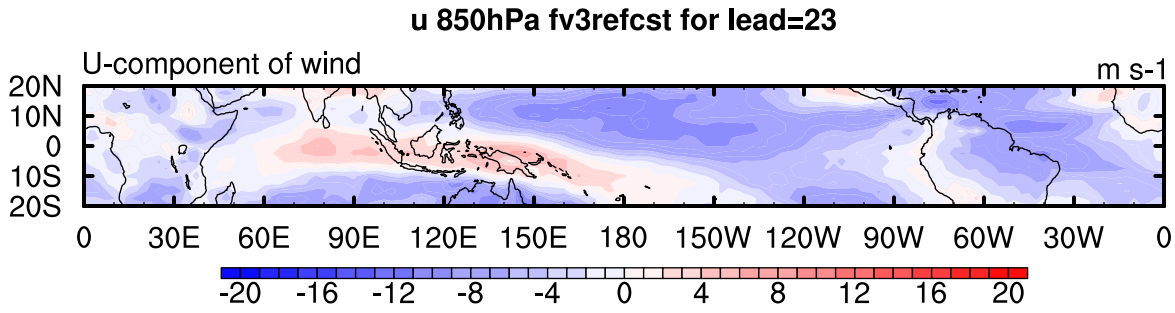
u 850hPa fv3refcst for lead=23
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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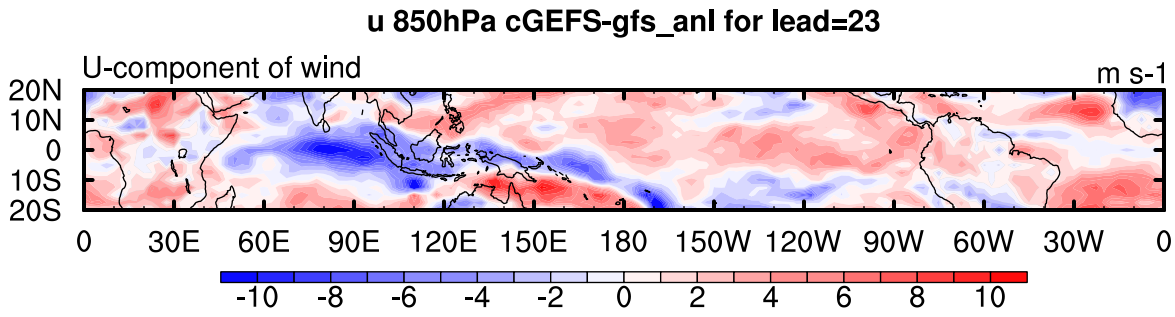
u 850hPa cGEFS-gfs_anl for lead=23
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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60W
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-10
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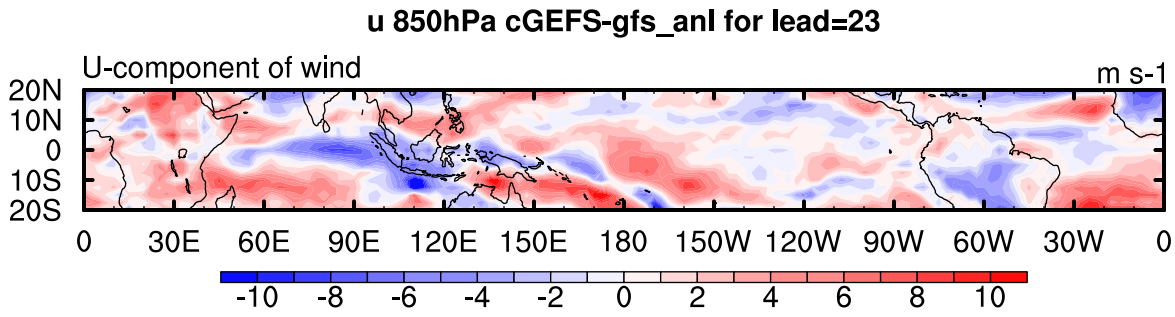
u 850hPa cGEFS-gfs_anl for lead=23
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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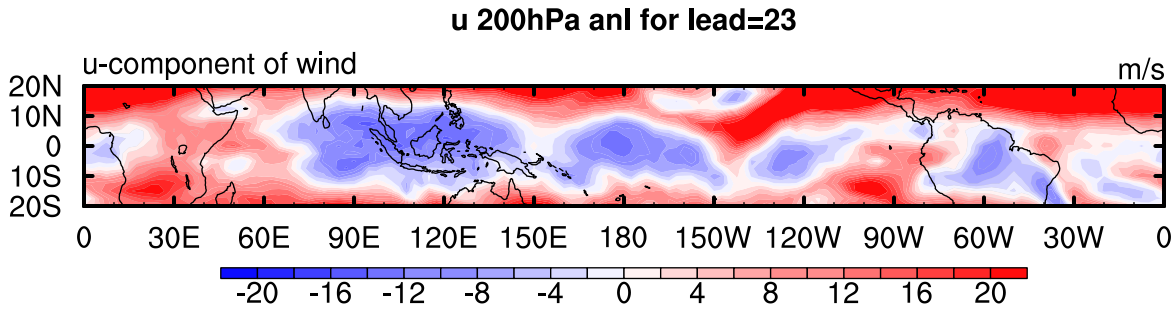
u 200hPa anl for lead=23
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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16
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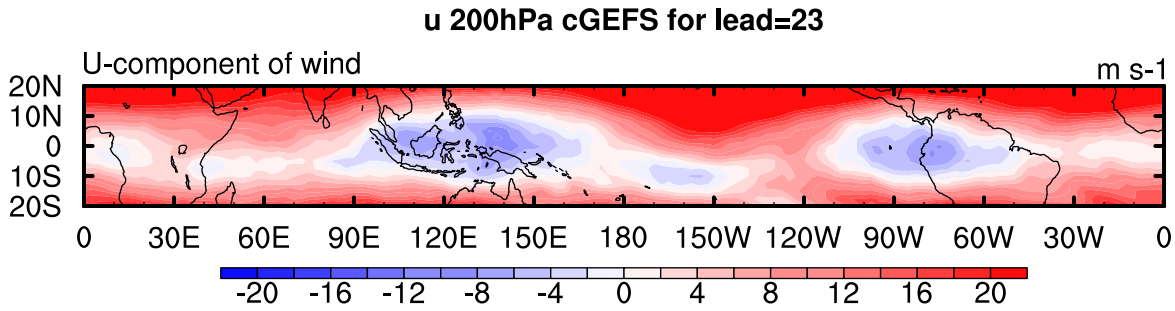
u 200hPa cGEFS for lead=23
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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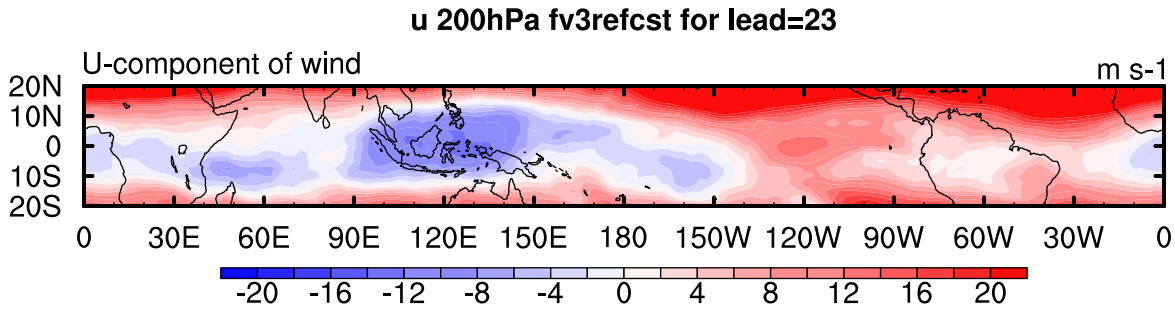
u 200hPa fv3refcst for lead=23
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-4
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16
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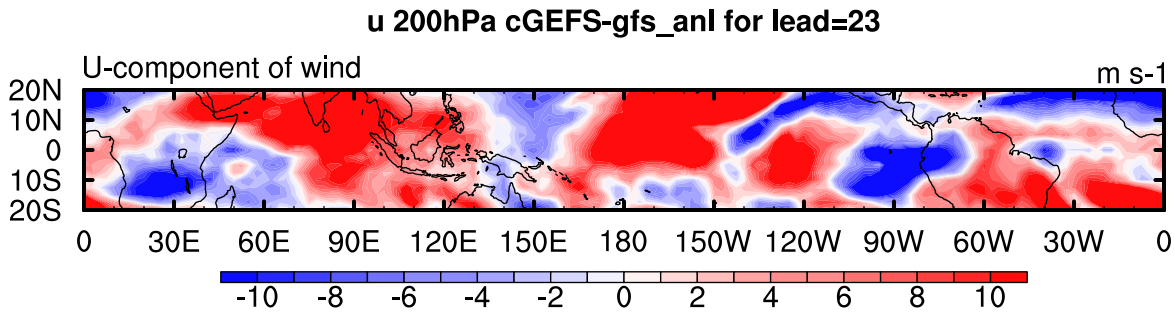
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U-component of wind
m s-1
20N
10N
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10S
20S
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30E
60E
90E
120E
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180
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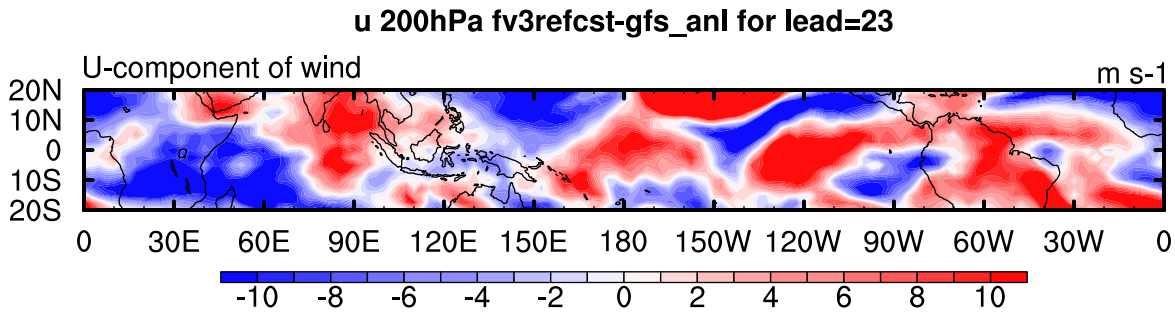
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U-component of wind
m s-1
20N
10N
0
10S
20S
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30E
60E
90E
120E
150E
180
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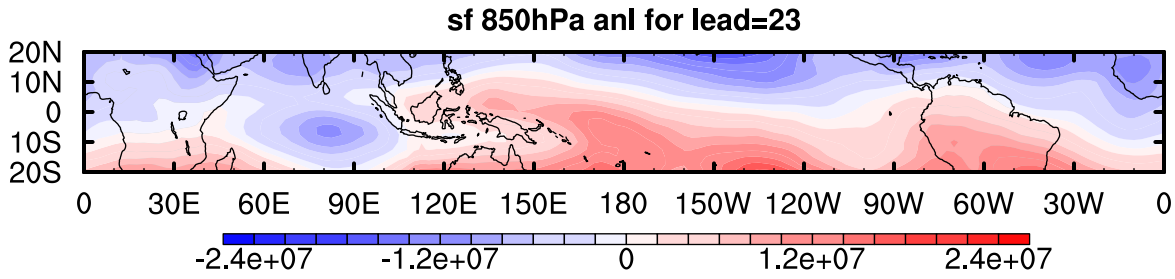
sf 850hPa anl for lead=23
20N
10N
0
10S
20S
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30E
60E
90E
120E
150E
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60W
30W
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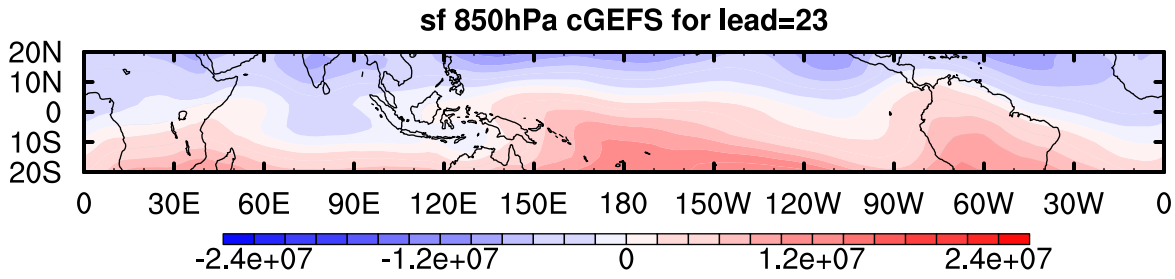
2.4e+07


sf 850hPa cGEFS for lead=23
20N
10N
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10S
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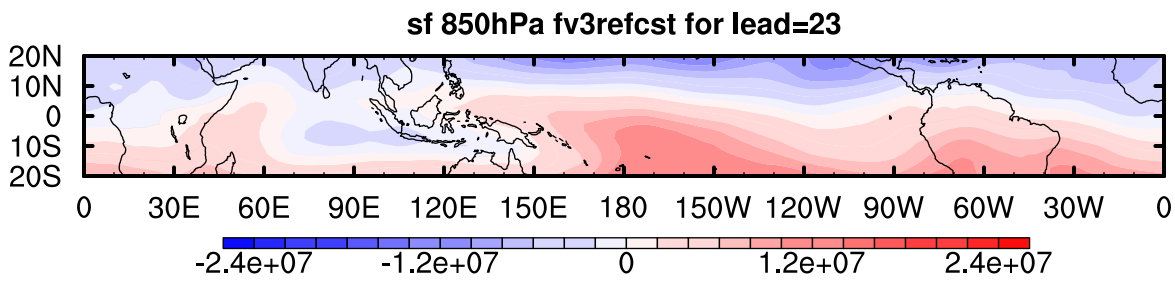
sf 850hPa fv3refcst for lead=23
20N
10N
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30E
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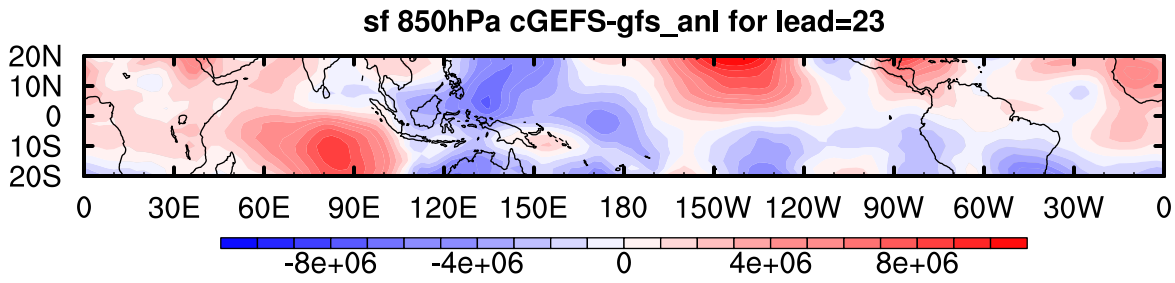
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=23
20N
10N
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10S
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90E
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30W
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-4e+06
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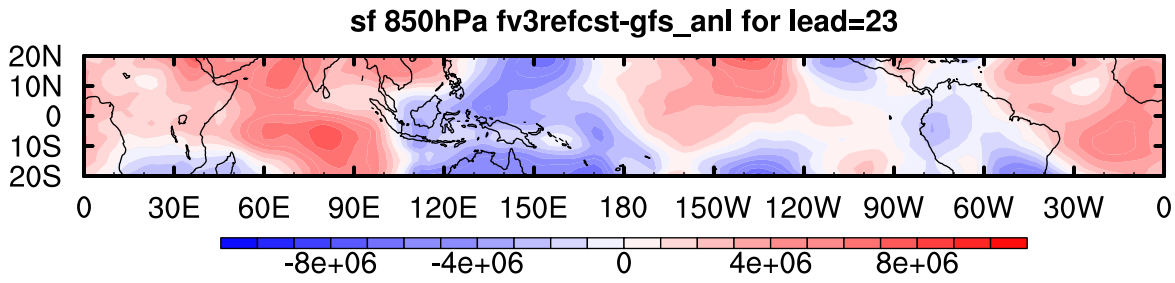
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=23
20N
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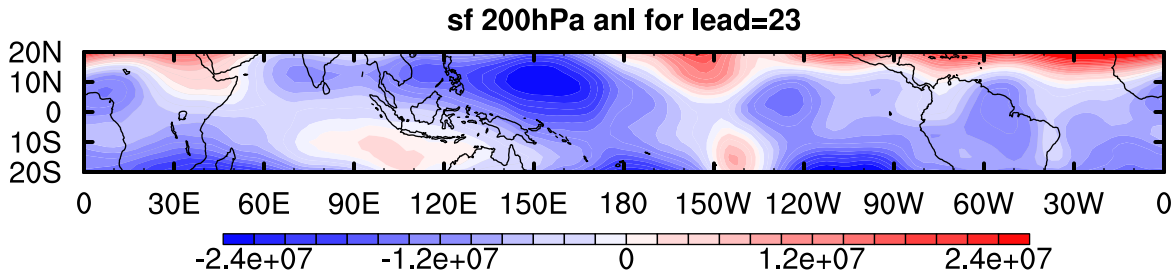
sf 200hPa anl for lead=23
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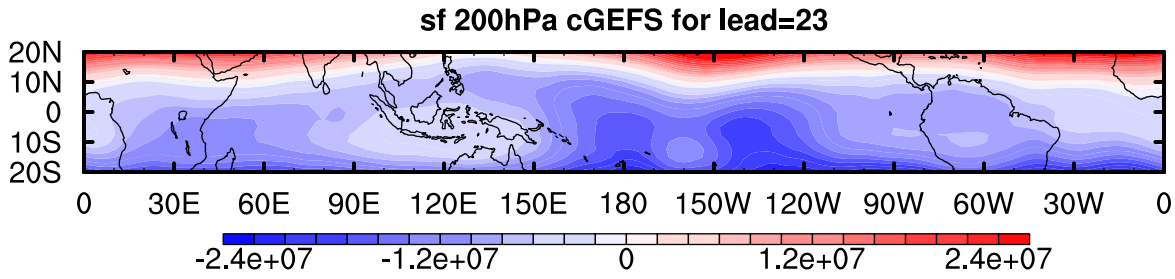
sf 200hPa cGEFS for lead=23
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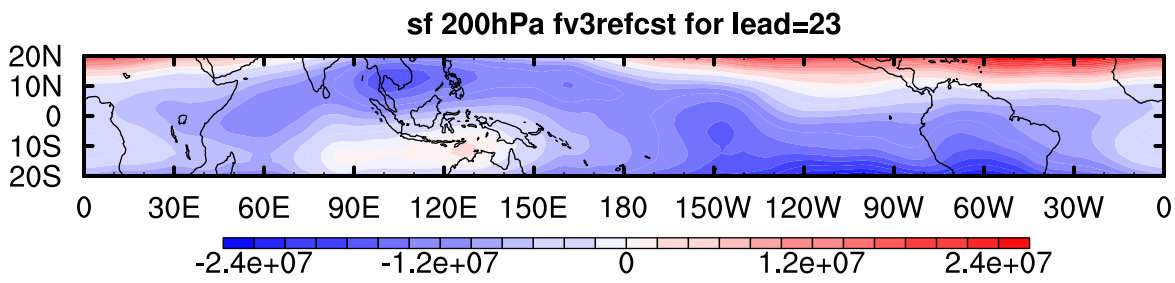
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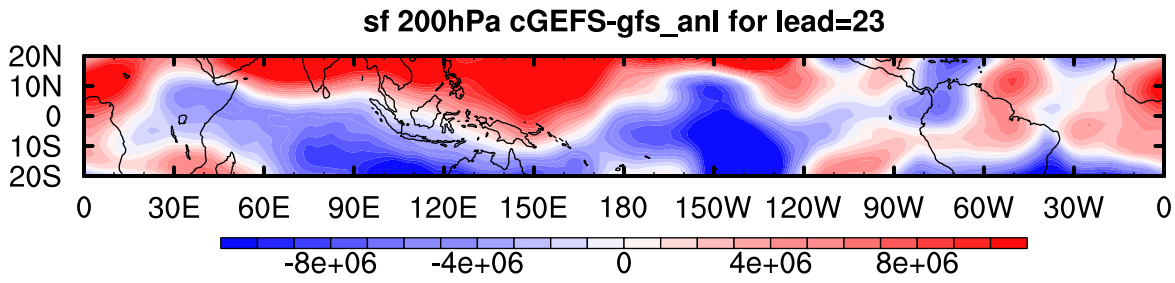
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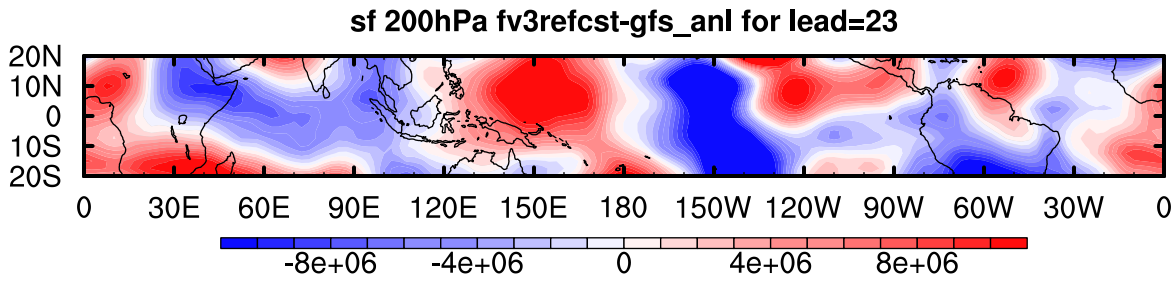
sf 200hPa fv3refcst-gfs_anl for lead=23
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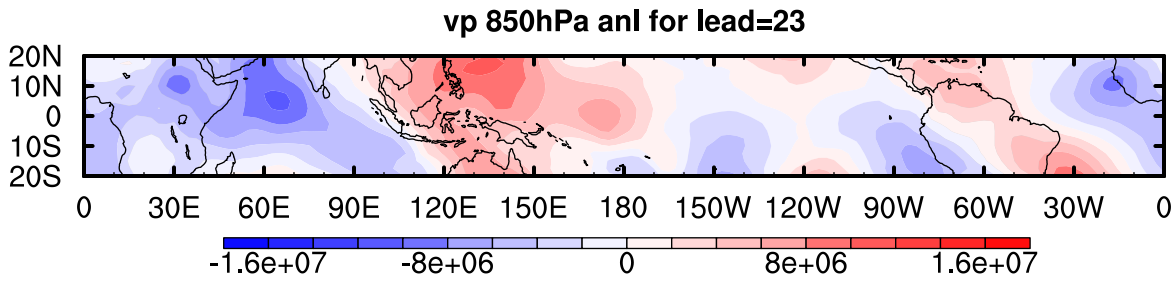
vp 850hPa anl for lead=23
20N
10N
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10S
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0
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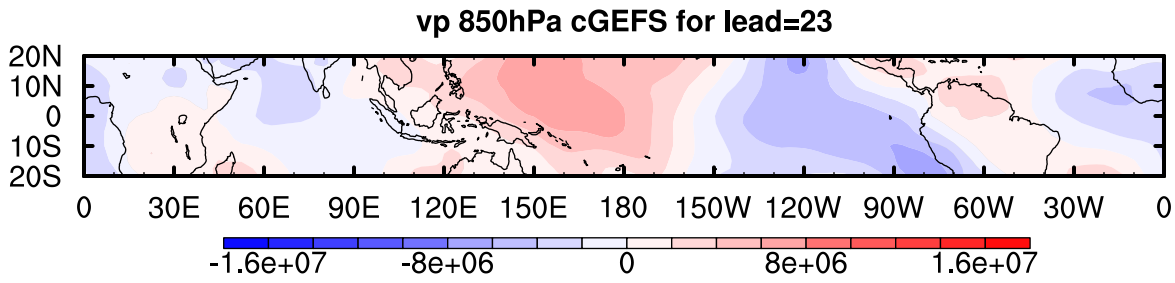
1.6e+07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-1.6e+07
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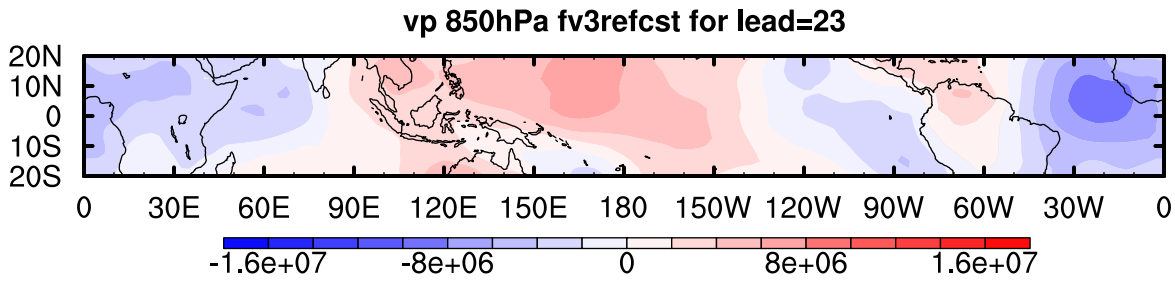
1.6e+07


vp 850hPa fv3refcst for lead=23
20N
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10S
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30E
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90E
120E
150E
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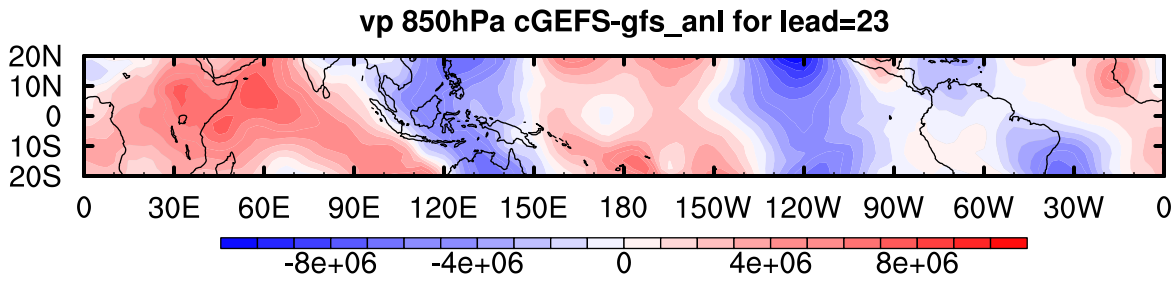
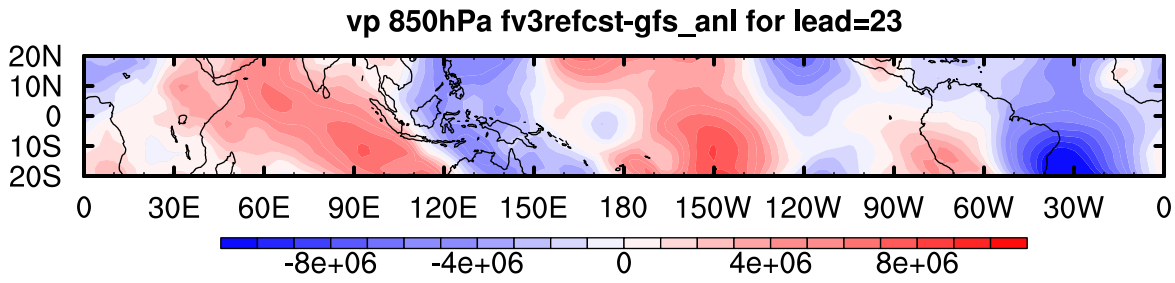
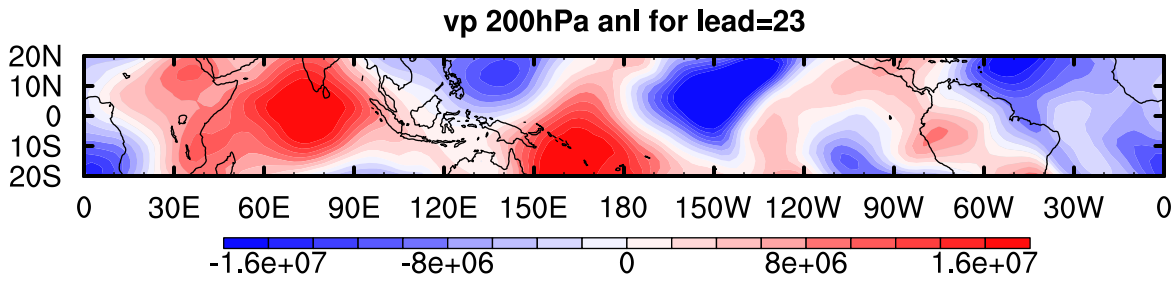
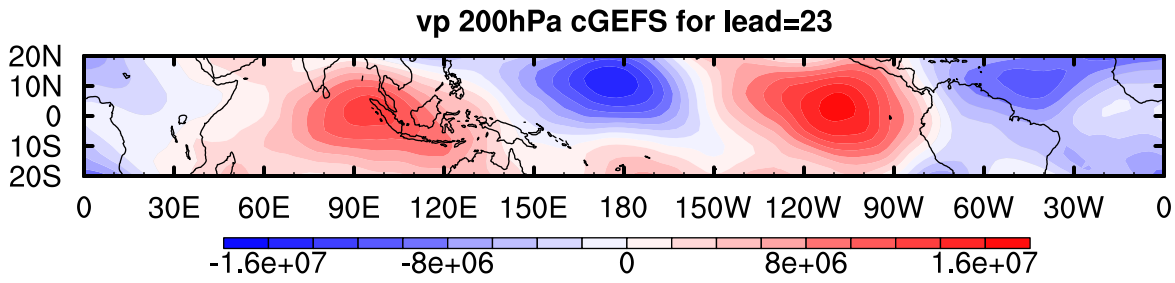
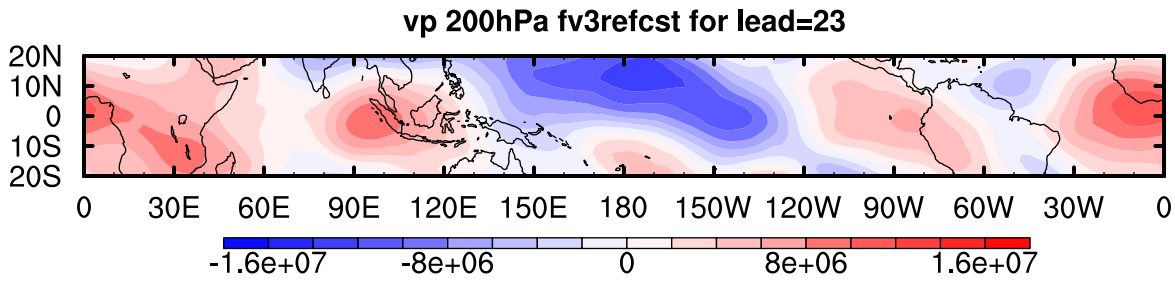
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

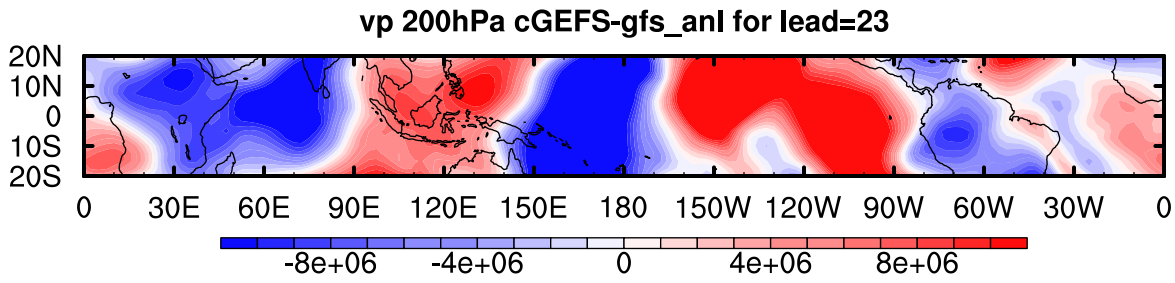

vp 850hPa cGEFS-gfs_anl for lead=23
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

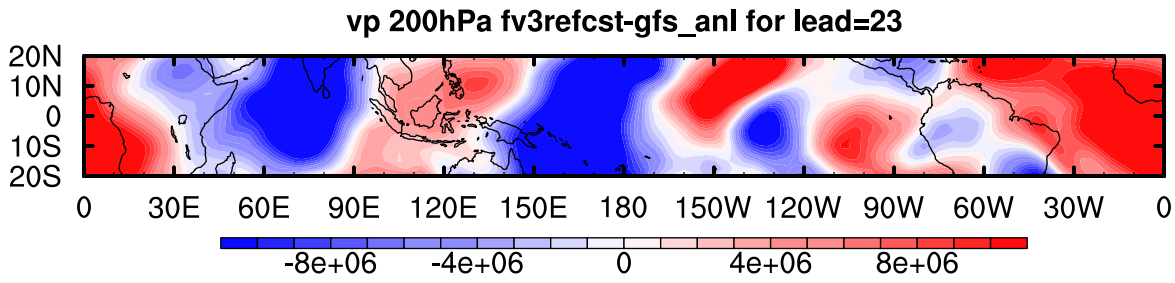

vp 850hPa fv3refcst-gfs_anl for lead=23
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

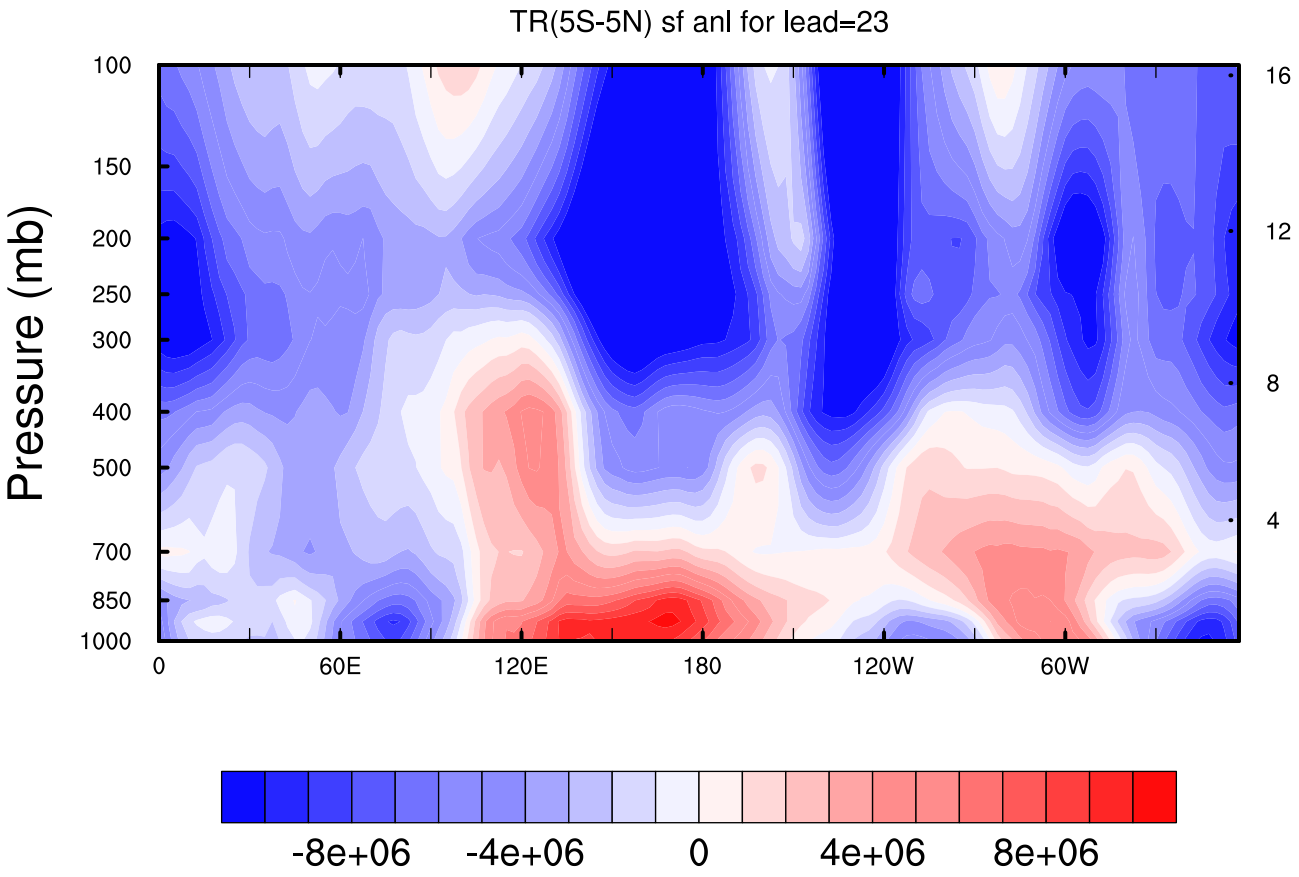

vp 200hPa anl for lead=23
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

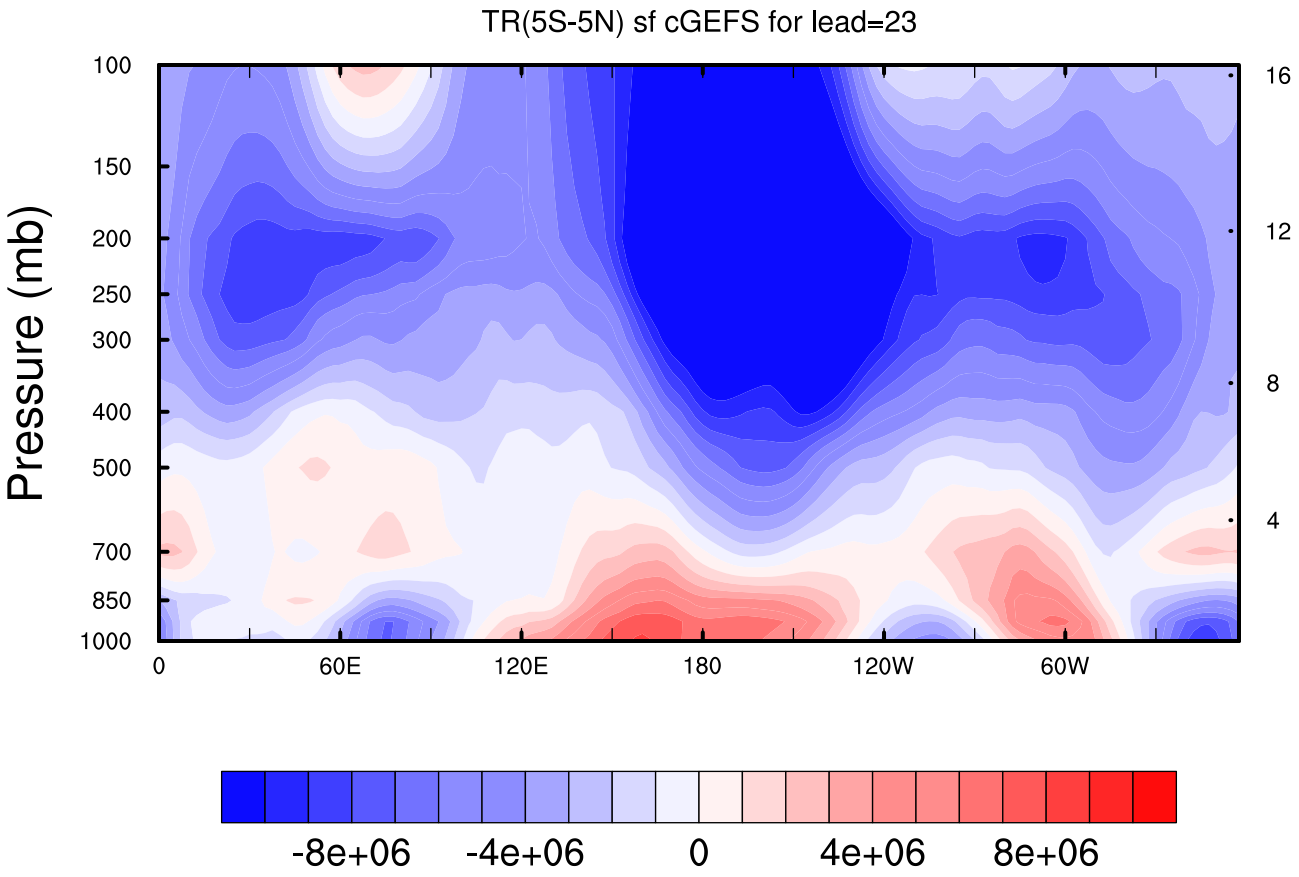

vp 200hPa cGEFS for lead=23
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

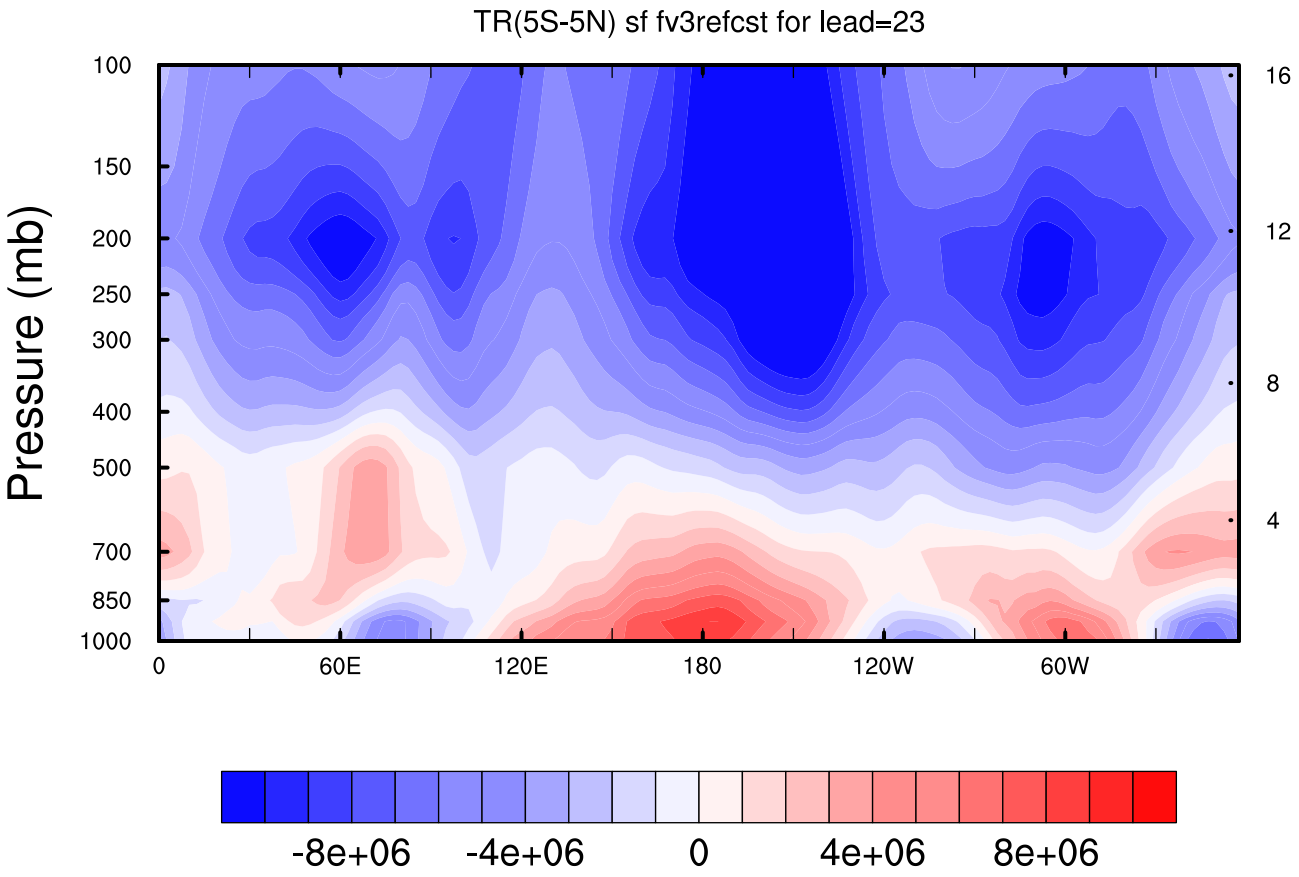

vp 200hPa fv3refcst for lead=23
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

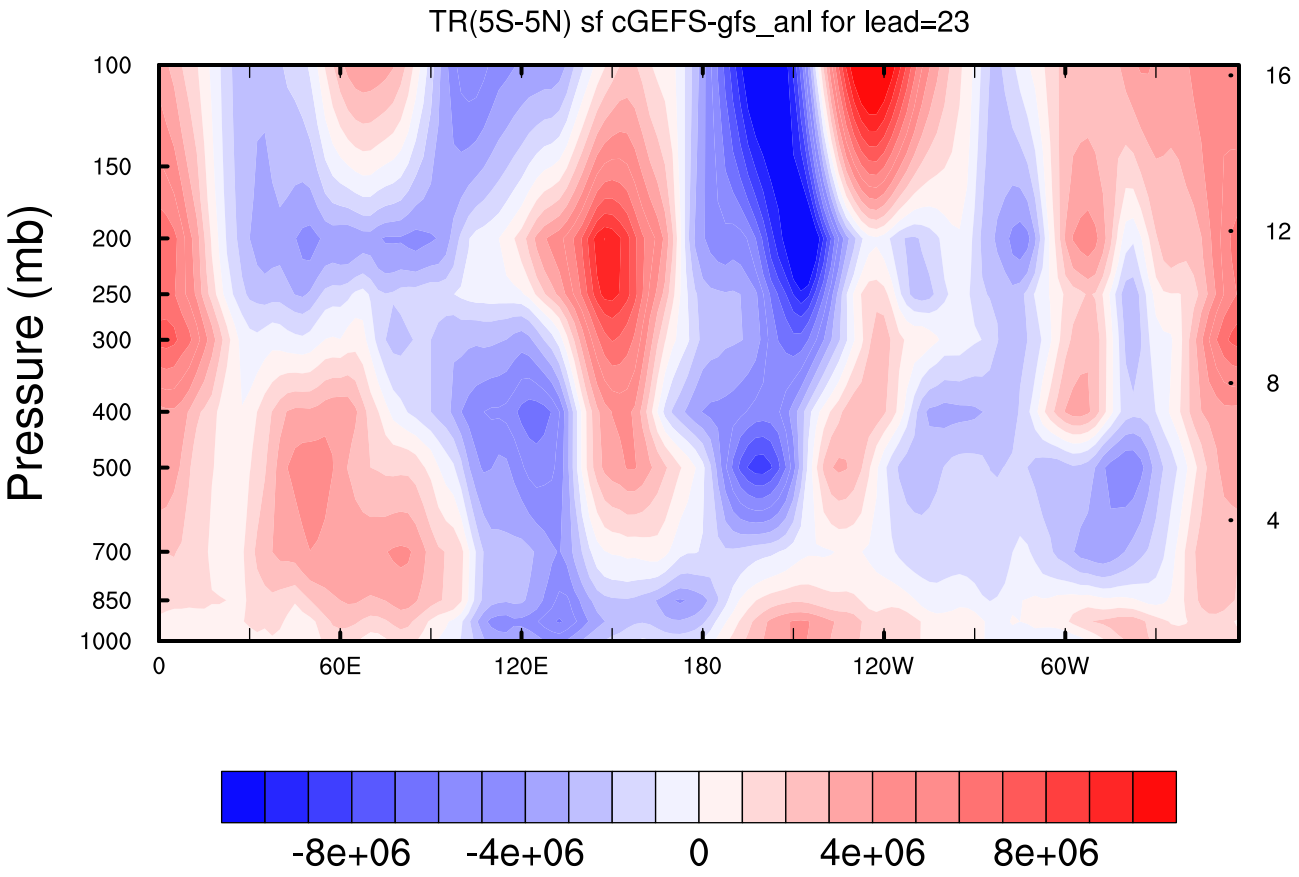

vp 200hPa cGEFS-gfs_anl for lead=23
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

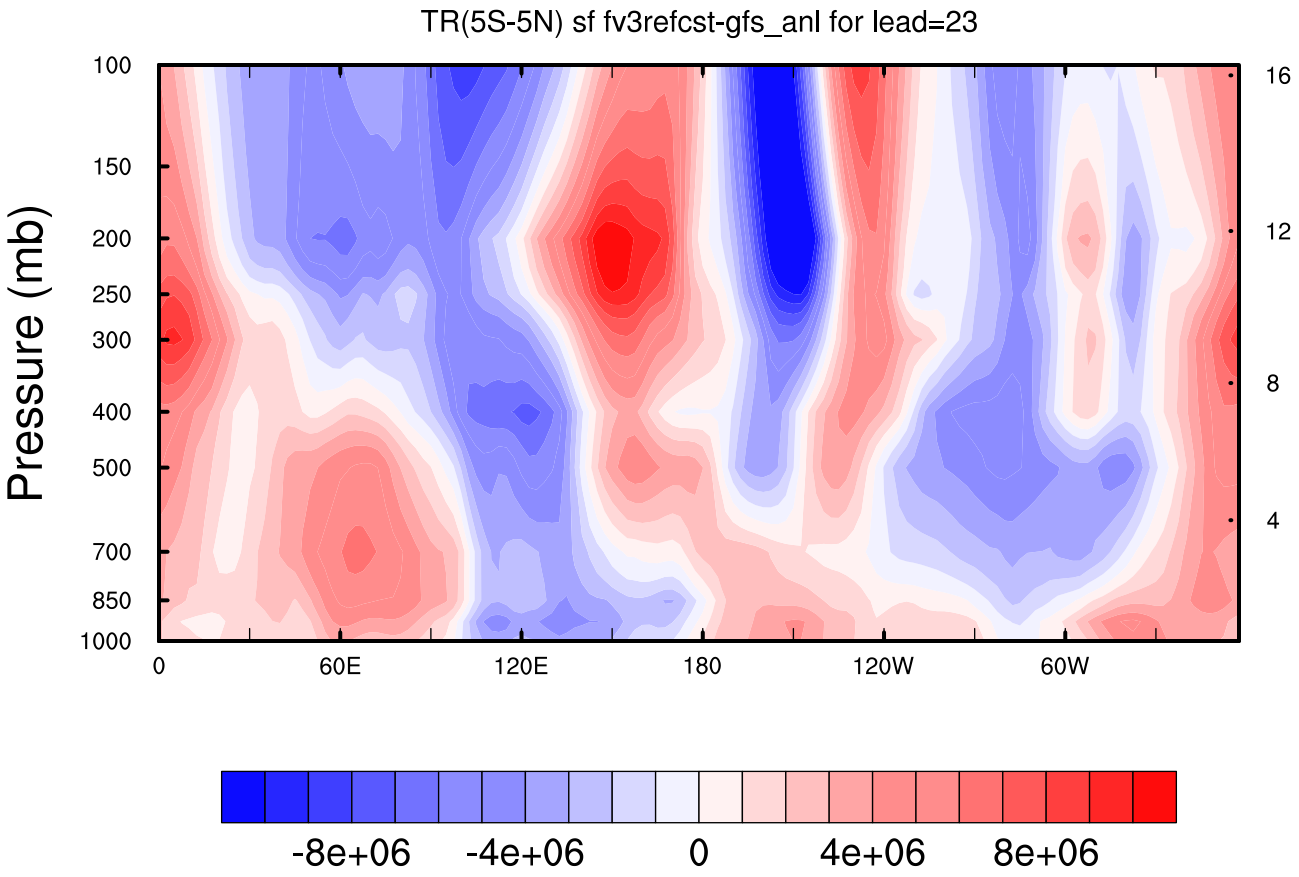

vp 200hPa fv3refcst-gfs_anl for lead=23
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

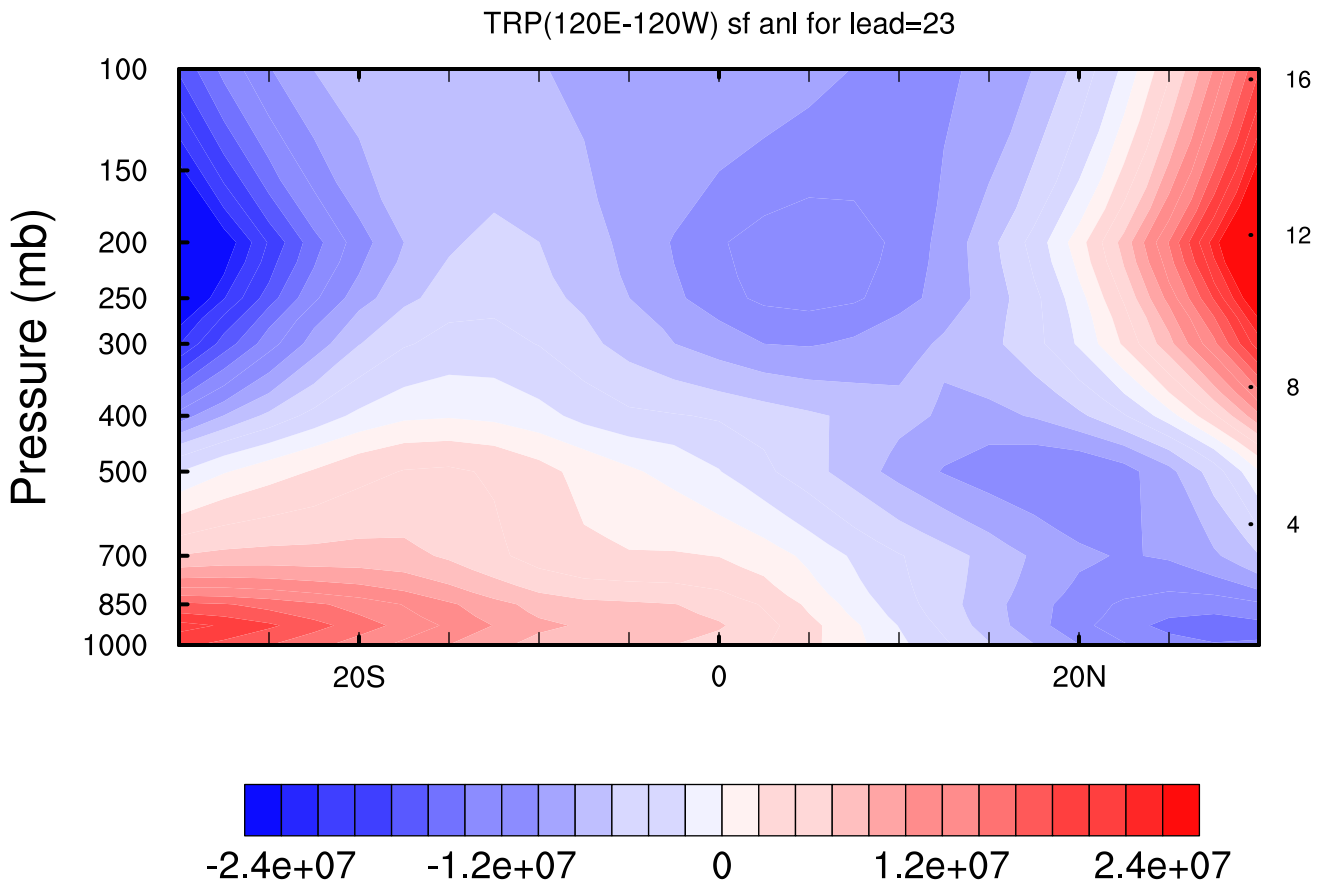

TR(5S-5N) sf anl for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

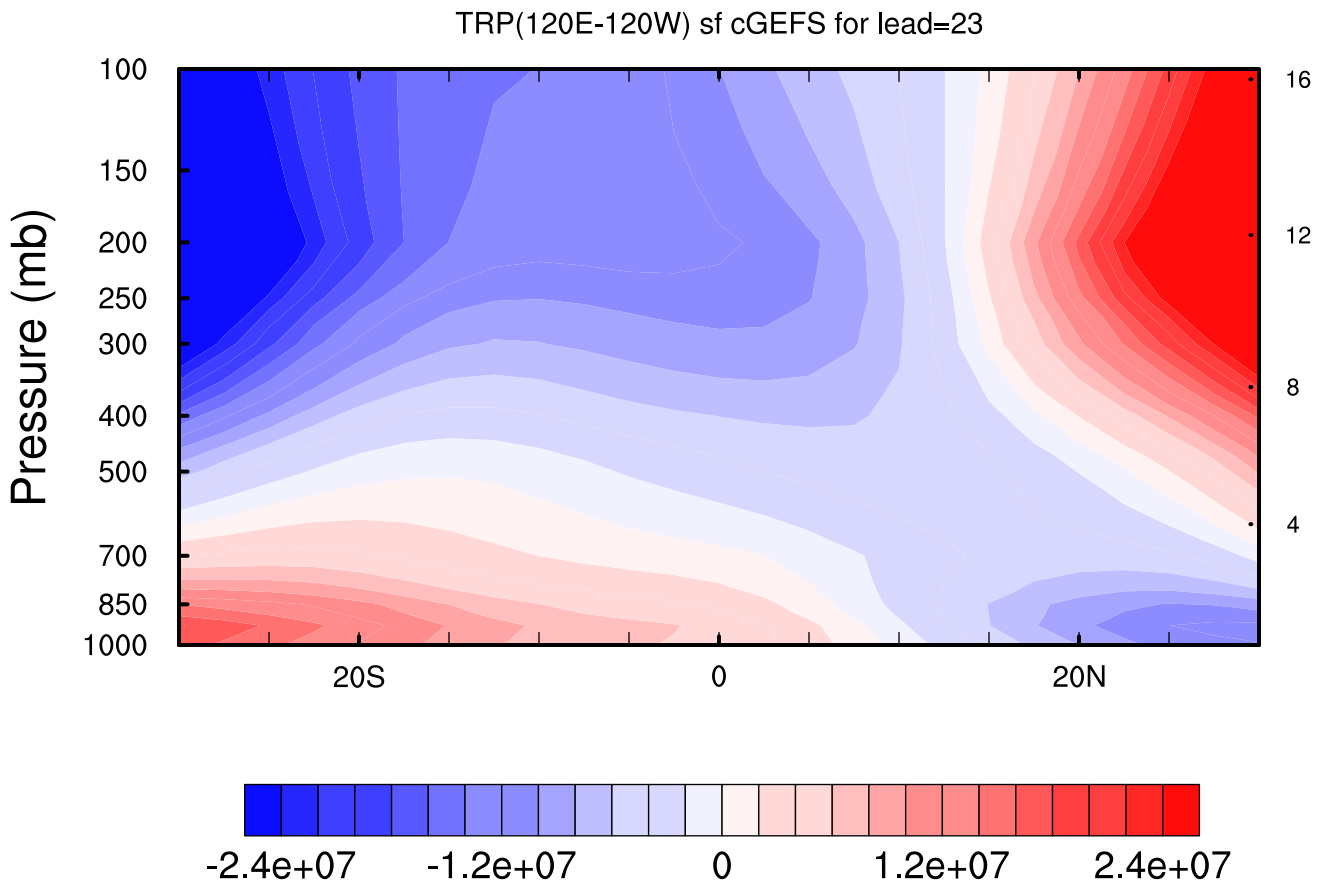

TR(5S-5N) sf cGEFS for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

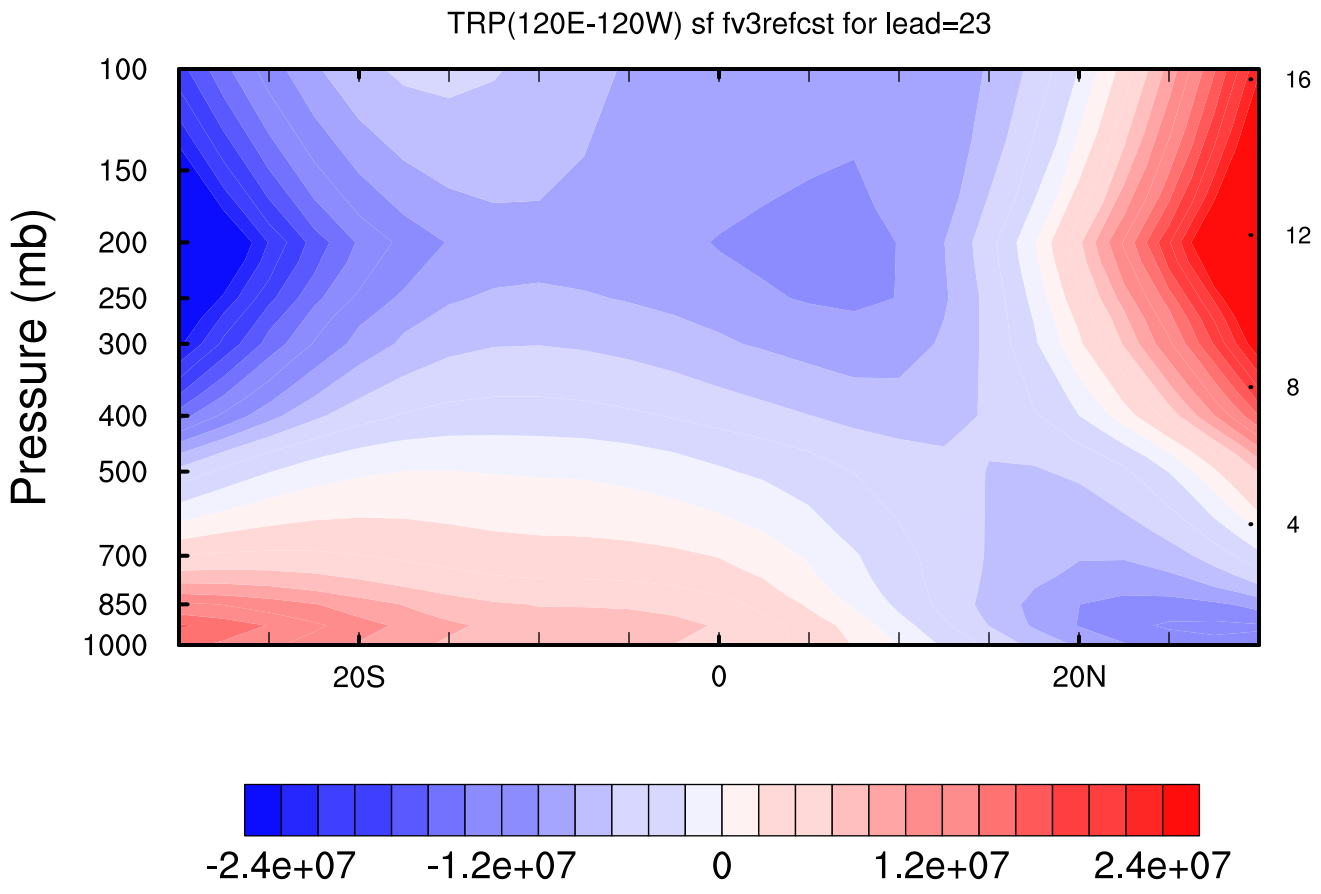

TR(5S-5N) sf fv3refcst for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

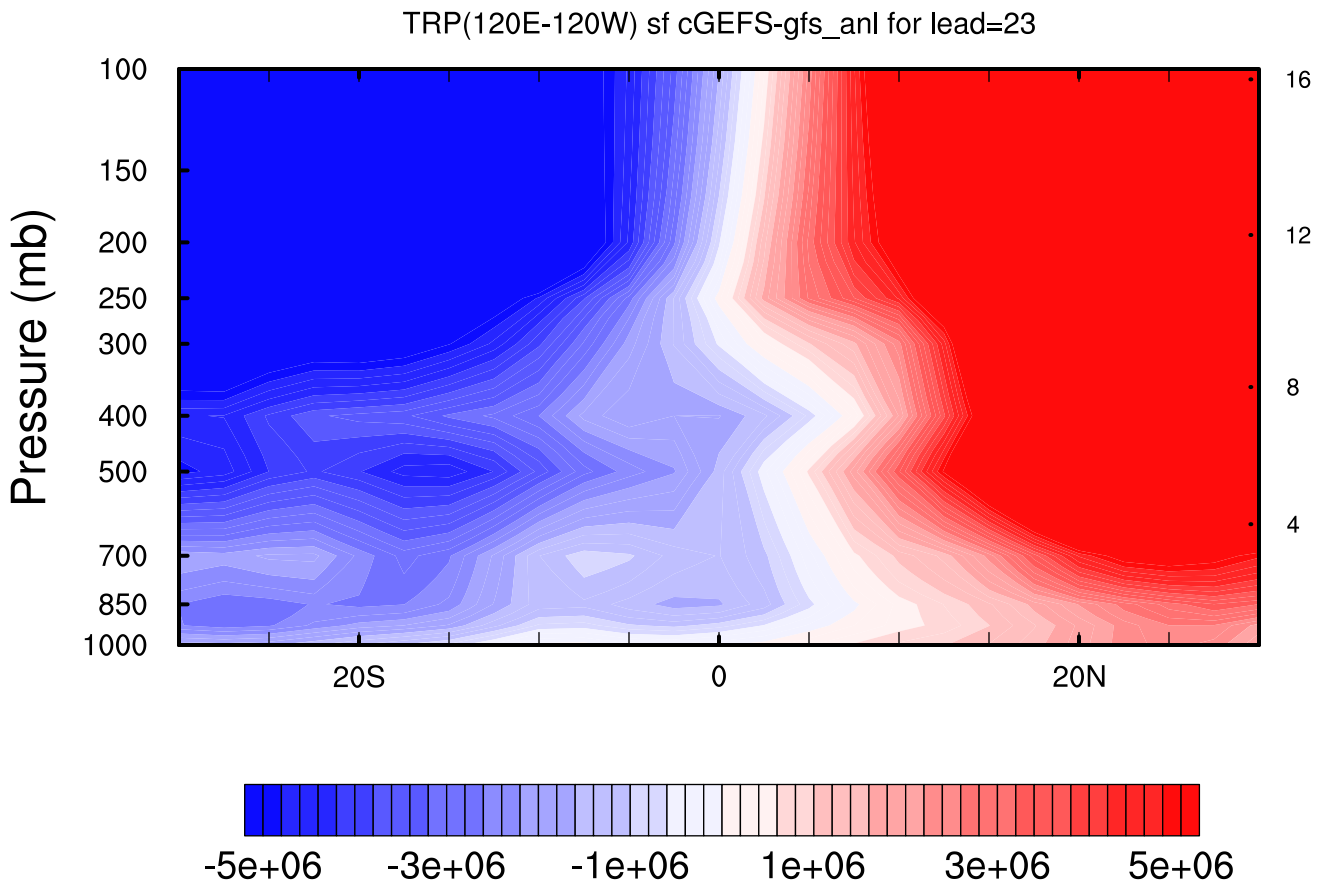

TR(5S-5N) sf cGEFS-gfs_anl for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

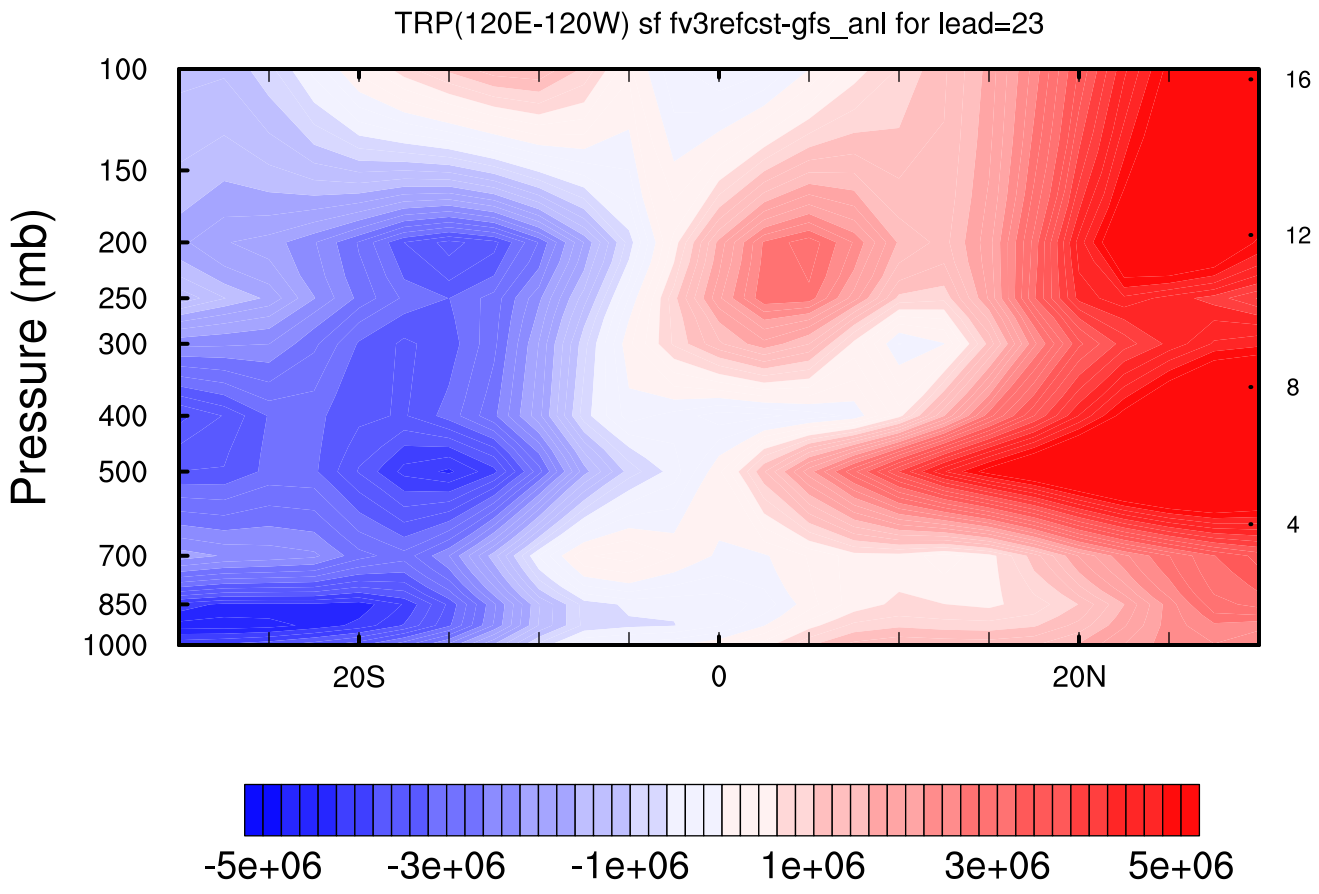

TR(5S-5N) sf fv3refcst-gfs_anl for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

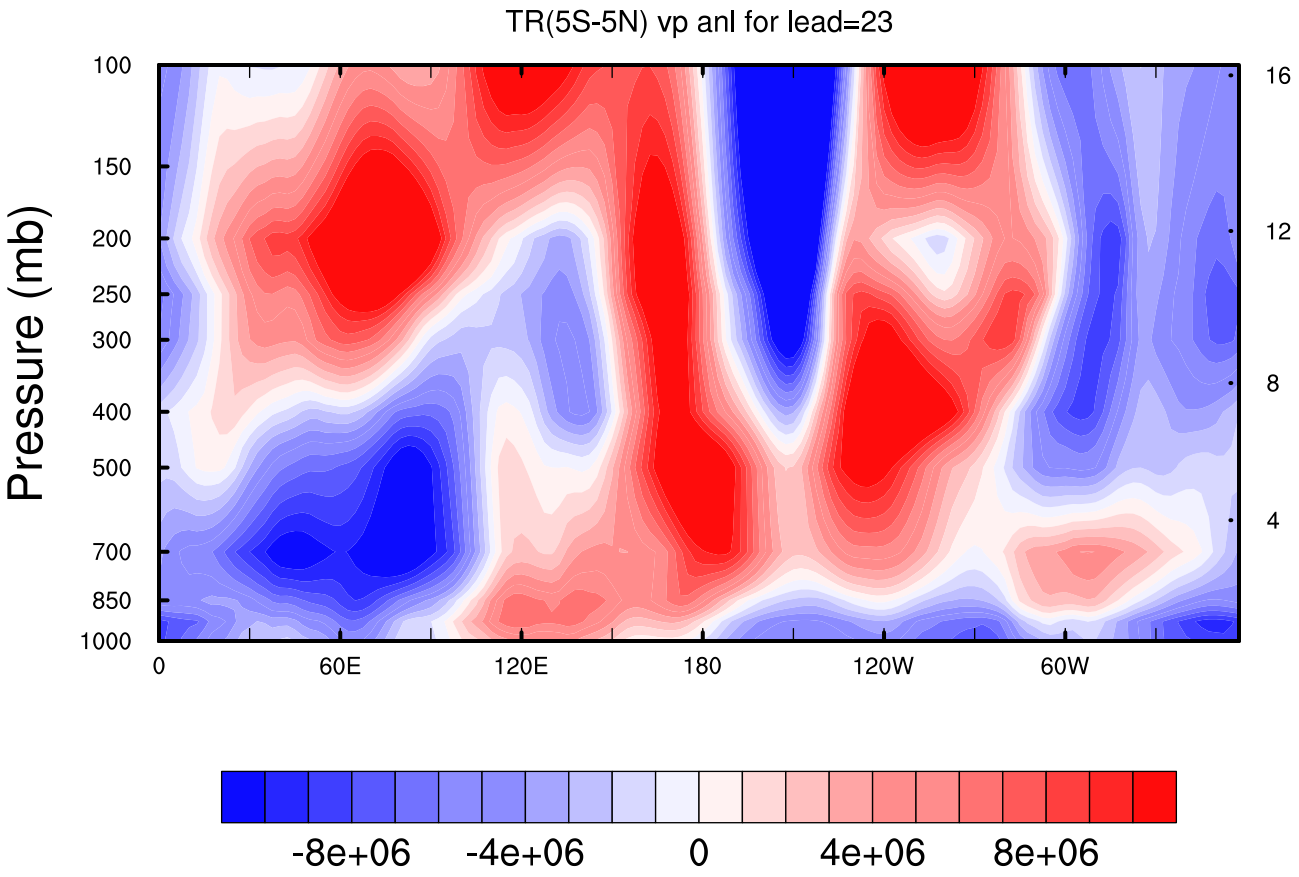

TRP(120E-120W) sf anl for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

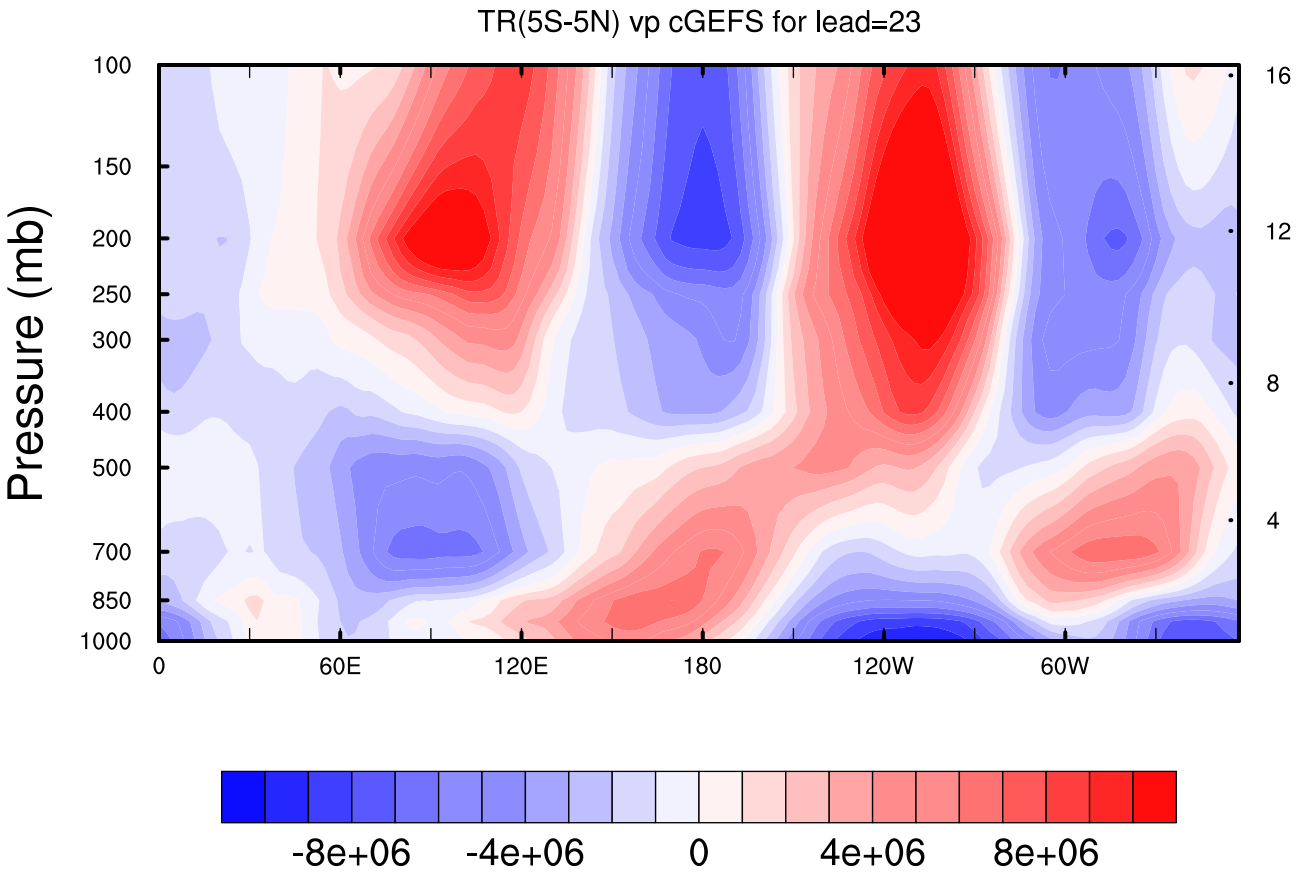

TRP(120E-120W) sf cGEFS for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

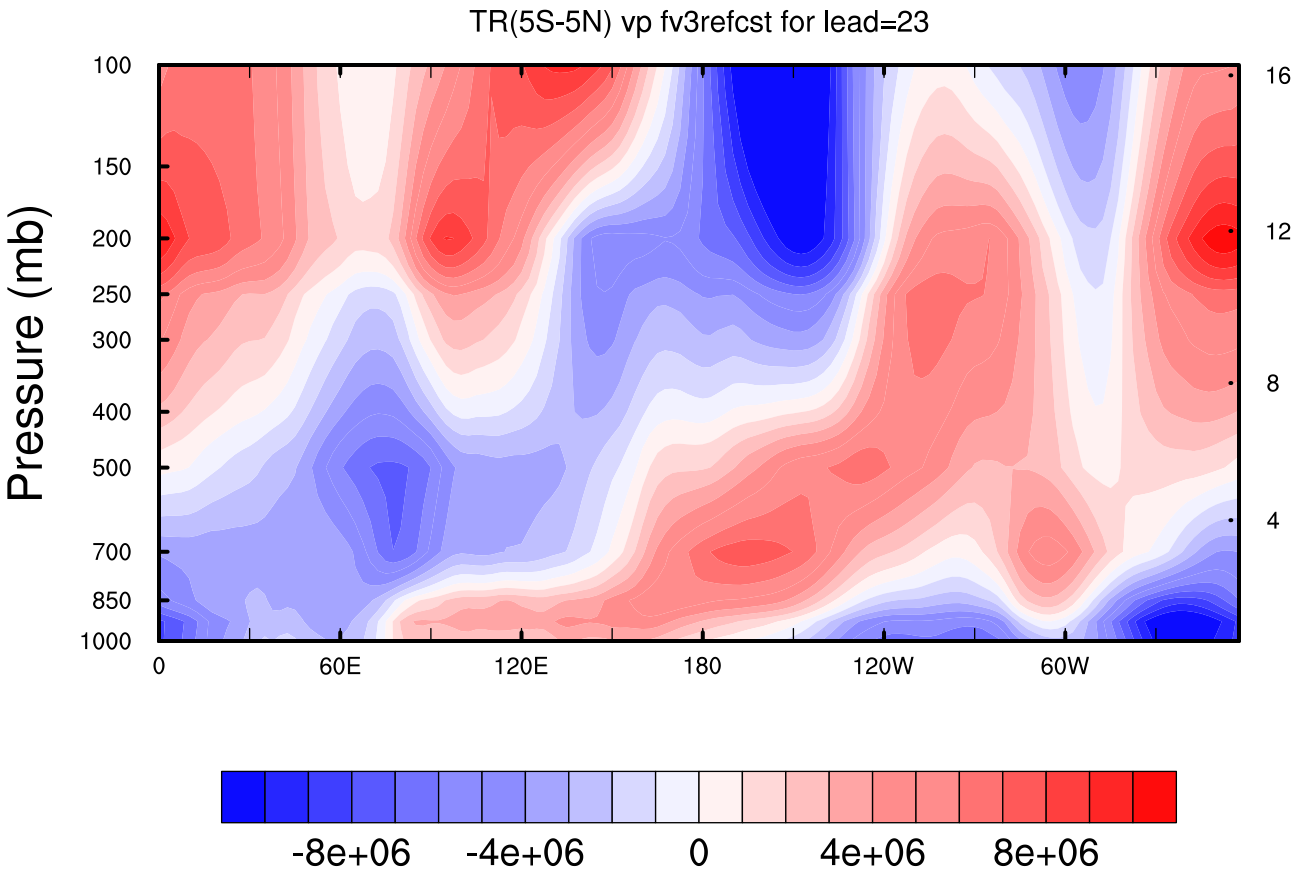

TRP(120E-120W) sf fv3refcst for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

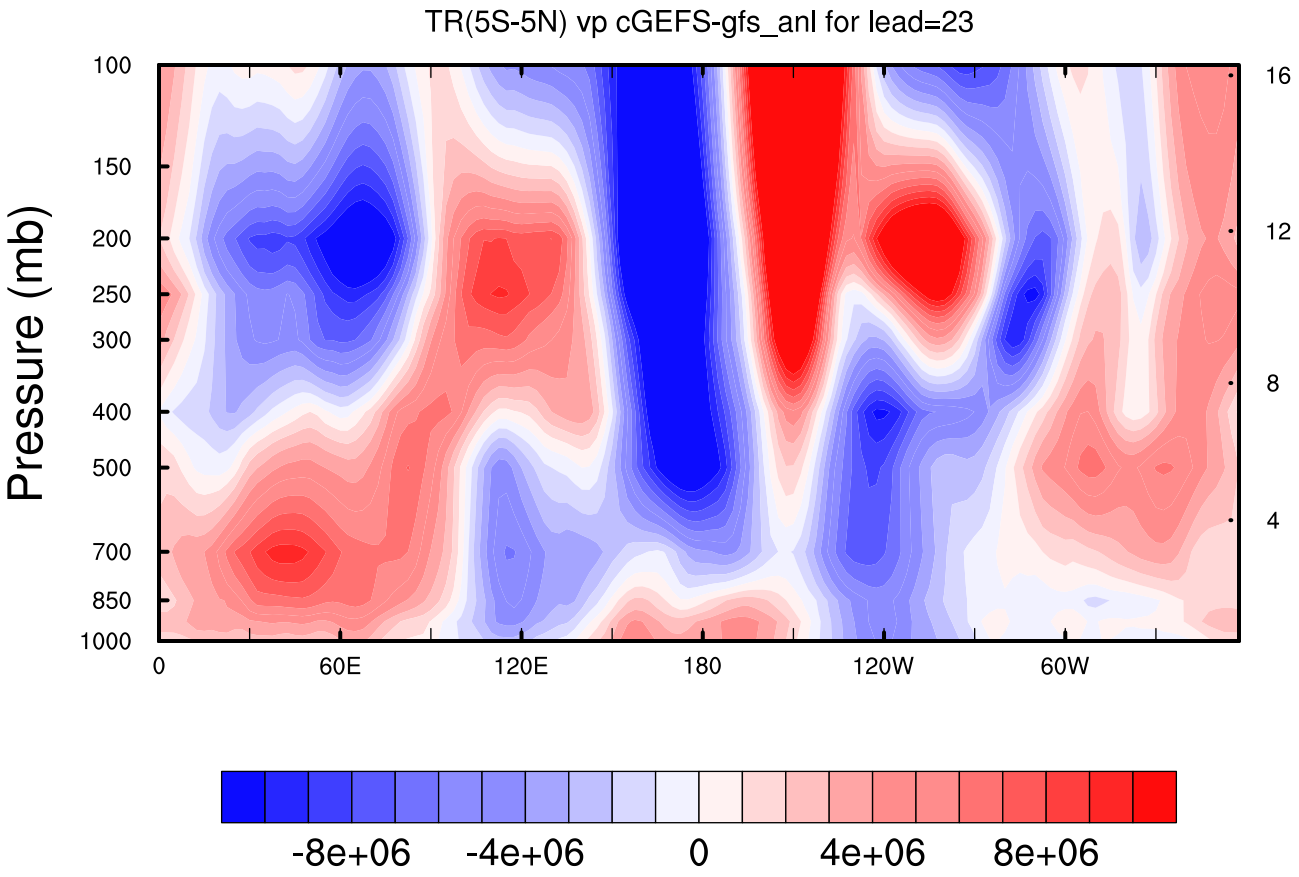

TRP(120E-120W) sf cGEFS-gfs_anl for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

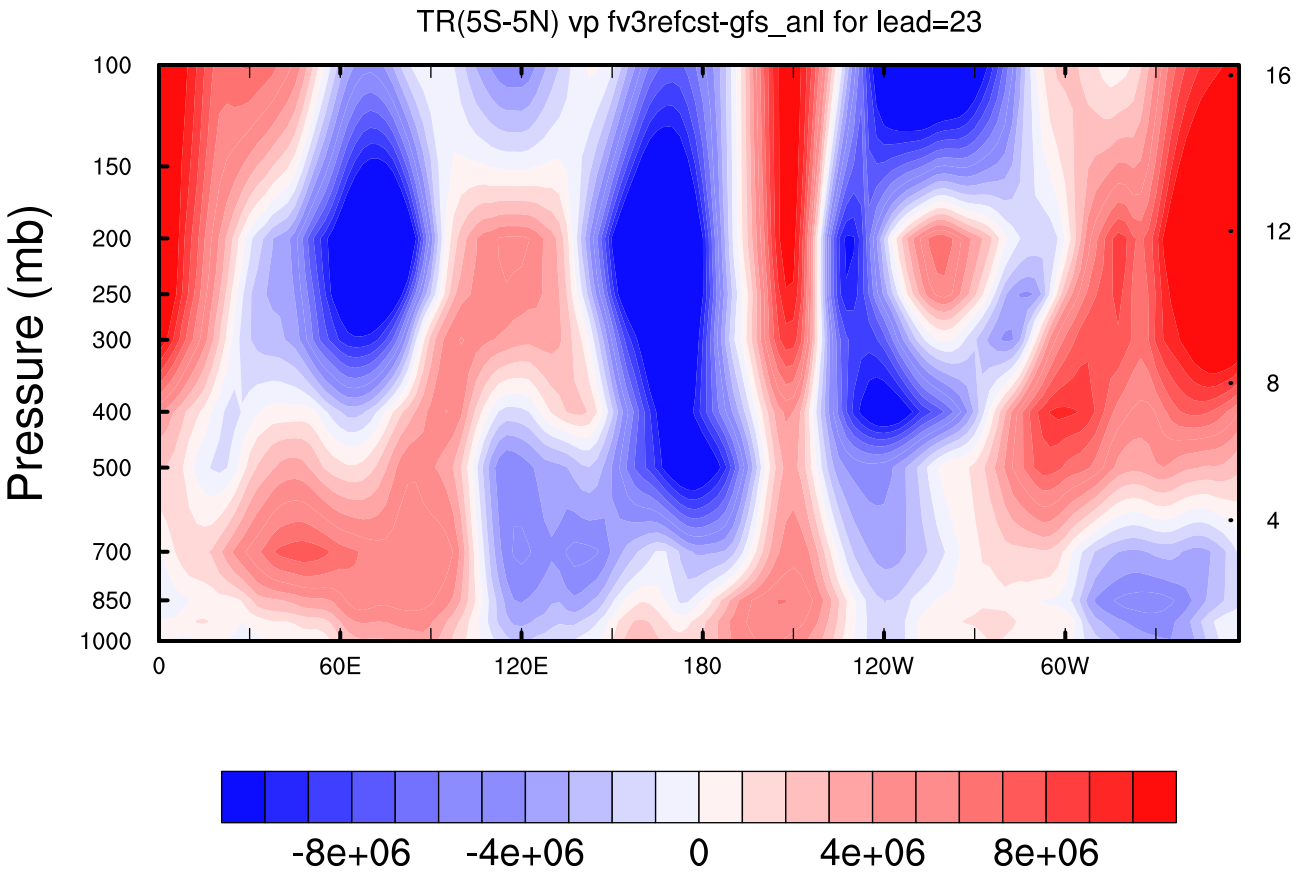

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

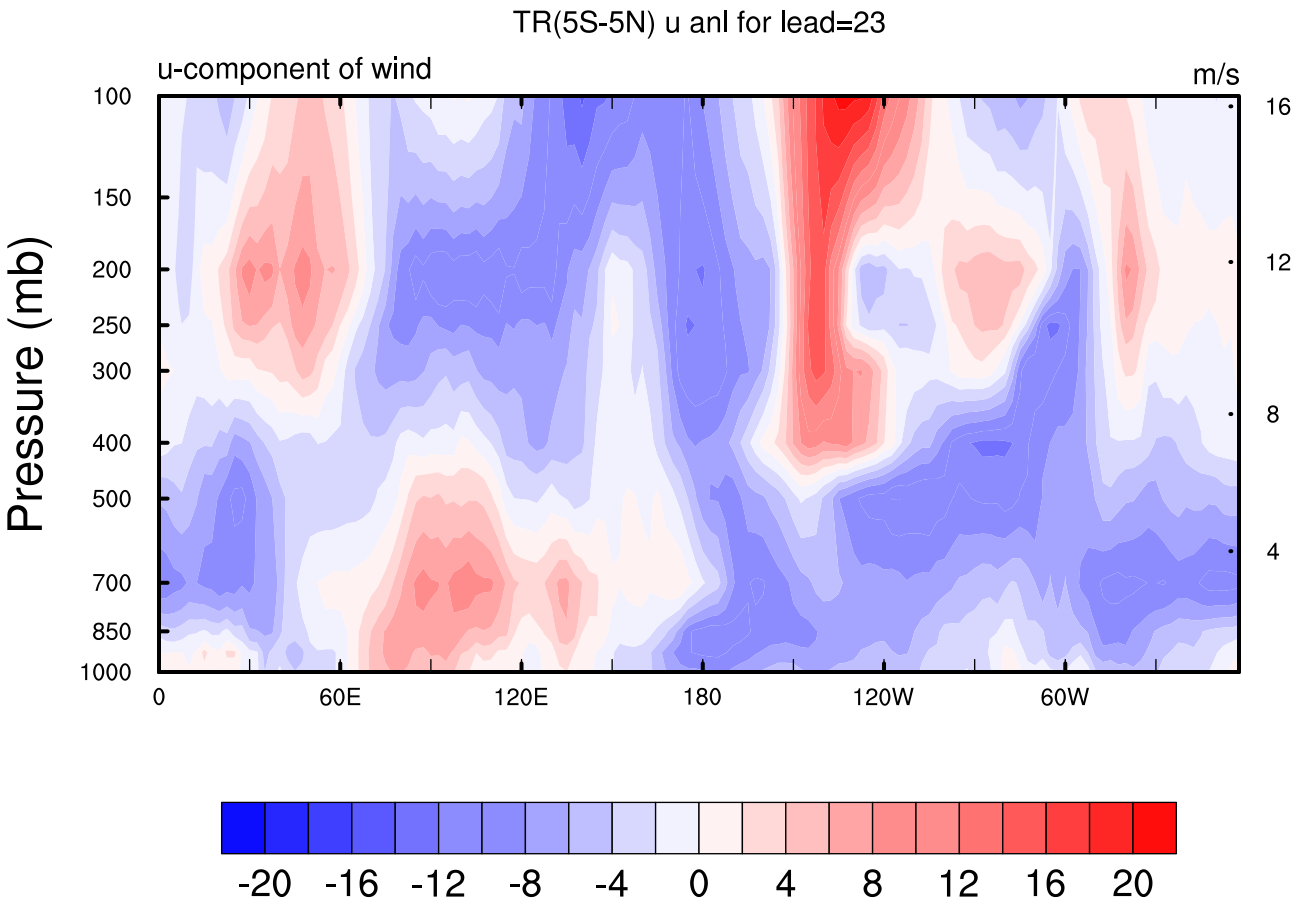

TR(5S-5N) vp anl for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

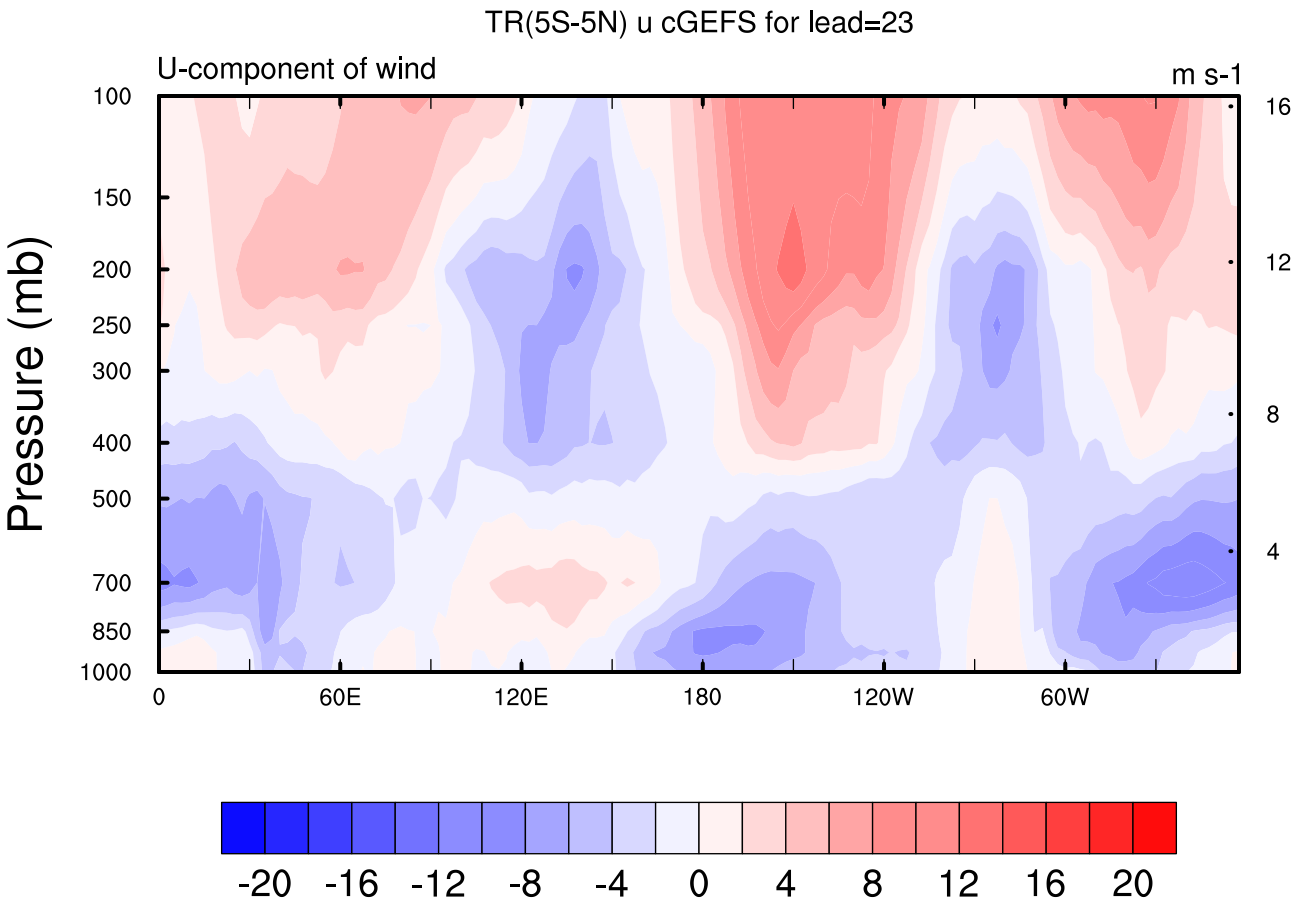

TR(5S-5N) vp cGEFS for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

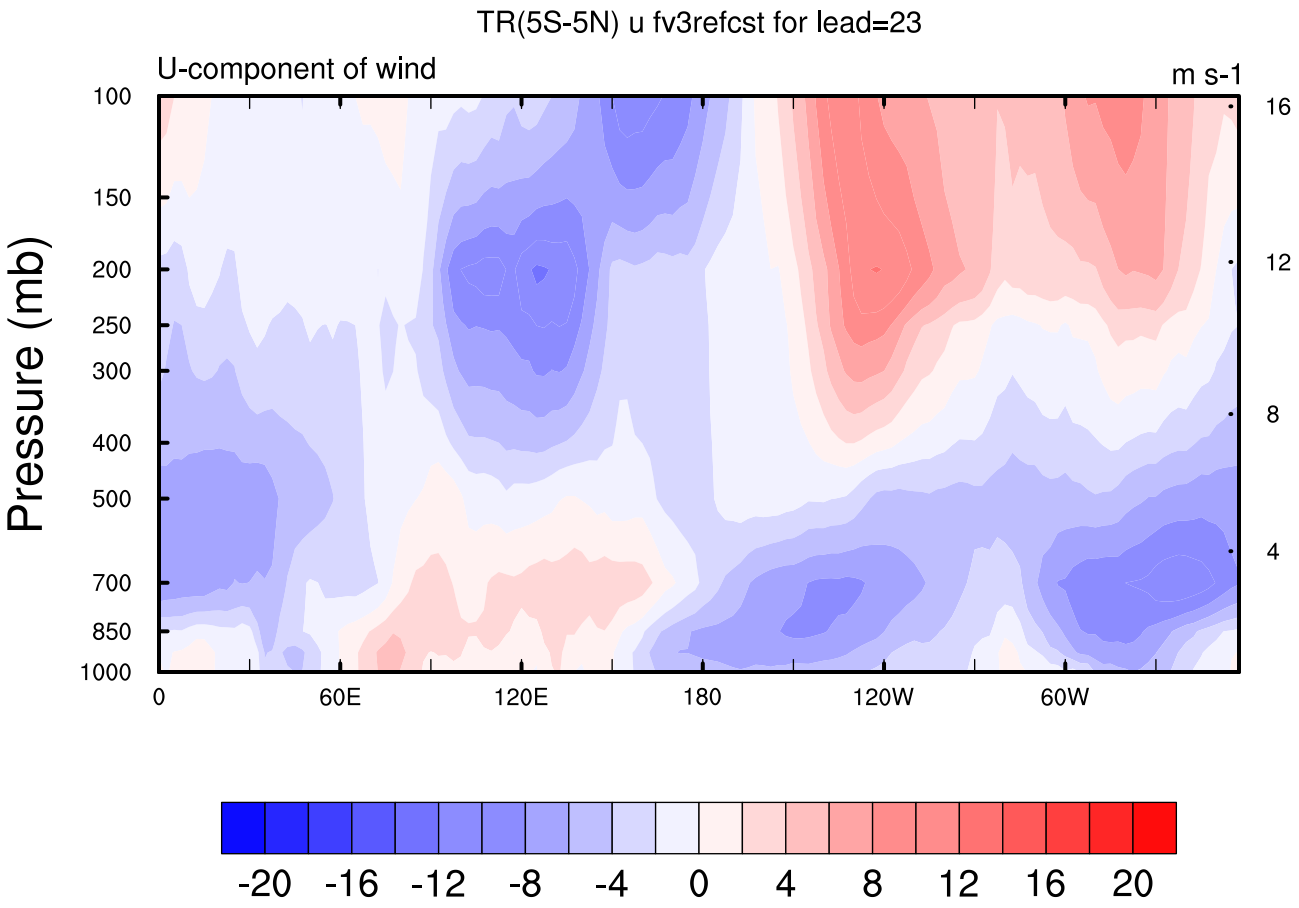

TR(5S-5N) vp fv3refcst for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

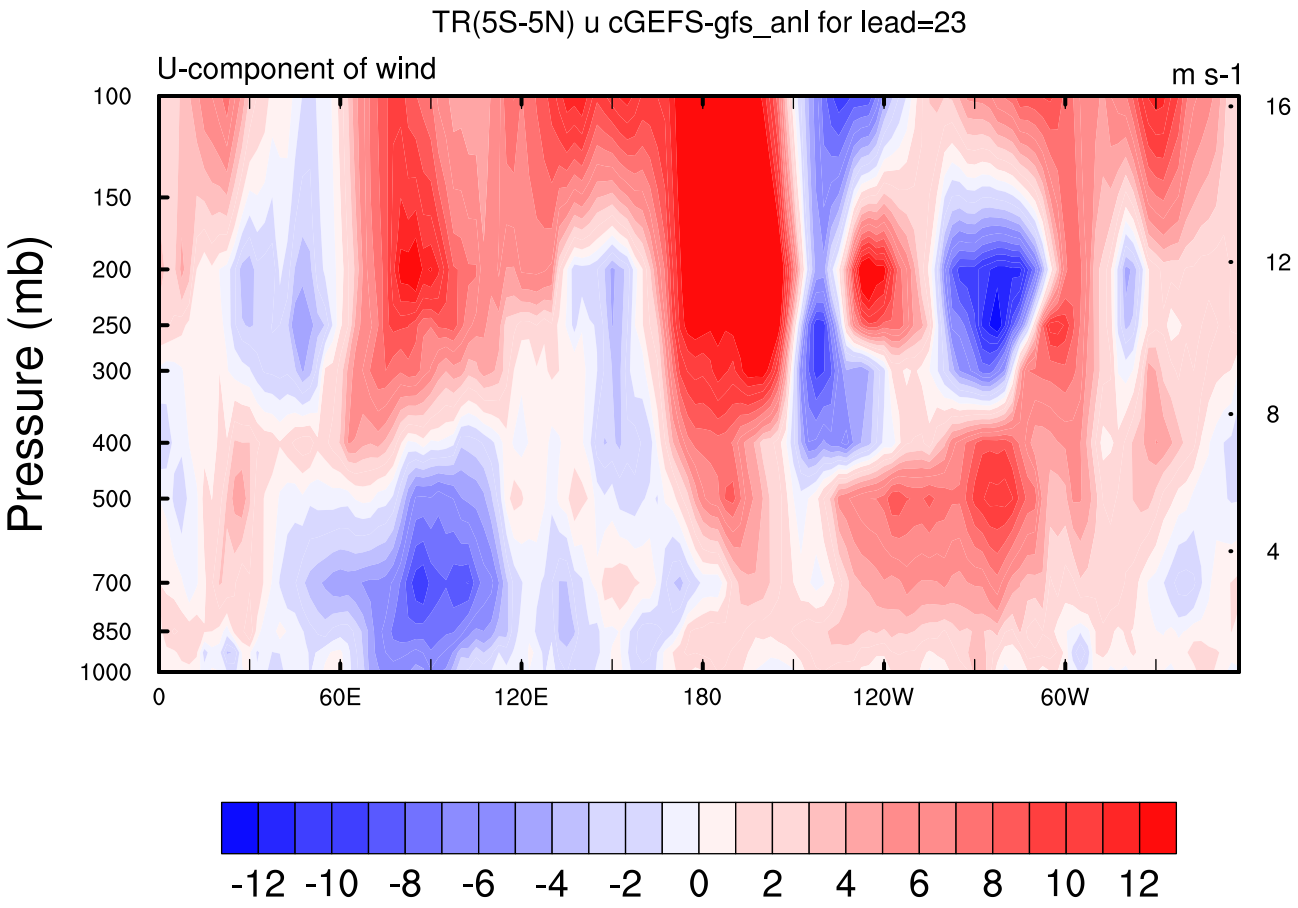

TR(5S-5N) vp cGEFS-gfs_anl for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

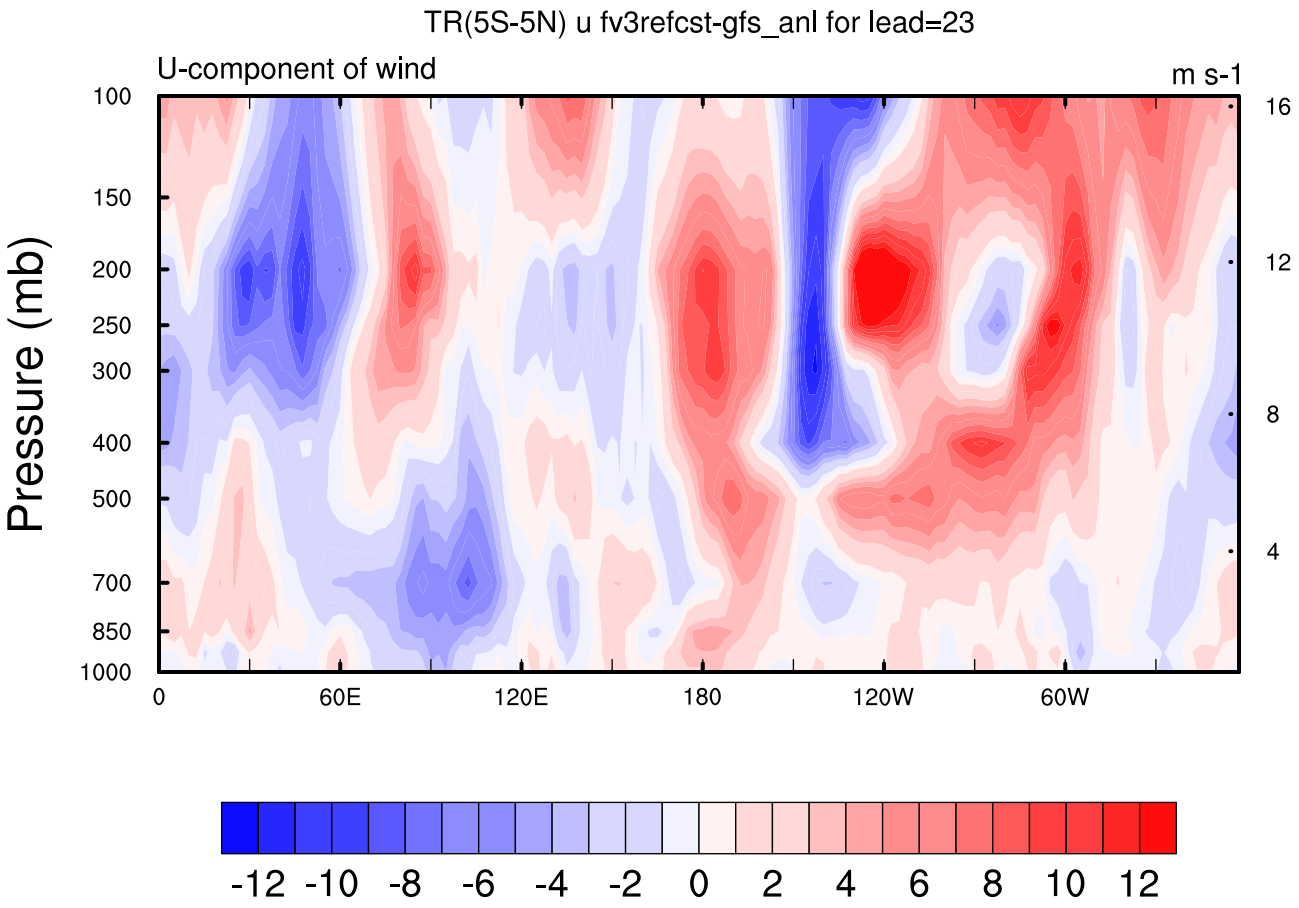

TR(5S-5N) vp fv3refcst-gfs_anl for lead=23
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

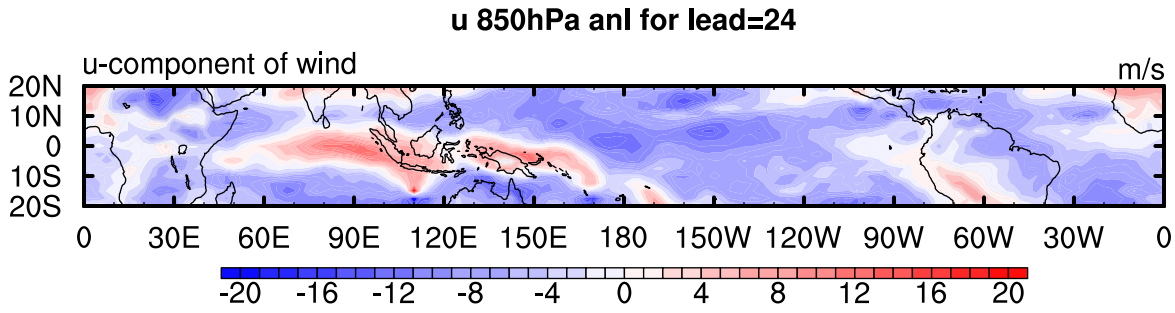

TR(5S-5N) u anl for lead=23
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

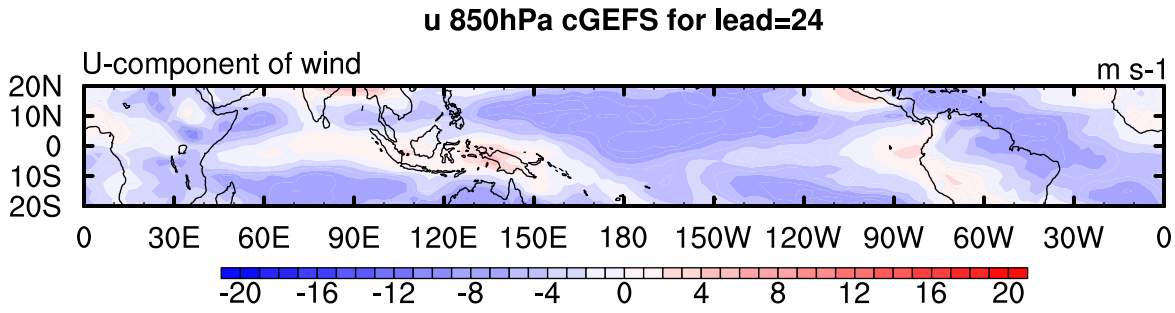

TR(5S-5N) u cGEFS for lead=23
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

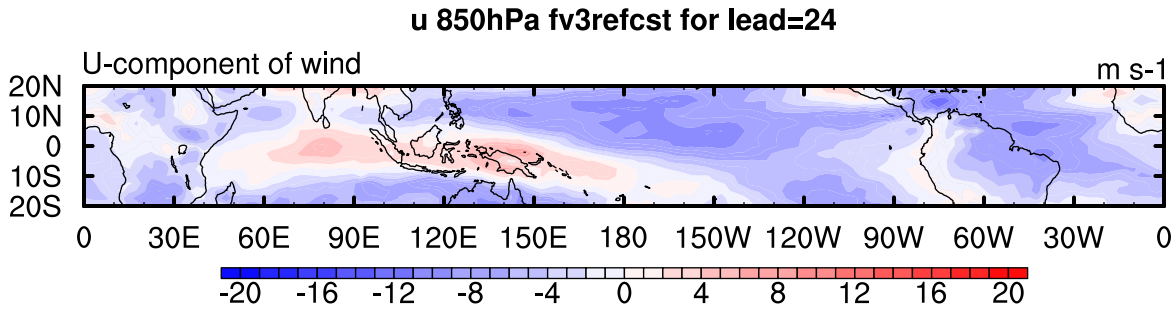

TR(5S-5N) u fv3refcst for lead=23
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

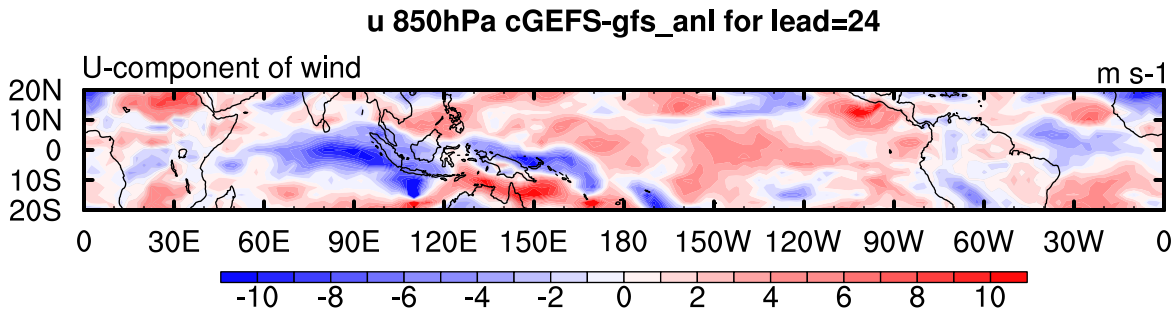

TR(5S-5N) u cGEFS-gfs_anl for lead=23
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

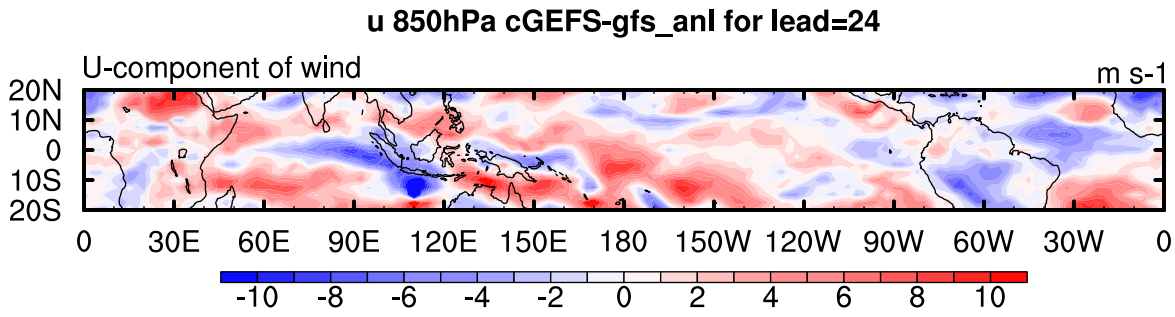

TR(5S-5N) u fv3refcst-gfs_anl for lead=23
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

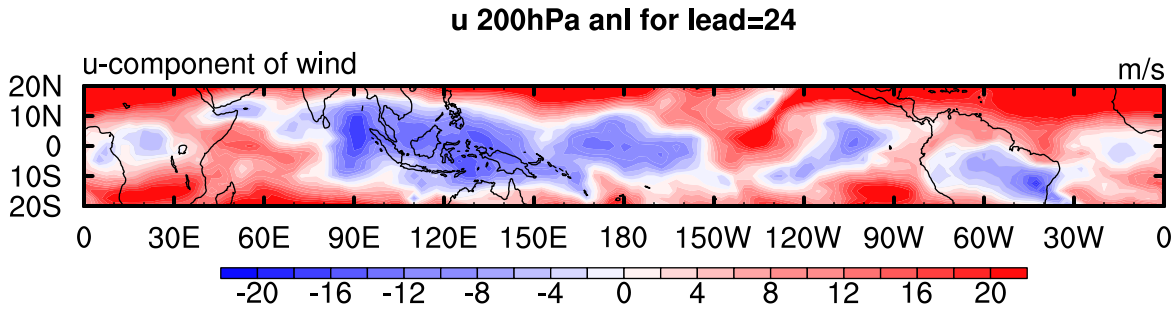

u 850hPa anl for lead=24
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

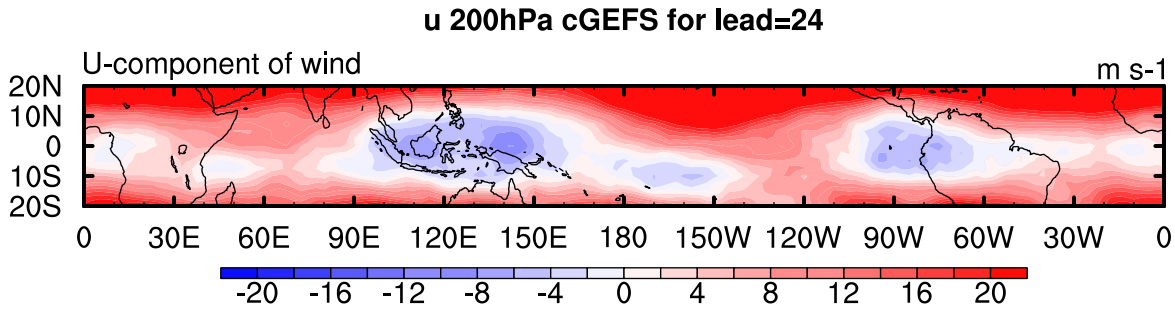

u 850hPa cGEFS for lead=24
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

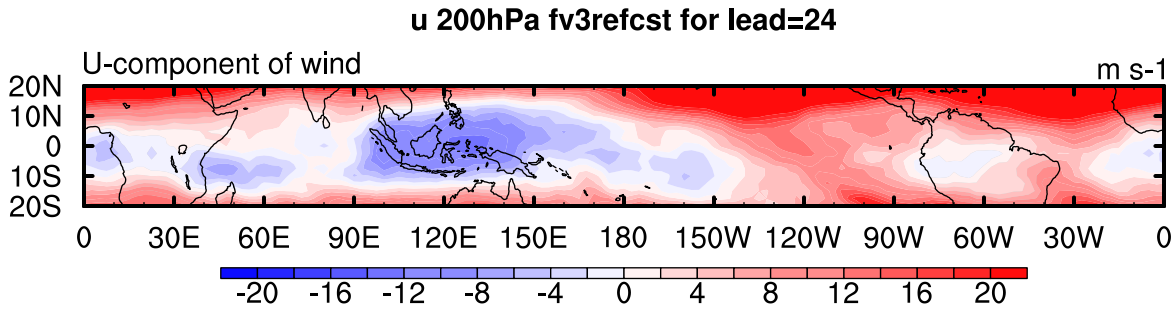

u 850hPa fv3refcst for lead=24
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

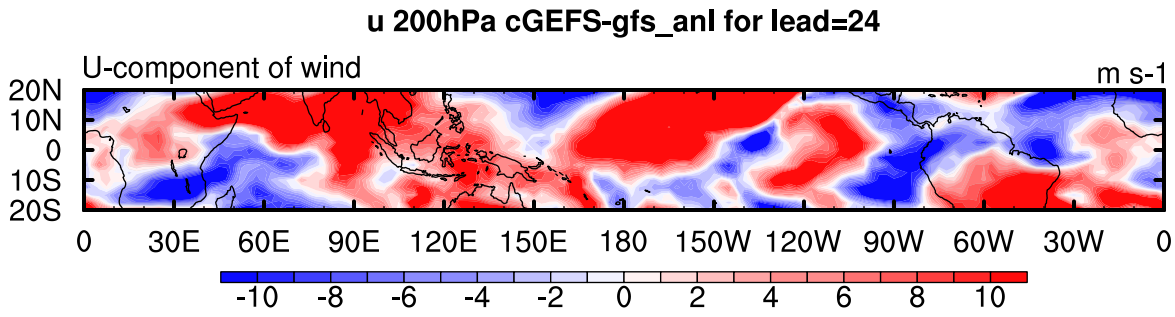

u 850hPa cGEFS-gfs_anl for lead=24
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

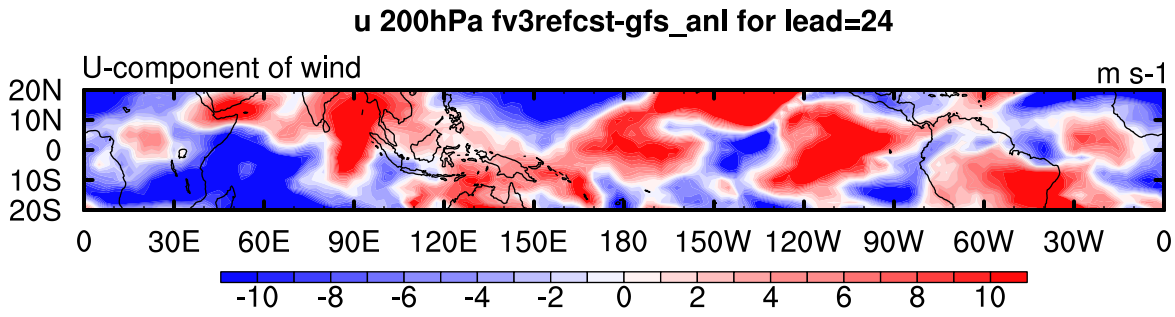

u 850hPa cGEFS-gfs_anl for lead=24
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

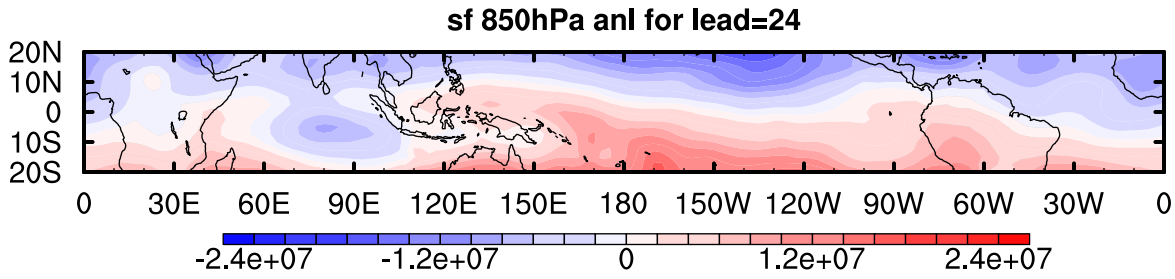

u 200hPa anl for lead=24
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

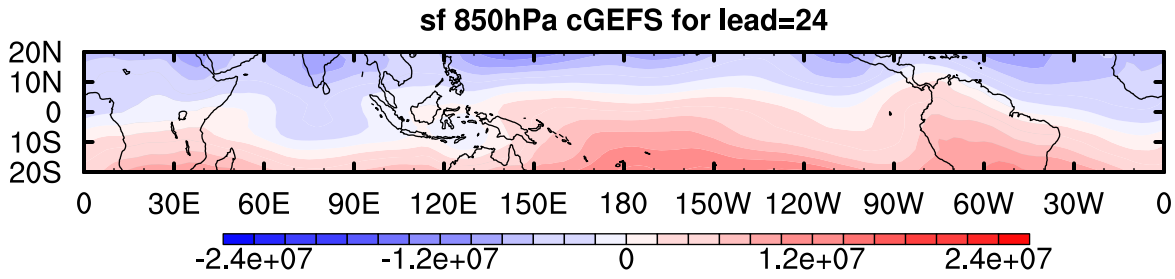

u 200hPa cGEFS for lead=24
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

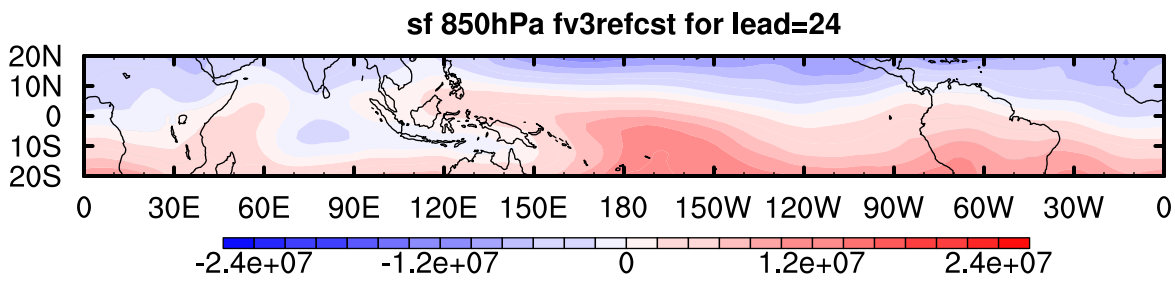

u 200hPa fv3refcst for lead=24
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

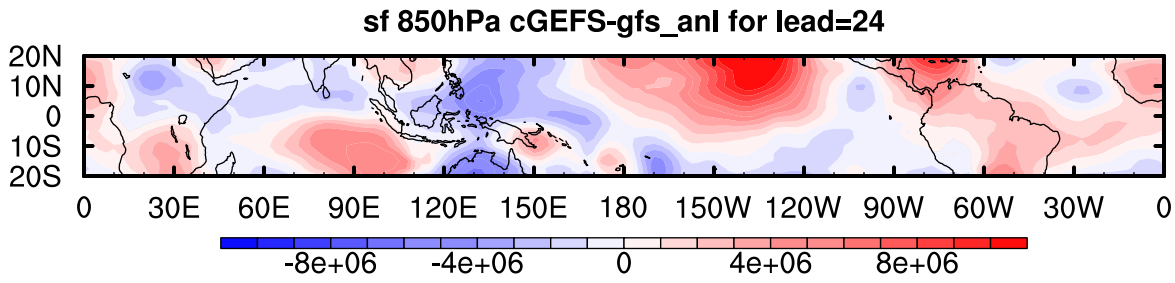

u 200hPa cGEFS-gfs_anl for lead=24
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

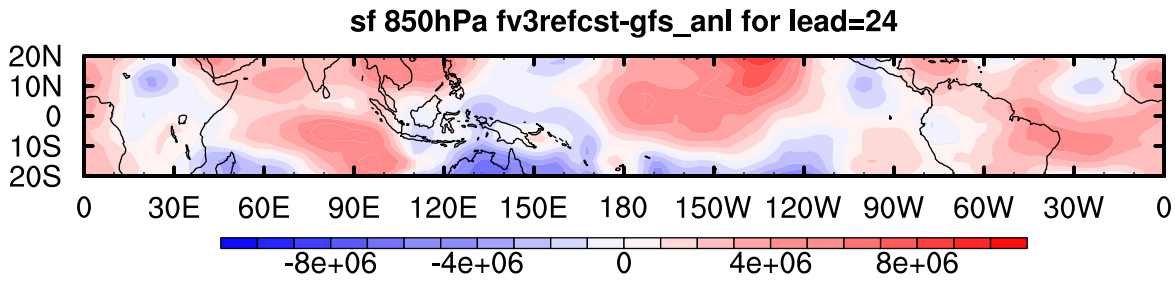

u 200hPa fv3refcst-gfs_anl for lead=24
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

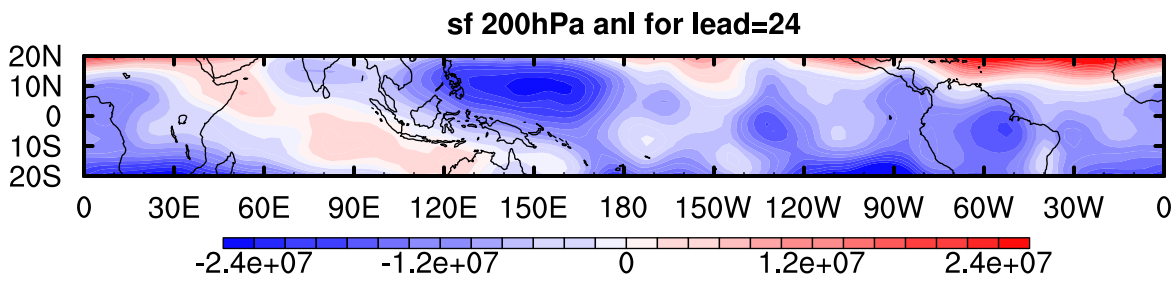

sf 850hPa anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

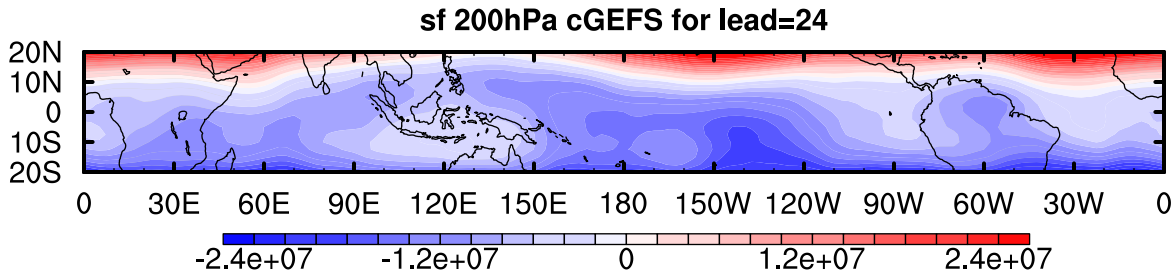

sf 850hPa cGEFS for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

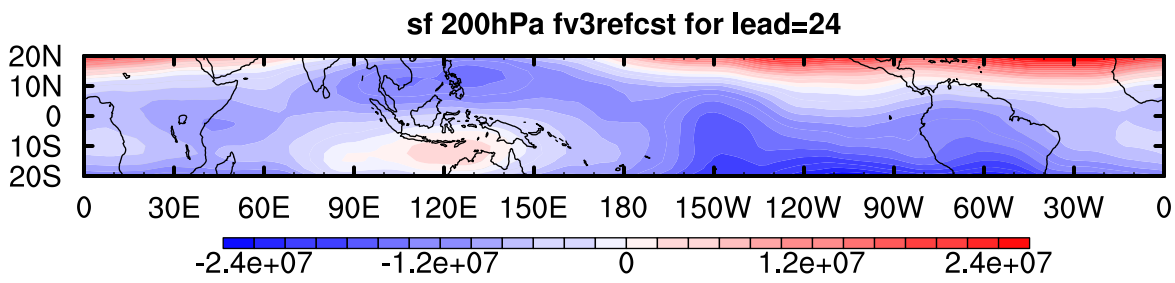

sf 850hPa fv3refcst for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

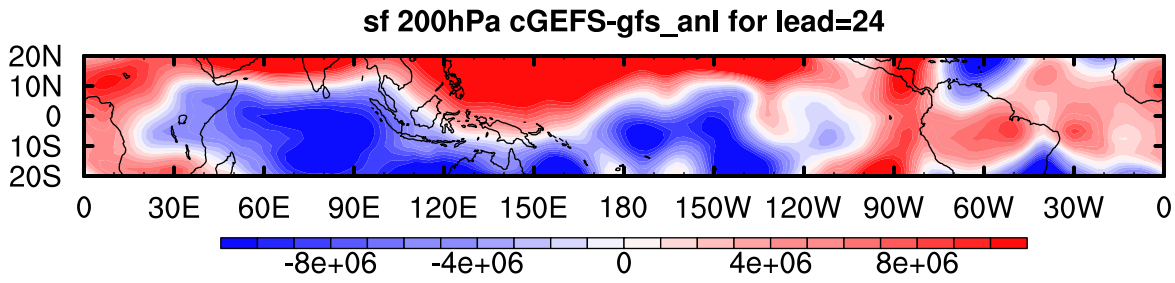

sf 850hPa cGEFS-gfs_anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

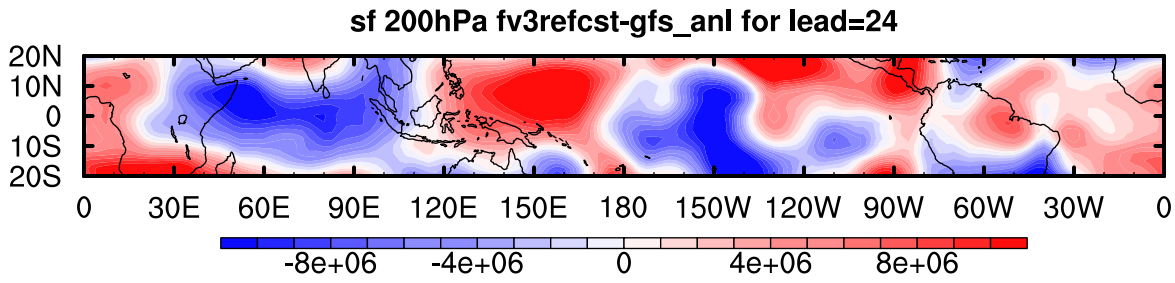

sf 850hPa fv3refcst-gfs_anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

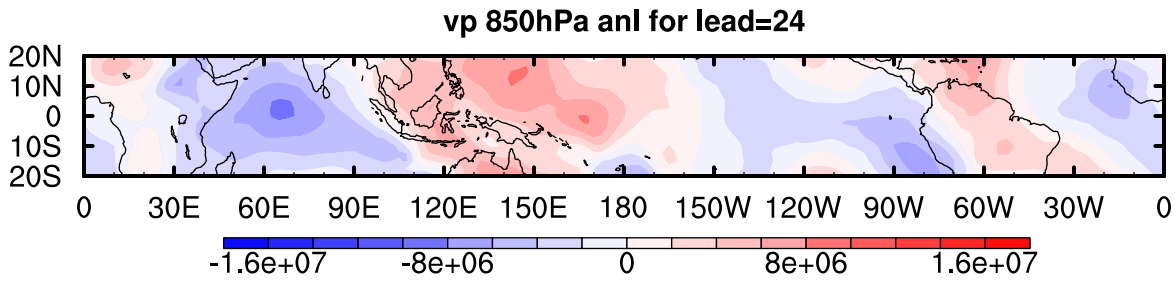

sf 200hPa anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

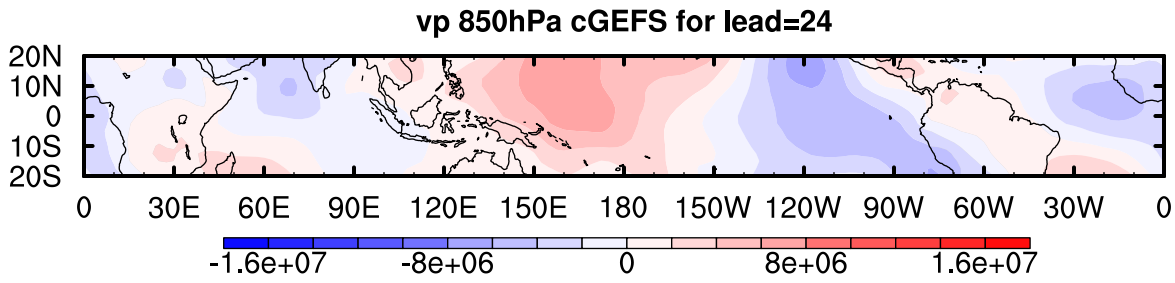

sf 200hPa cGEFS for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

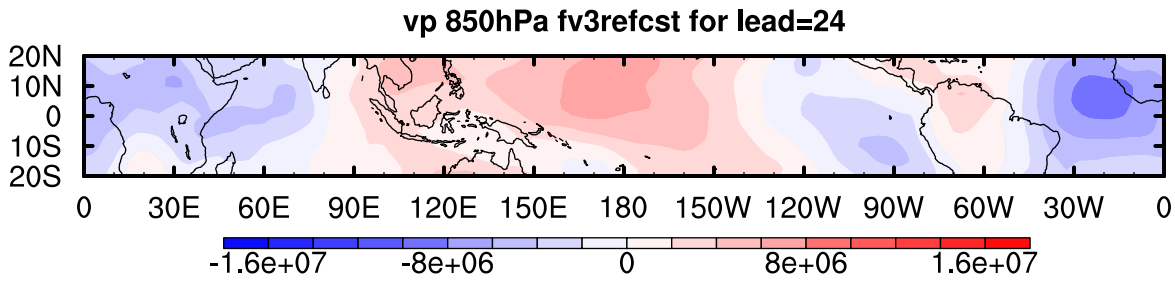

sf 200hPa fv3refcst for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

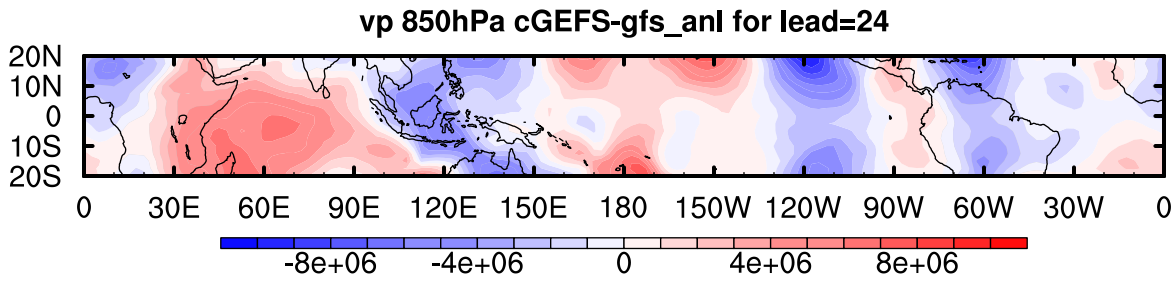

sf 200hPa cGEFS-gfs_anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

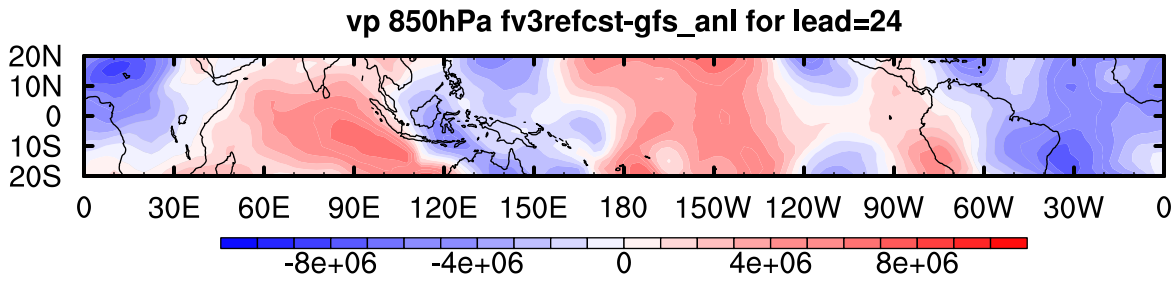

sf 200hPa fv3refcst-gfs_anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

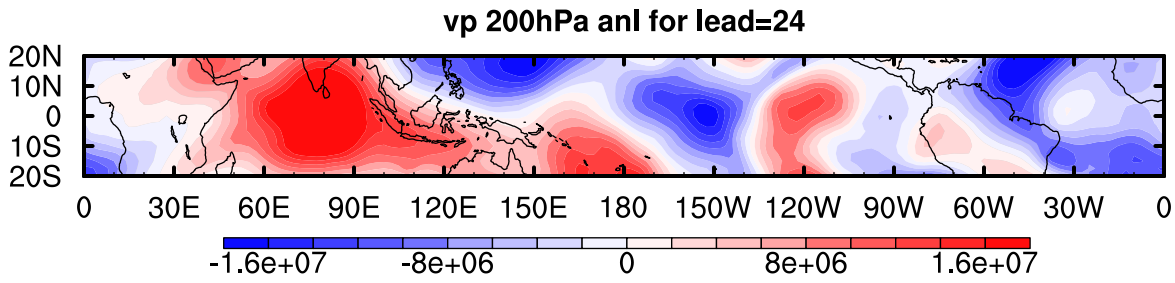

vp 850hPa anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

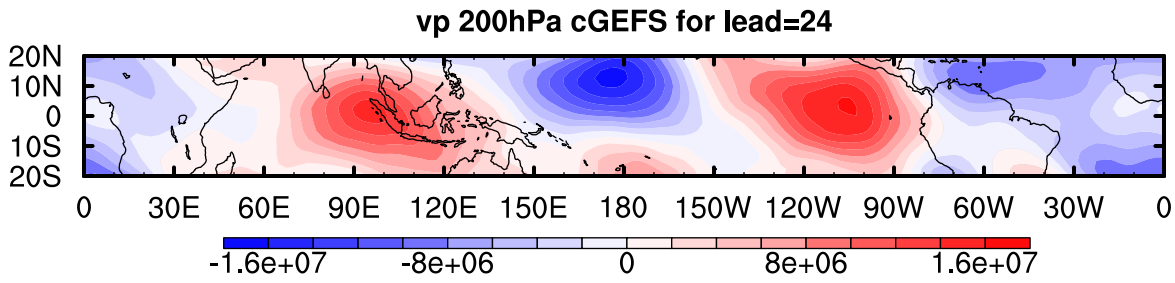

vp 850hPa cGEFS for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

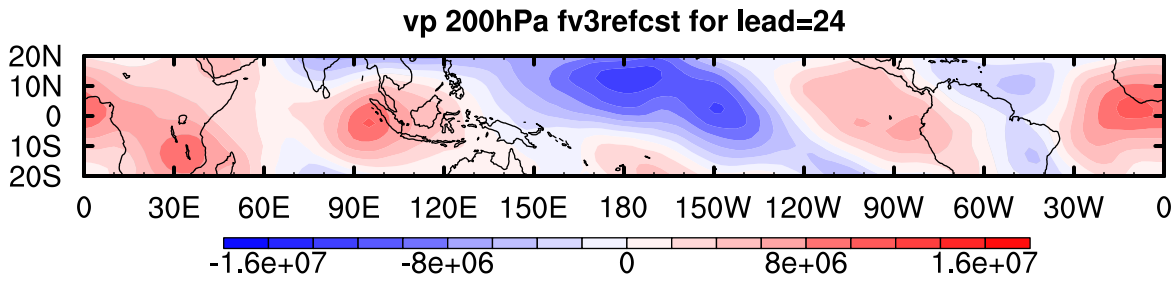

vp 850hPa fv3refcst for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

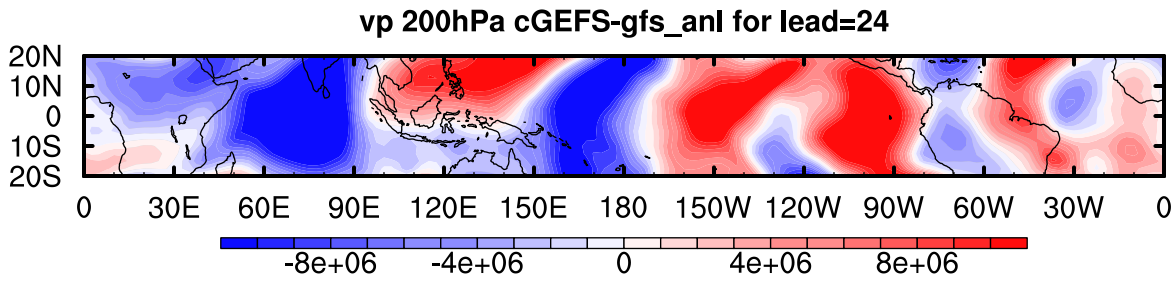

vp 850hPa cGEFS-gfs_anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

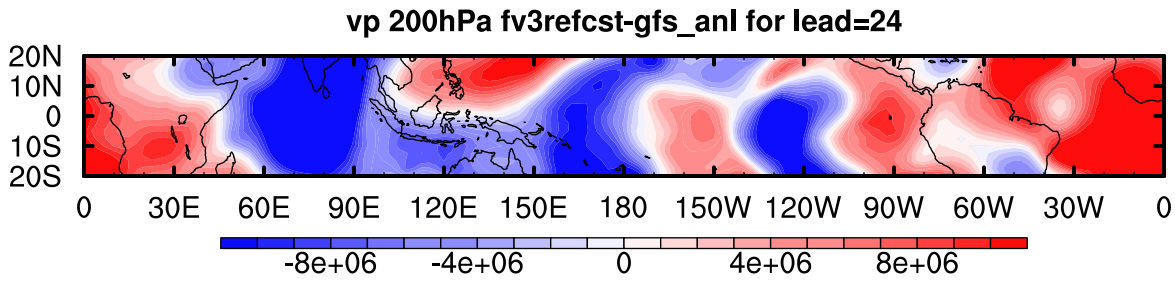

vp 850hPa fv3refcst-gfs_anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

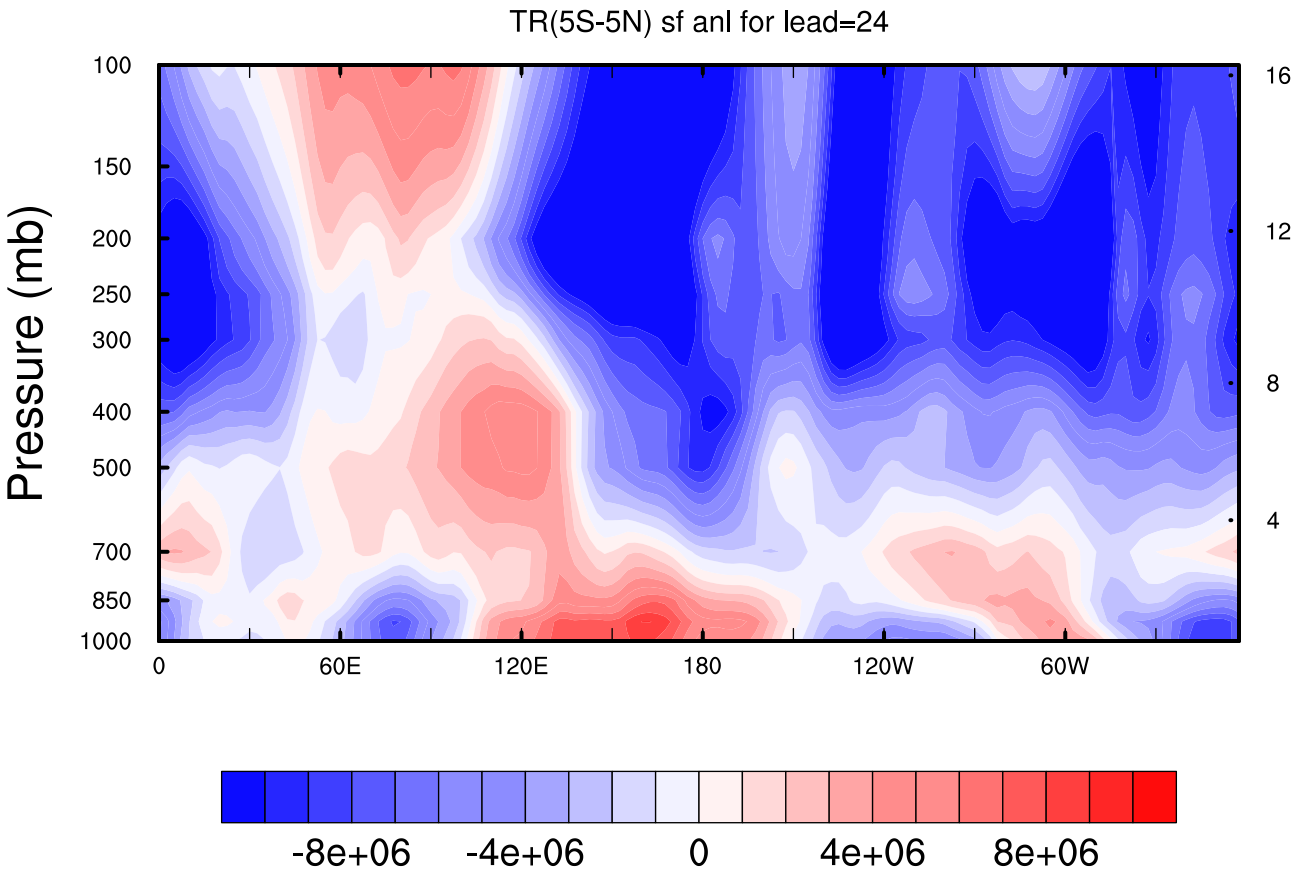

vp 200hPa anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

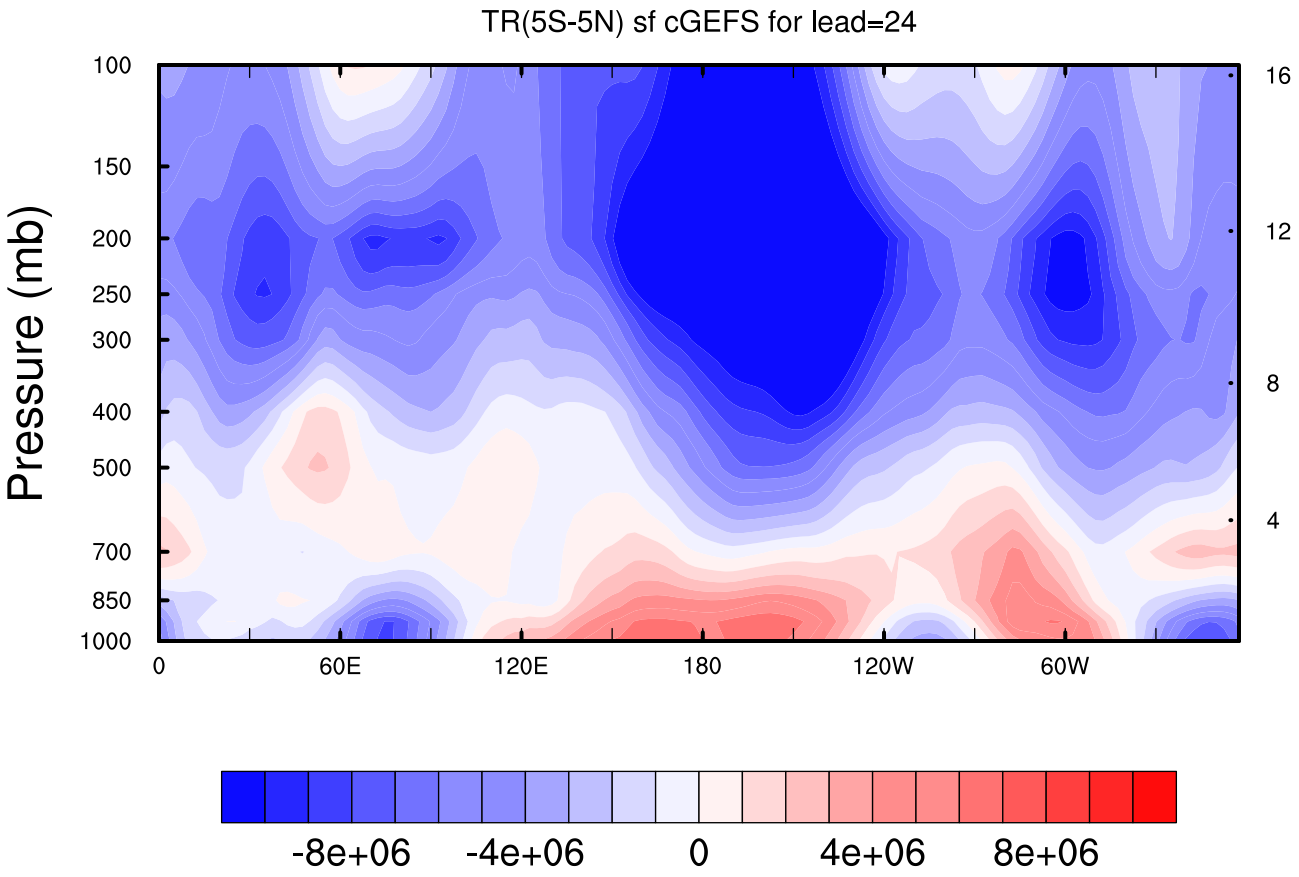

vp 200hPa cGEFS for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

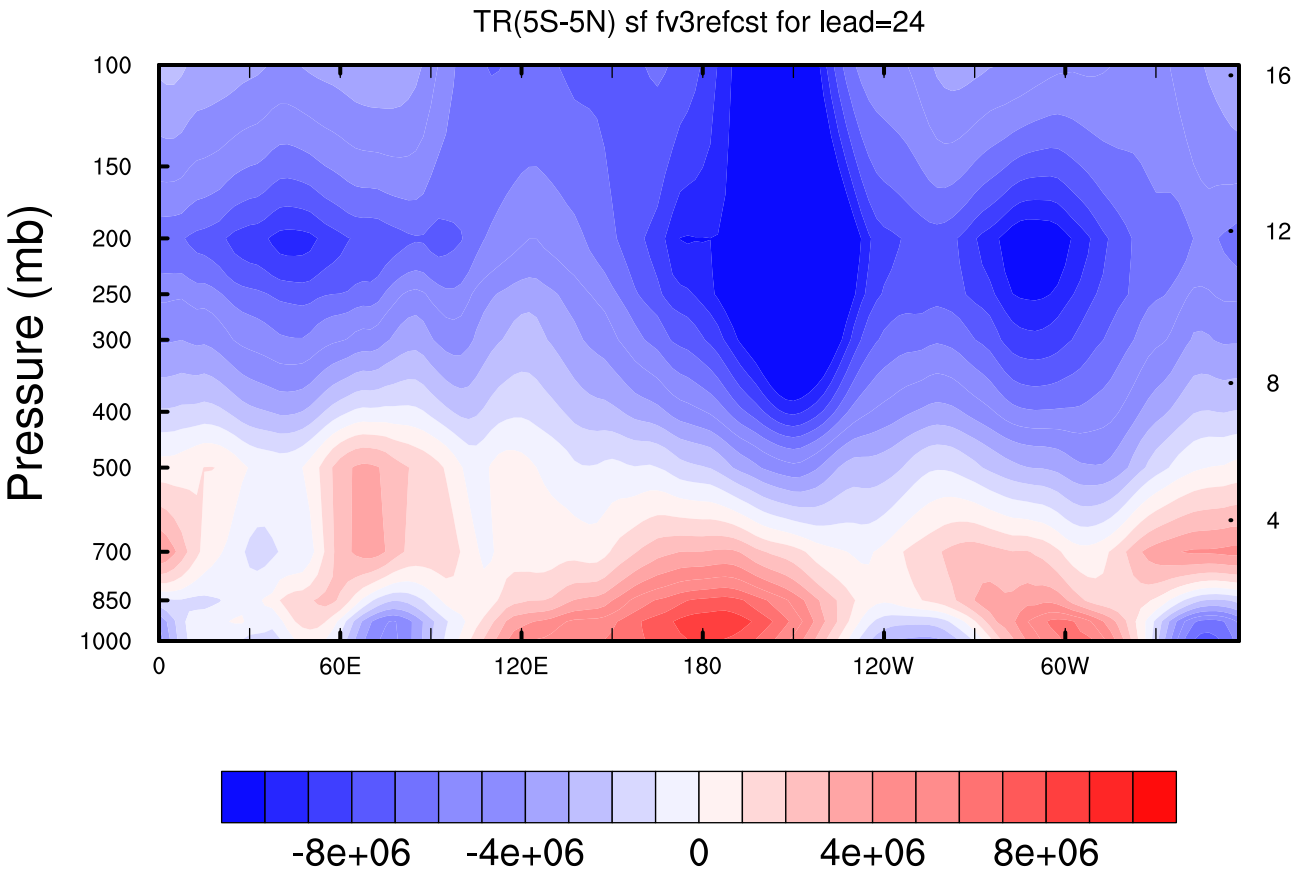

vp 200hPa fv3refcst for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

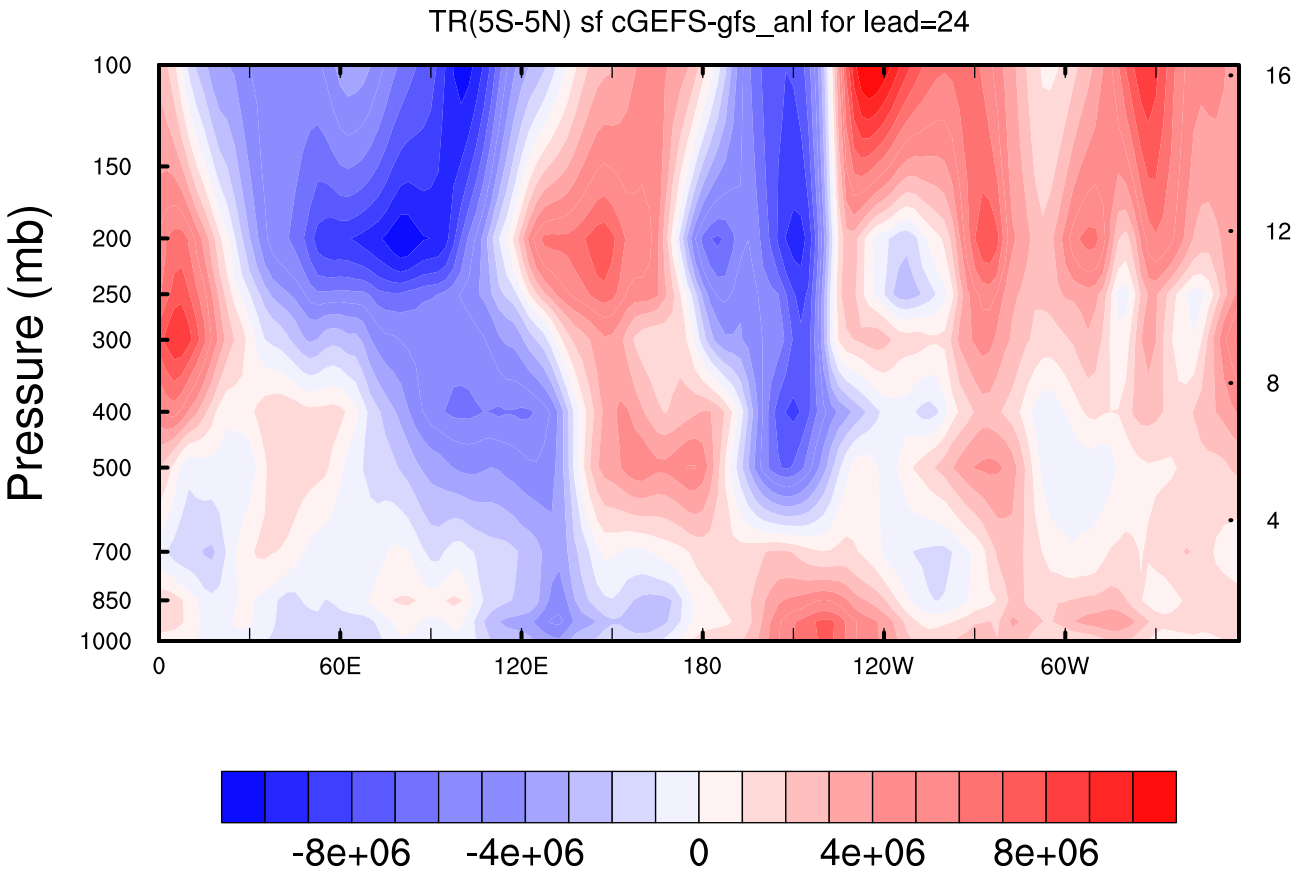

vp 200hPa cGEFS-gfs_anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

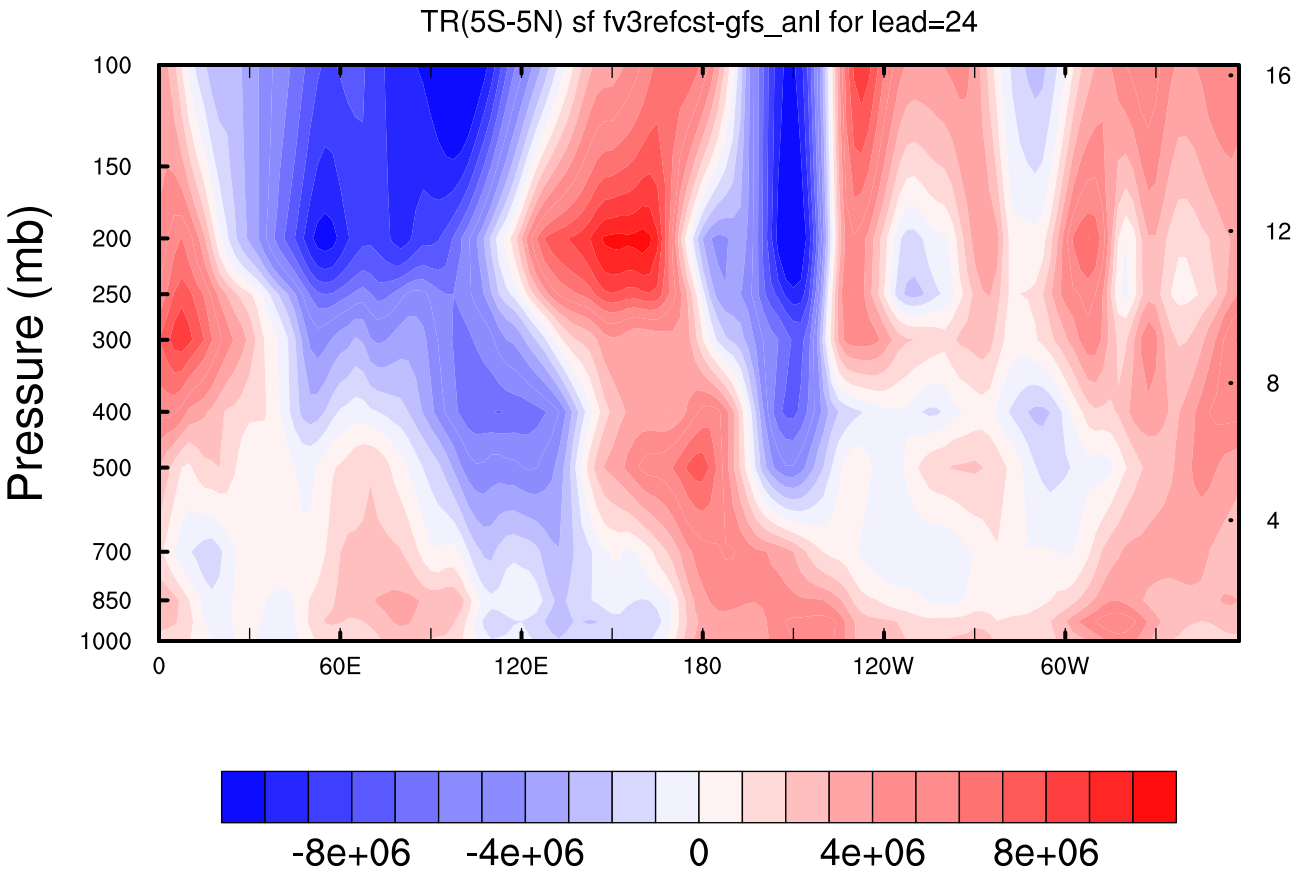

vp 200hPa fv3refcst-gfs_anl for lead=24
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

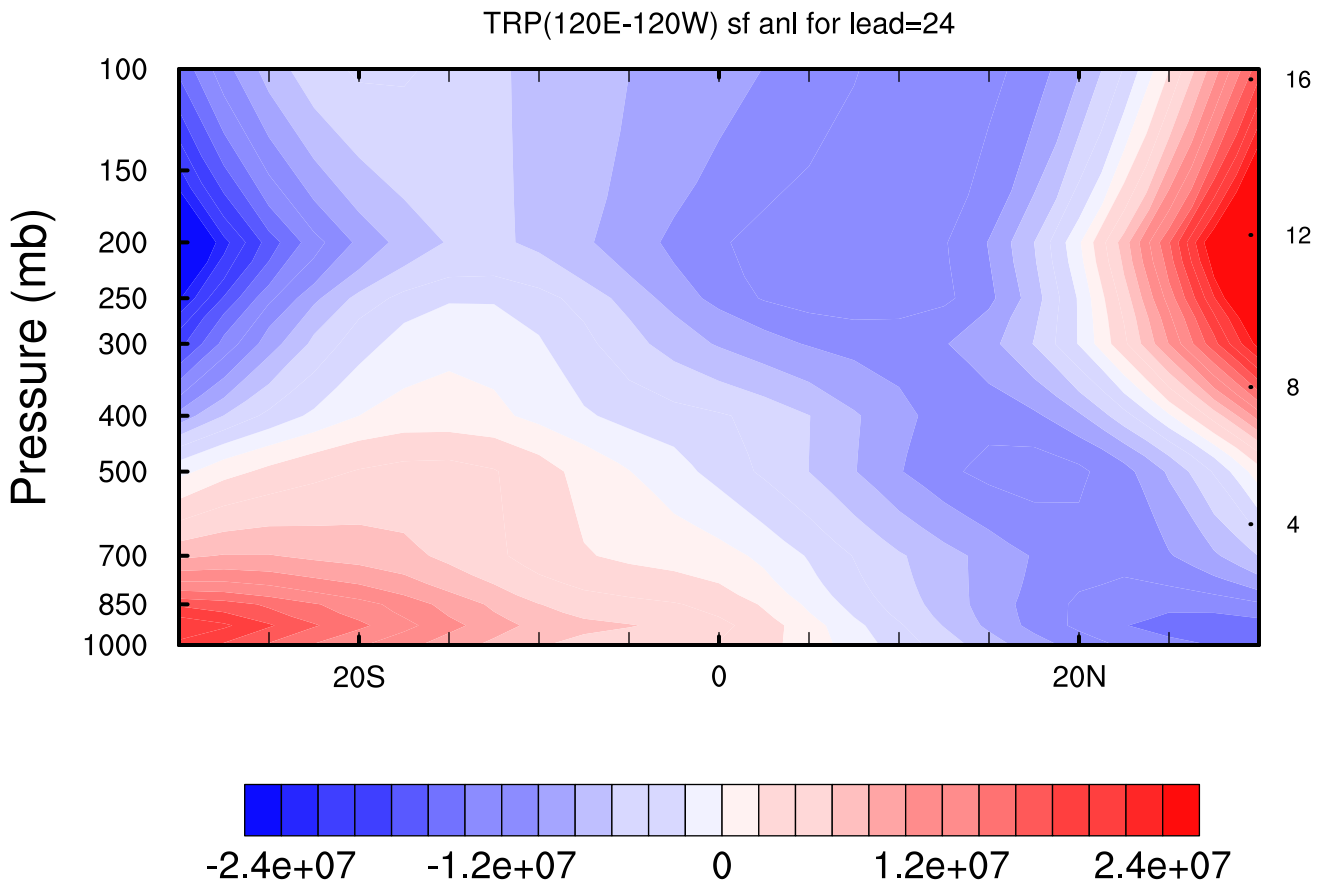

TR(5S-5N) sf anl for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

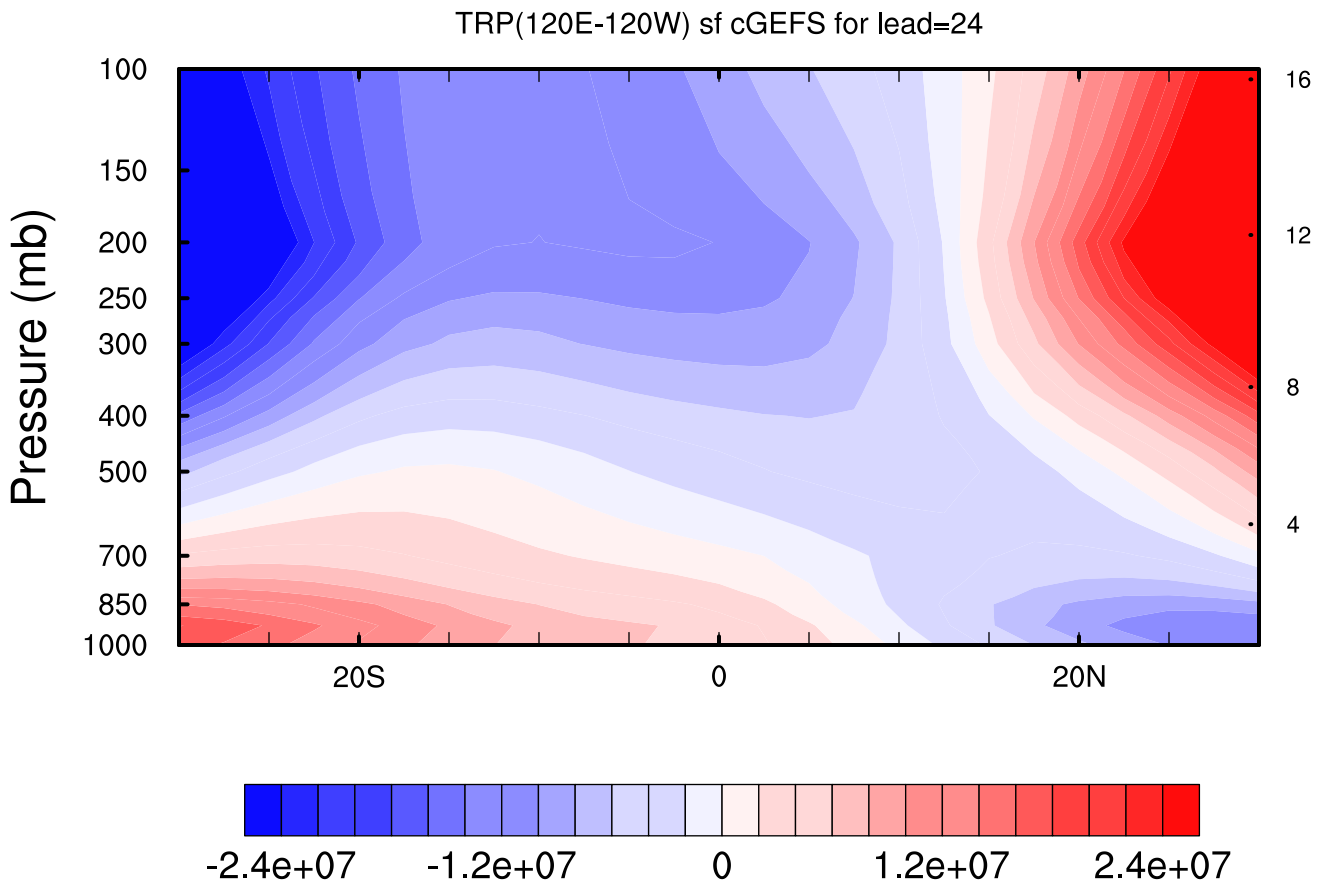

TR(5S-5N) sf cGEFS for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

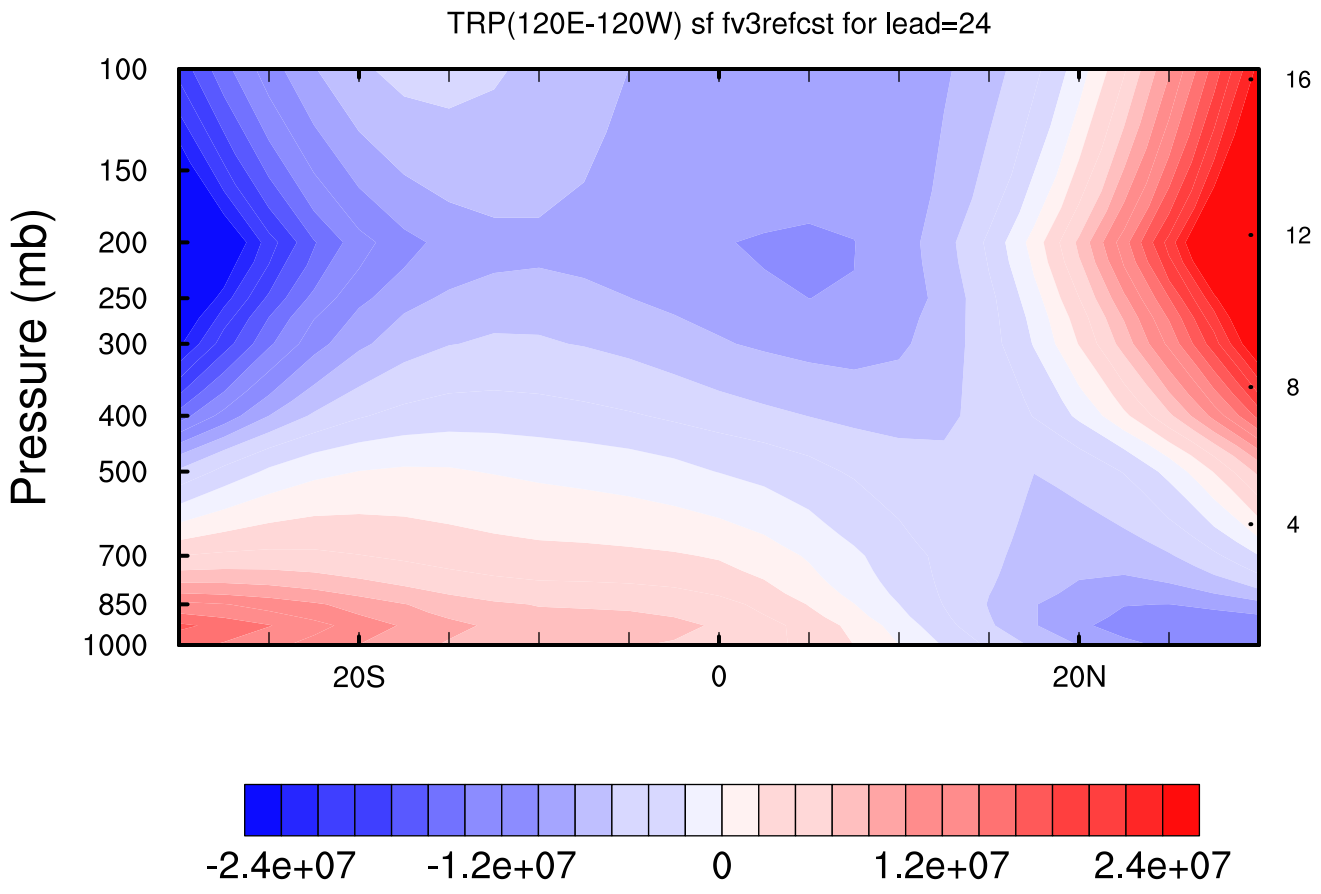

TR(5S-5N) sf fv3refcst for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

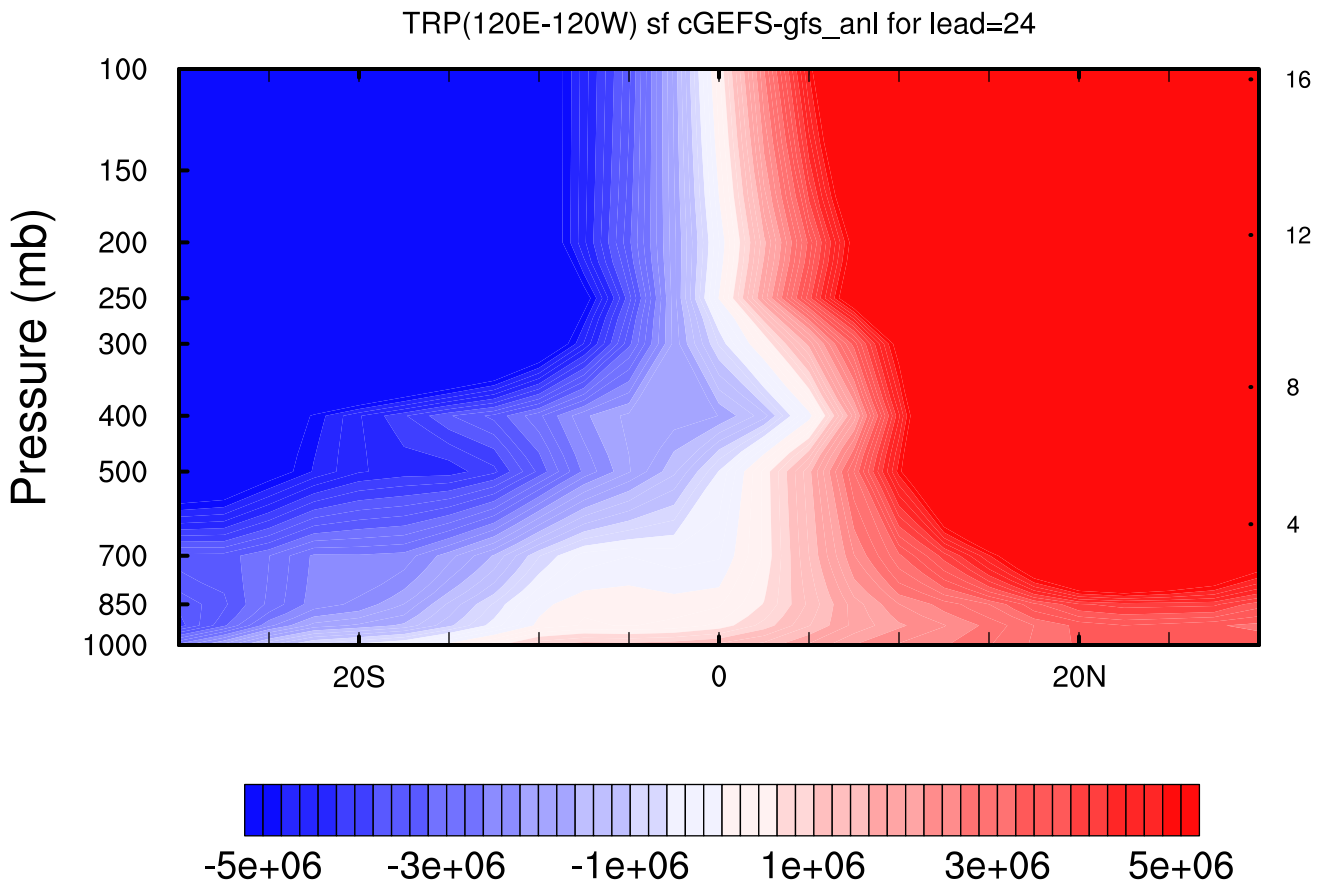

TR(5S-5N) sf cGEFS-gfs_anl for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

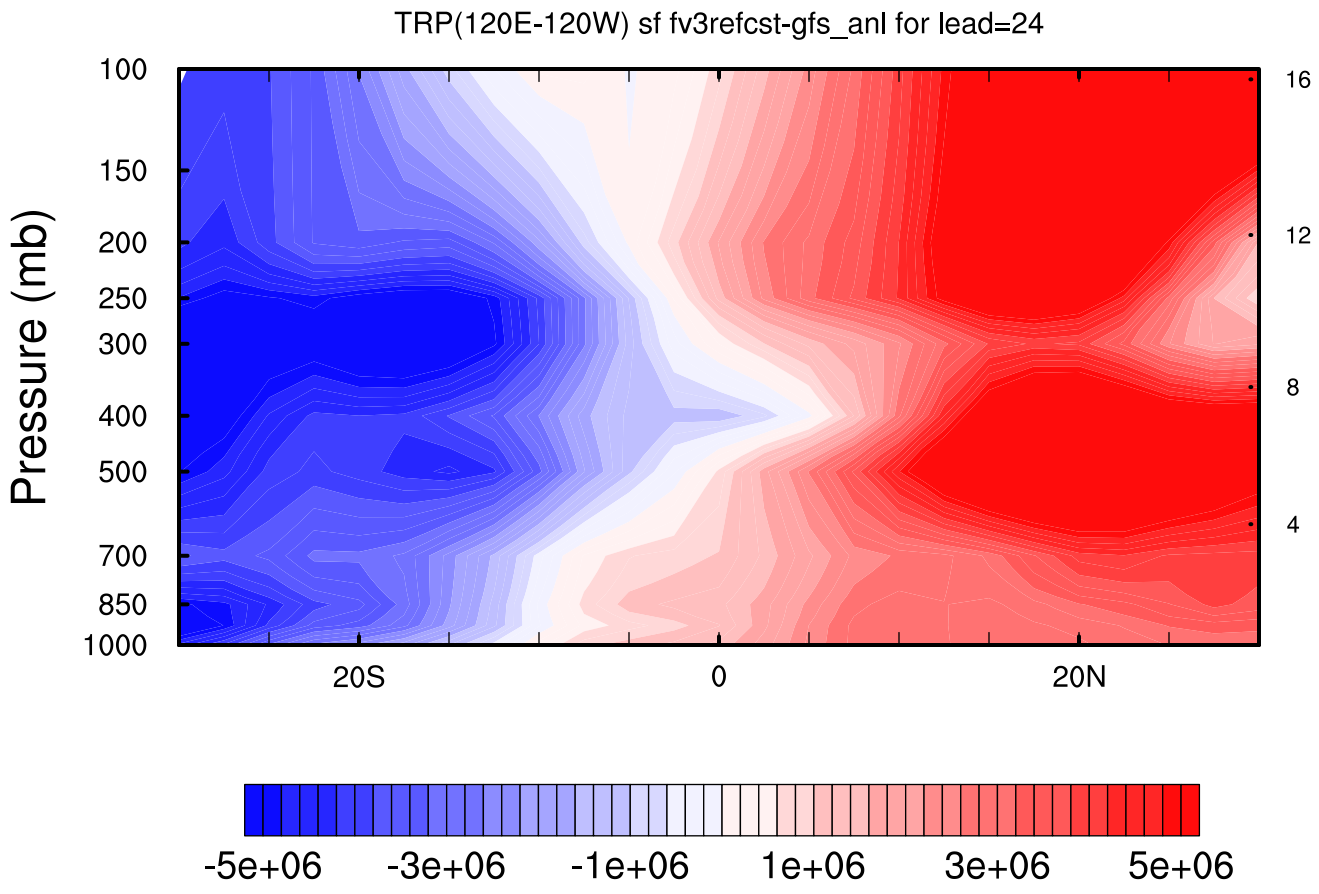

TR(5S-5N) sf fv3refcst-gfs_anl for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

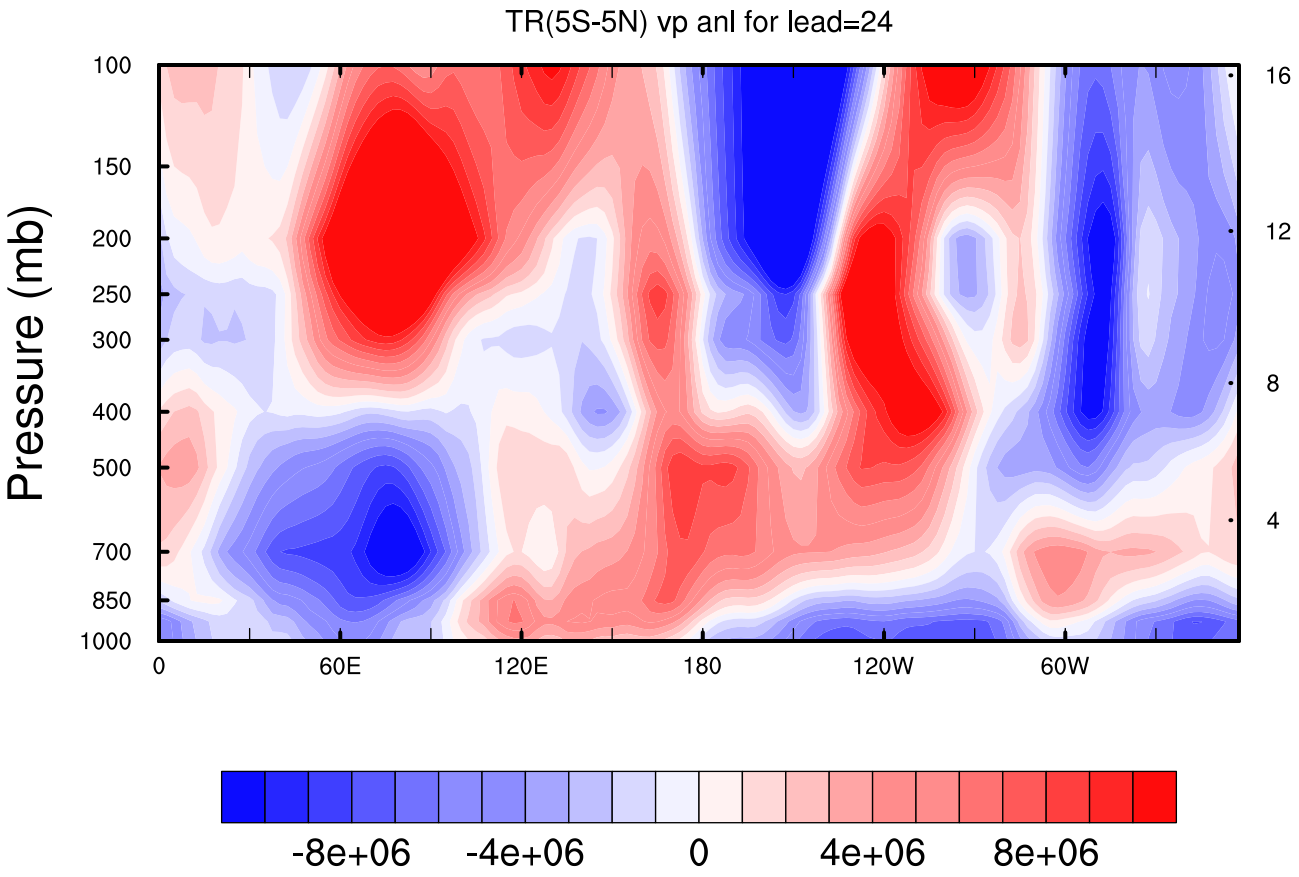

TRP(120E-120W) sf anl for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

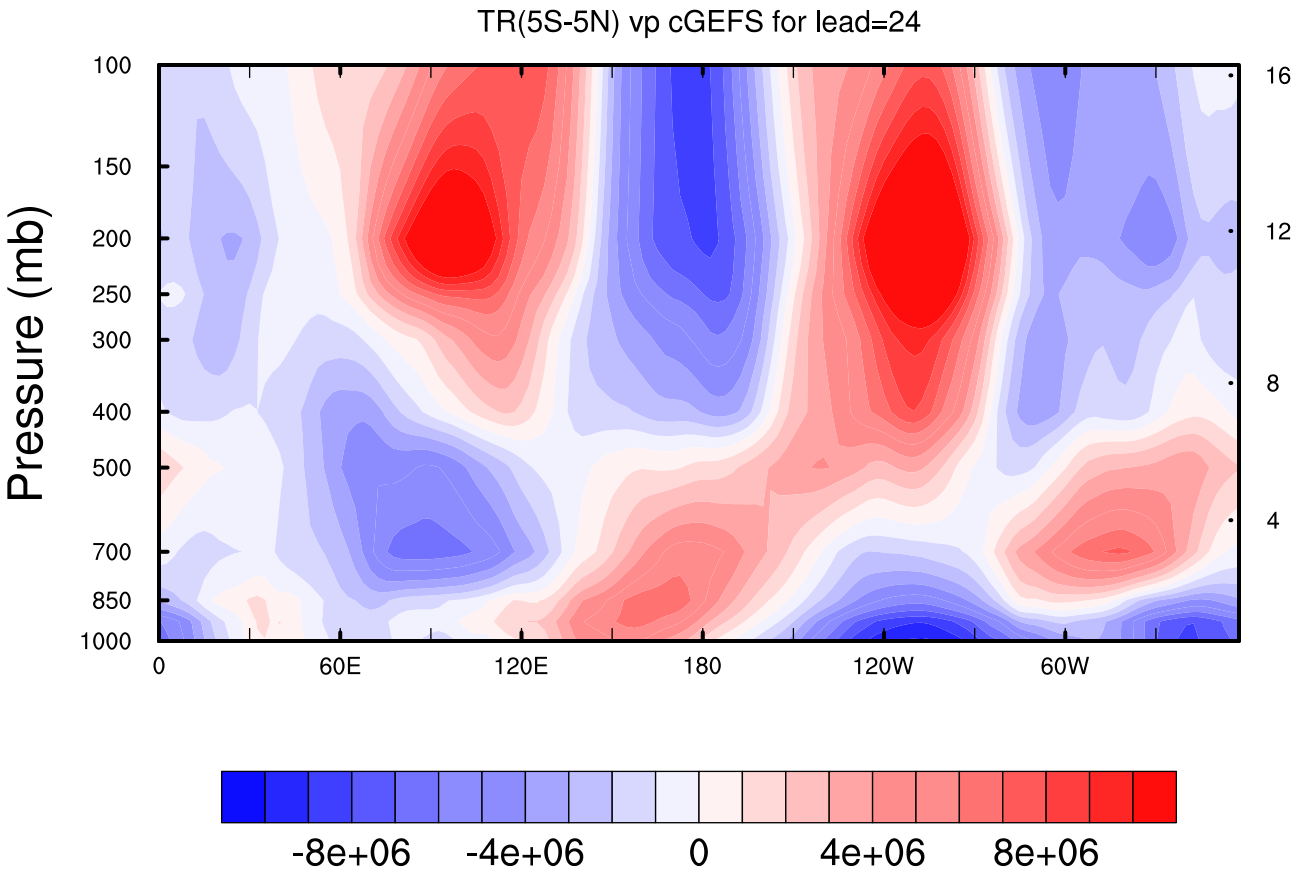

TRP(120E-120W) sf cGEFS for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

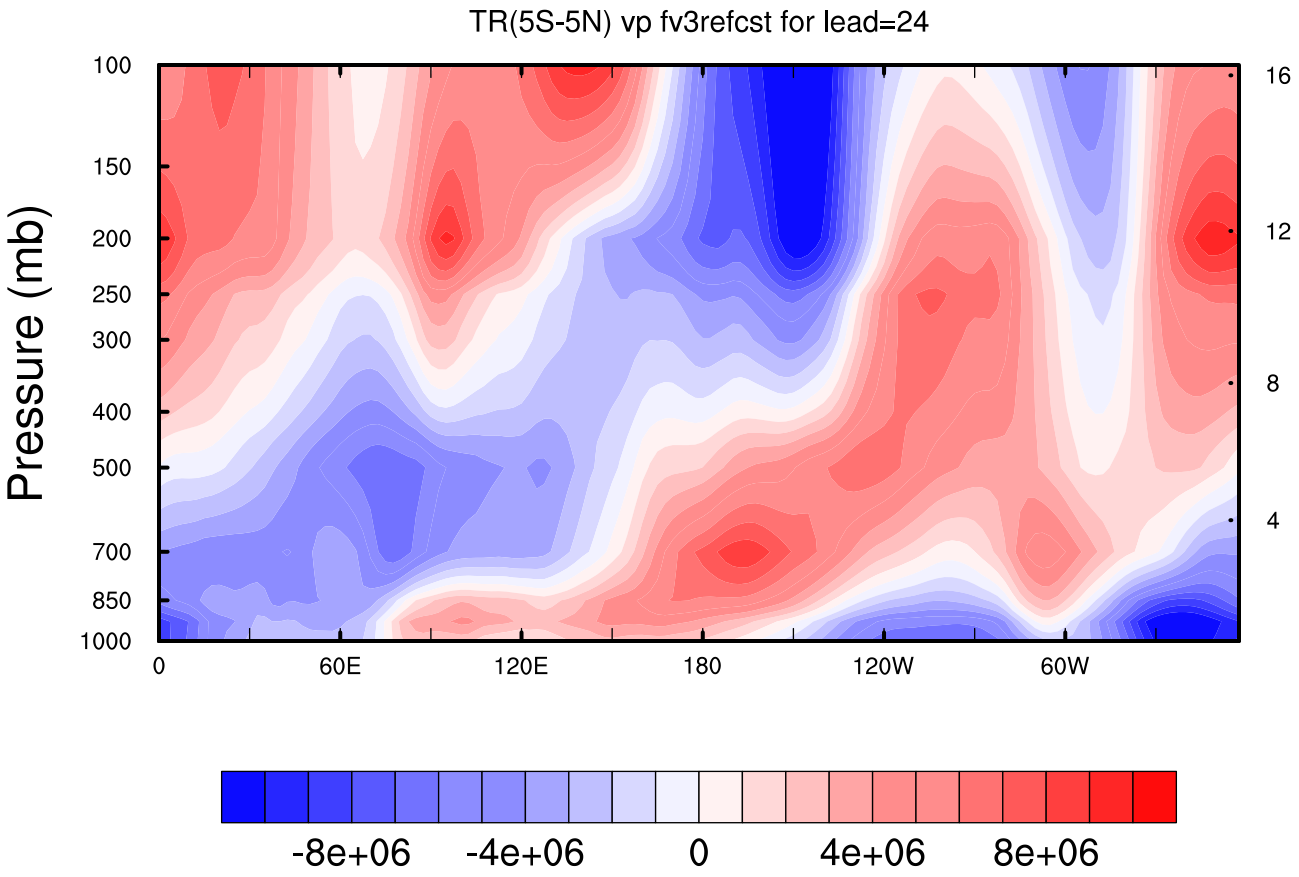

TRP(120E-120W) sf fv3refcst for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

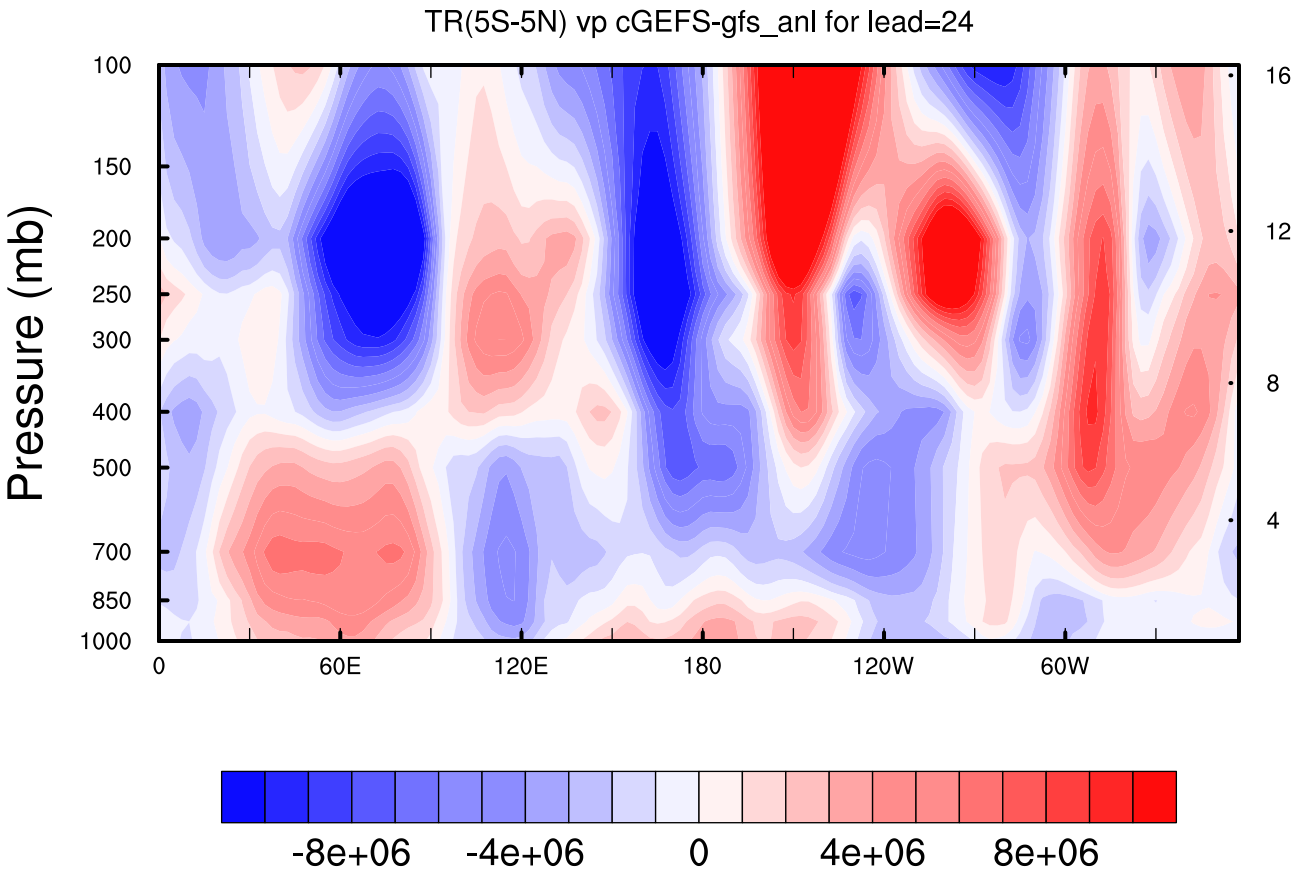

TRP(120E-120W) sf cGEFS-gfs_anl for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

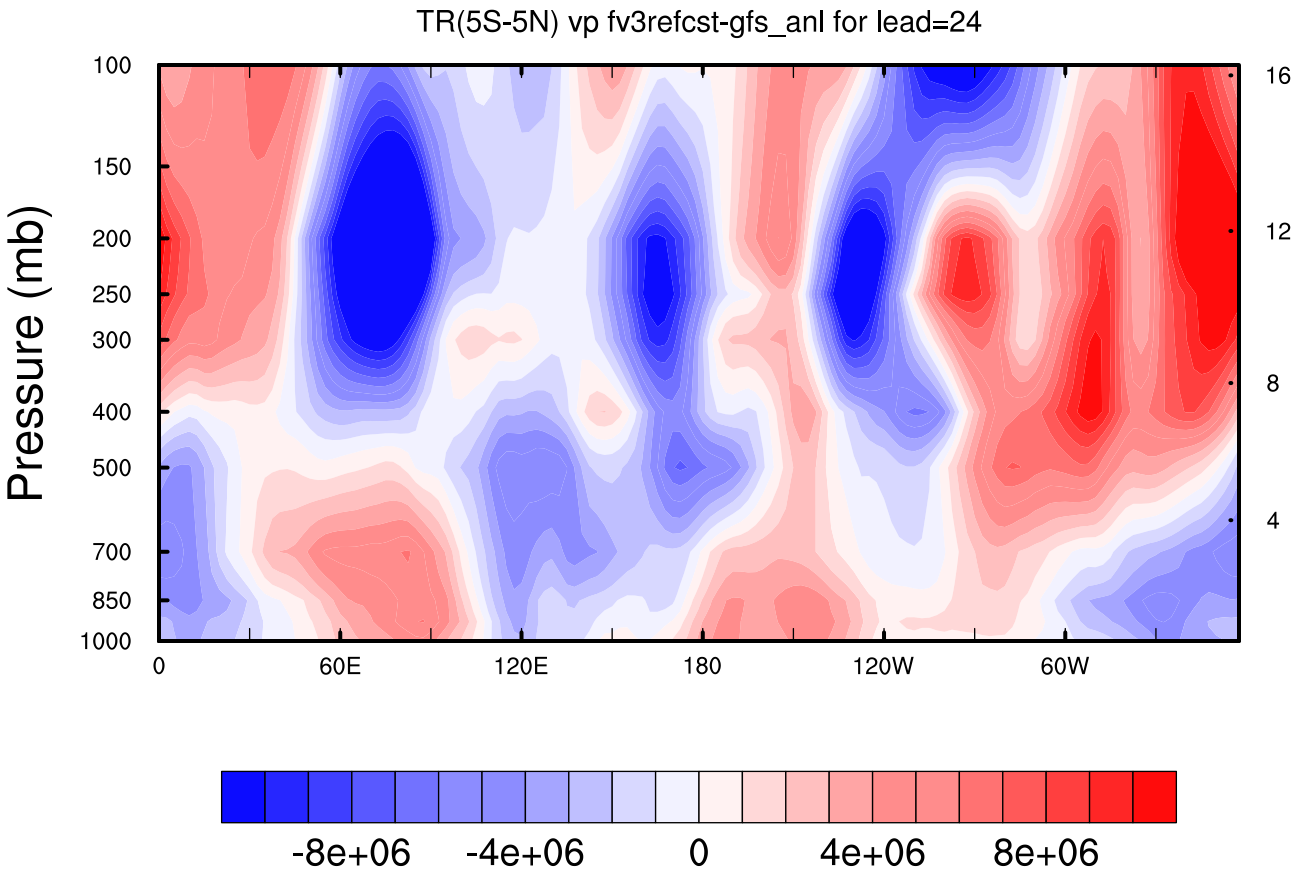

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

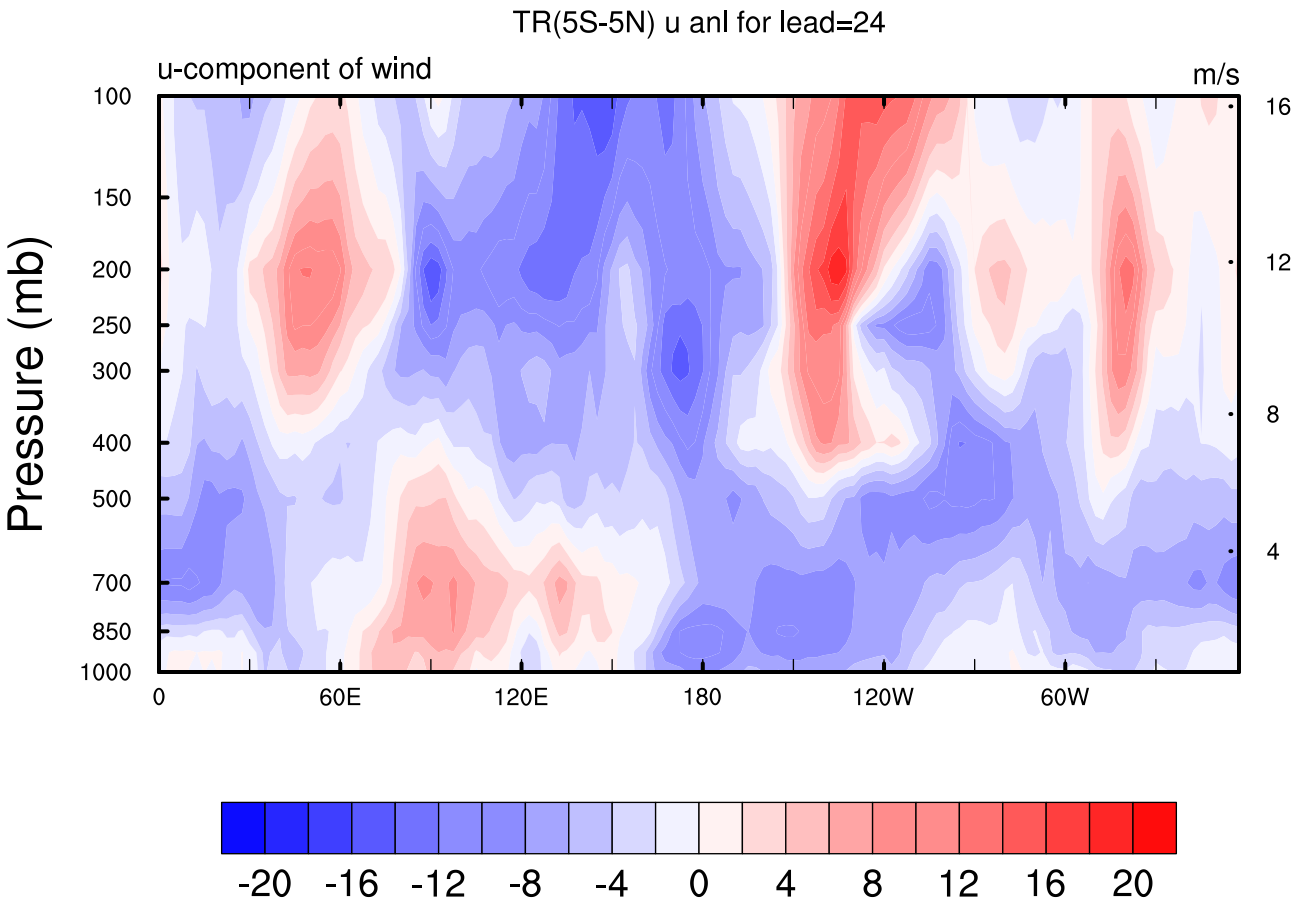

TR(5S-5N) vp anl for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

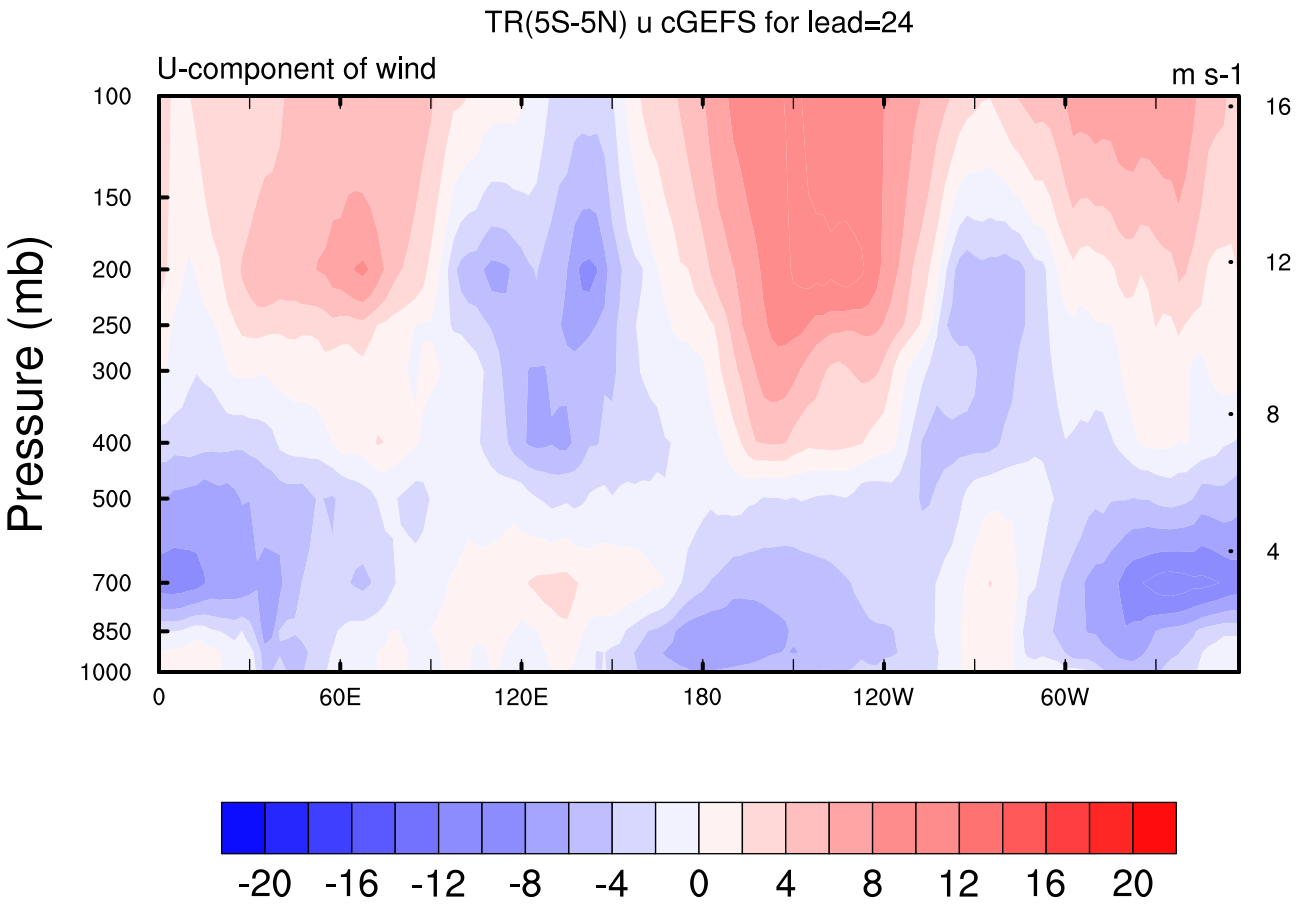

TR(5S-5N) vp cGEFS for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

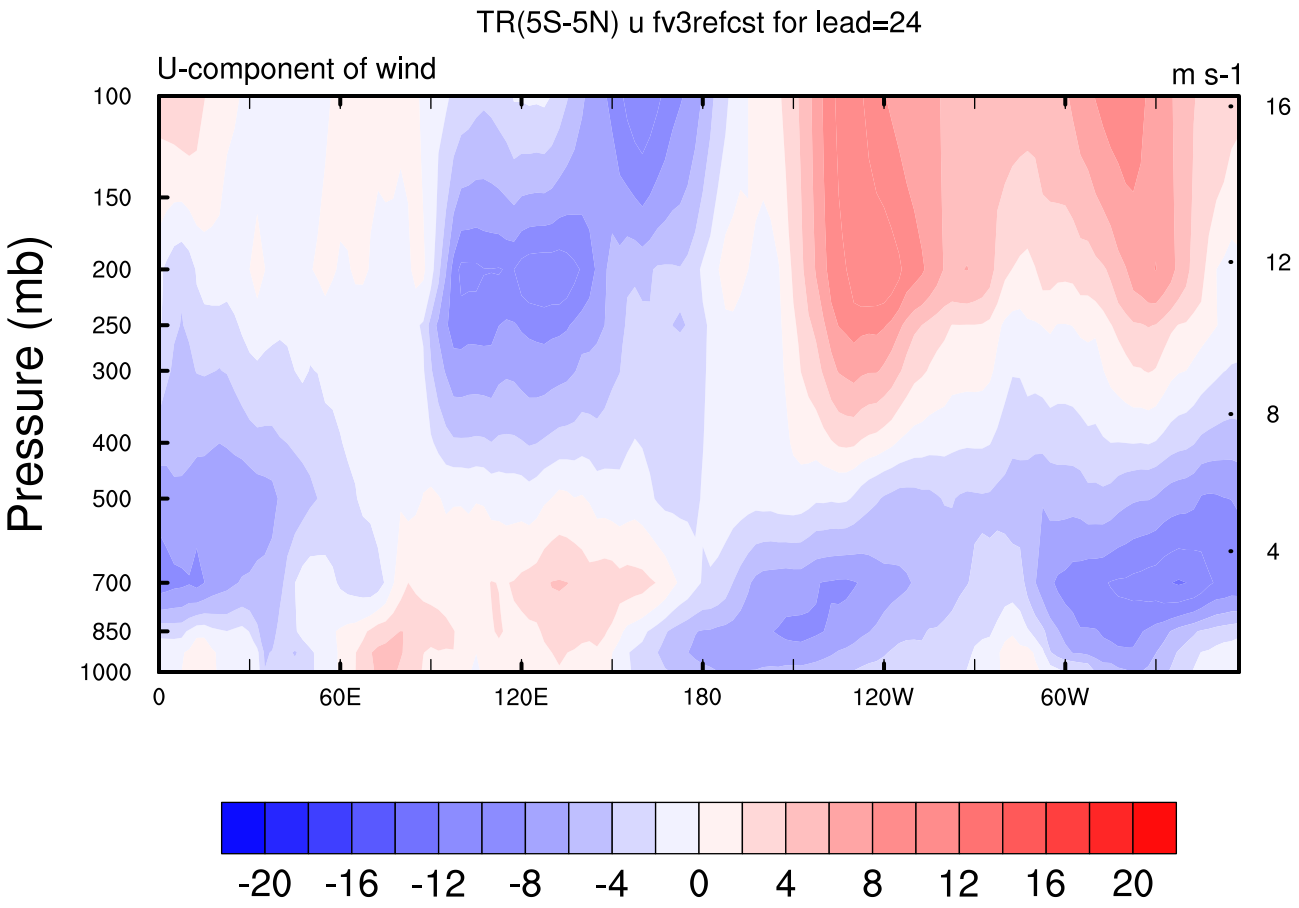

TR(5S-5N) vp fv3refcst for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

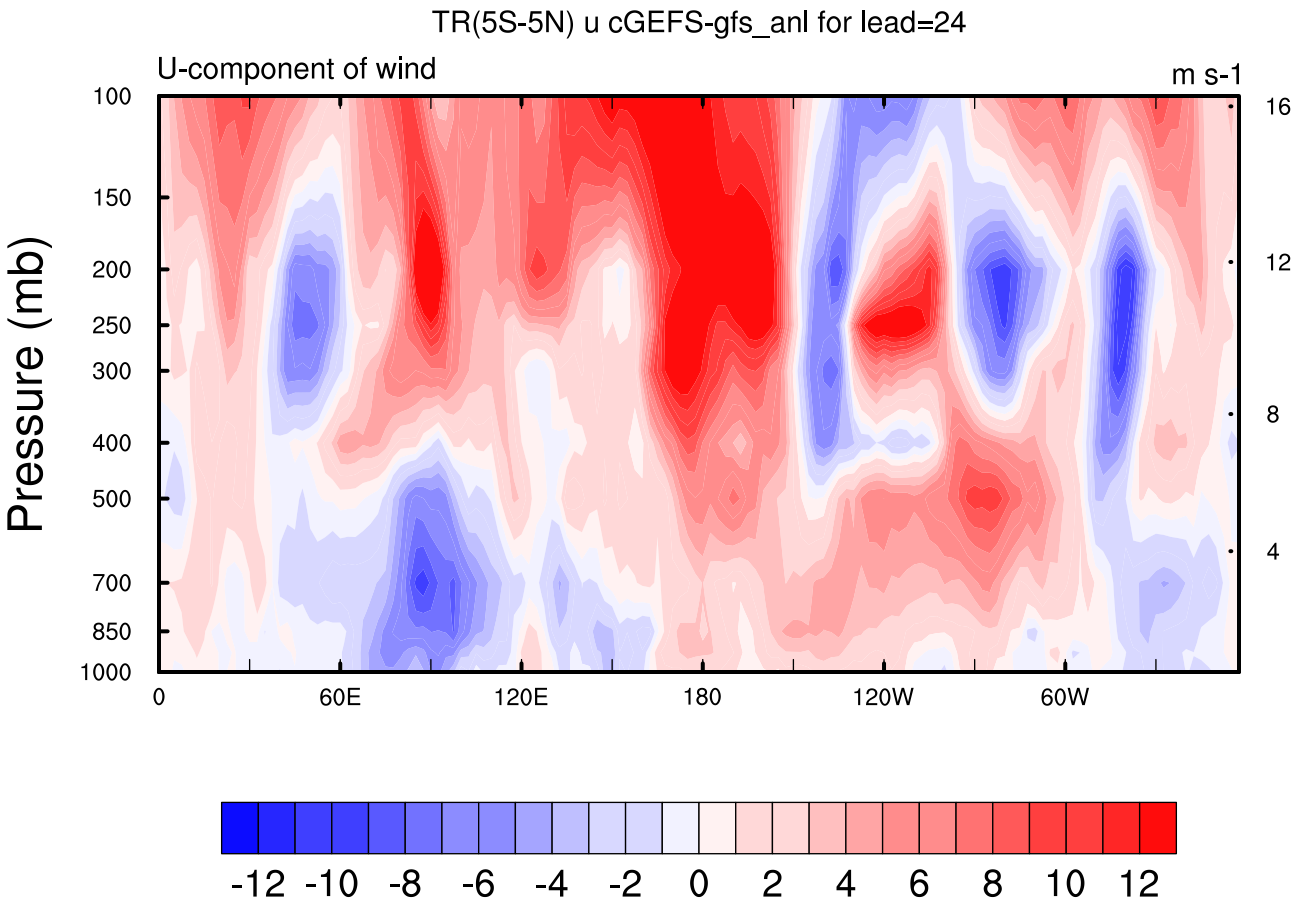

TR(5S-5N) vp cGEFS-gfs_anl for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst-gfs_anl for lead=24
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) u anl for lead=24
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS for lead=24
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u fv3refcst for lead=24
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=24
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
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4
-12
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-8
-6
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-2
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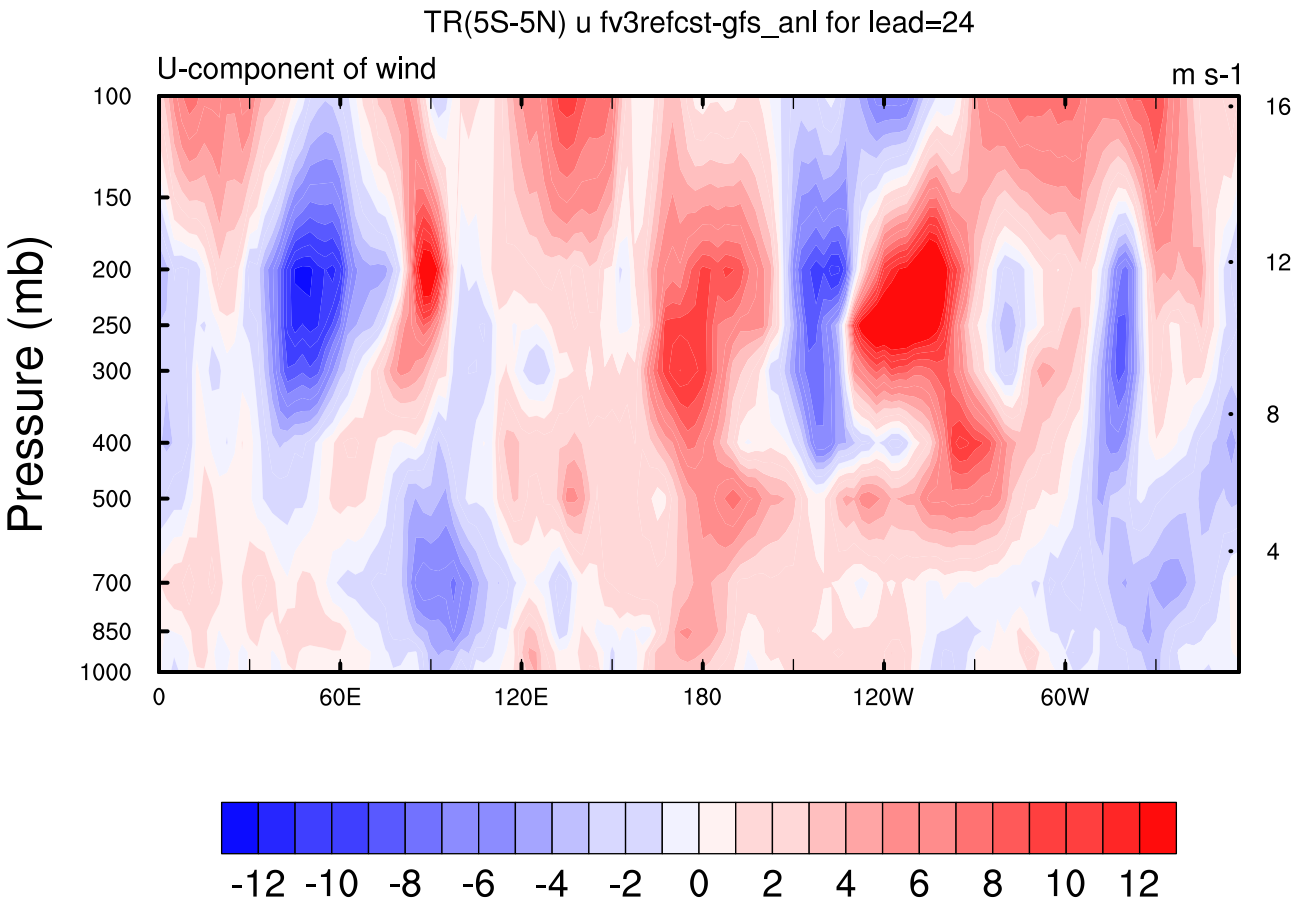
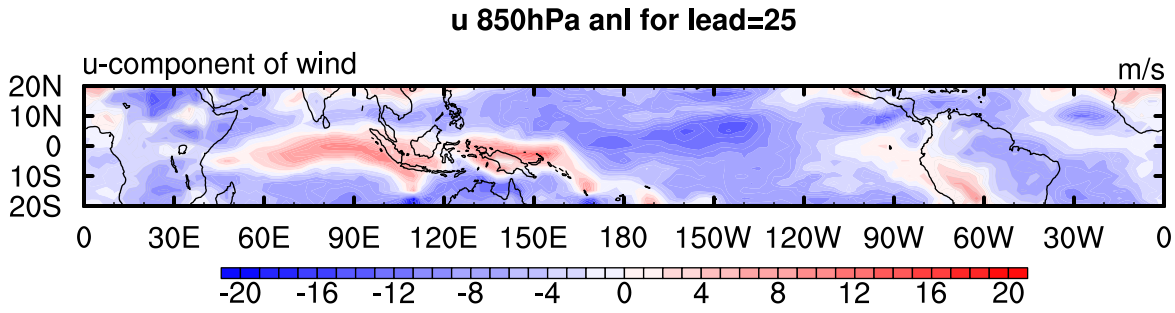
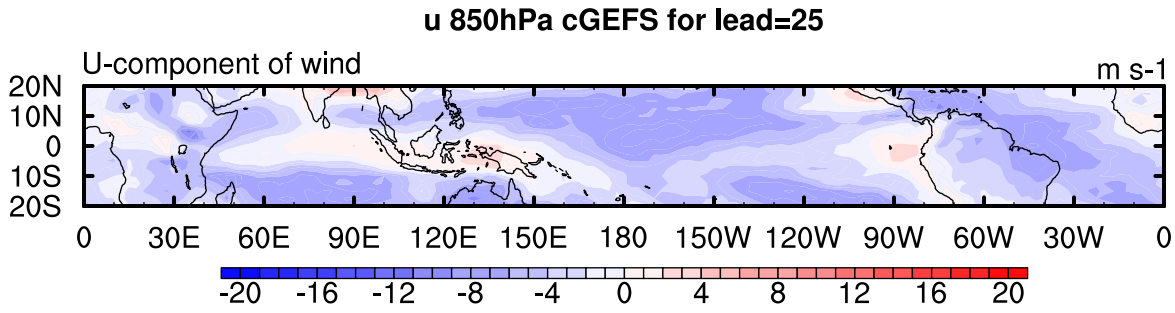
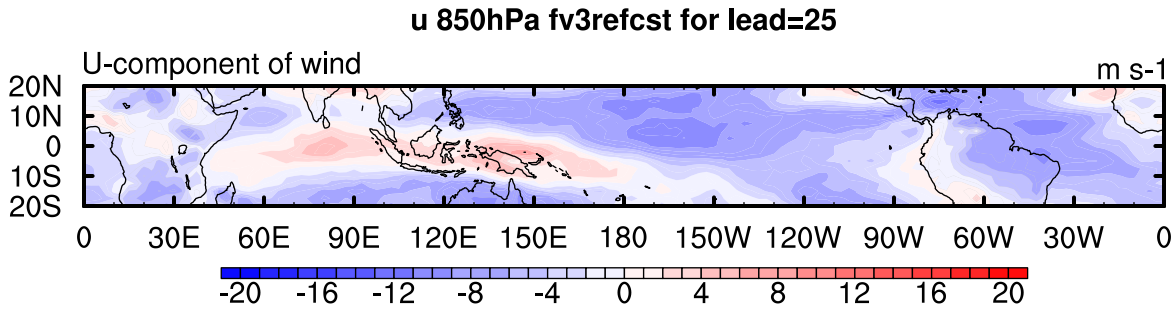
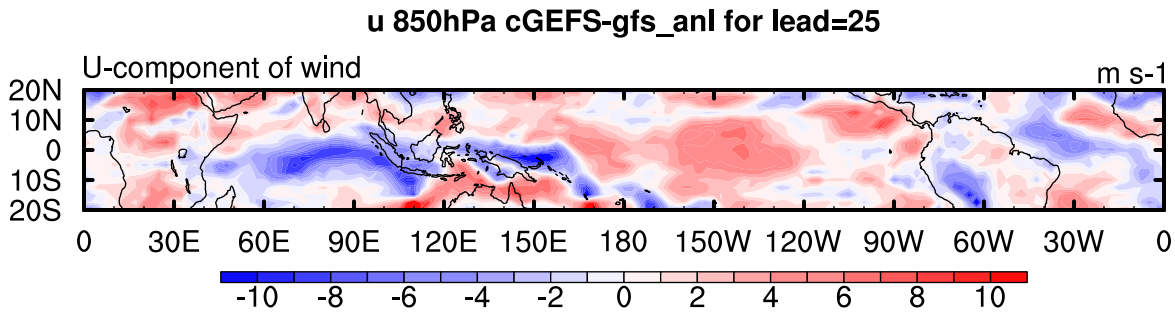
2
4
6
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=24
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


u 850hPa anl for lead=25
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS for lead=25
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa fv3refcst for lead=25
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=25
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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-10
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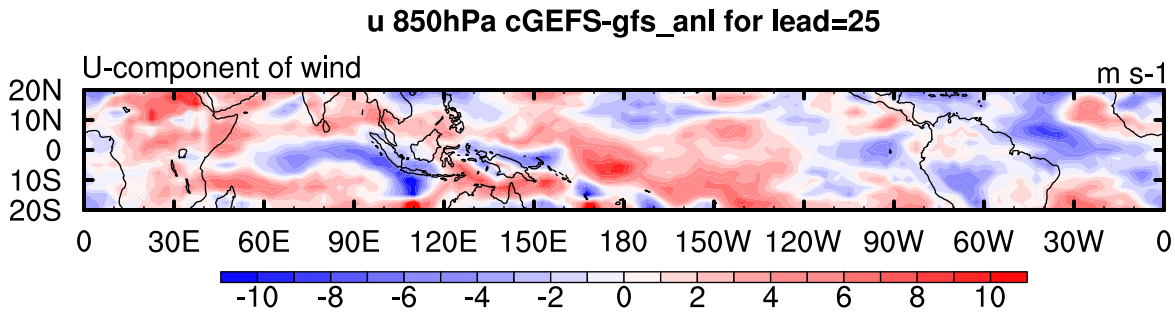
-4
-2
0
2
4
6
8
10


u 850hPa cGEFS-gfs_anl for lead=25
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-10
-8
-6
-4
-2
0
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4
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8
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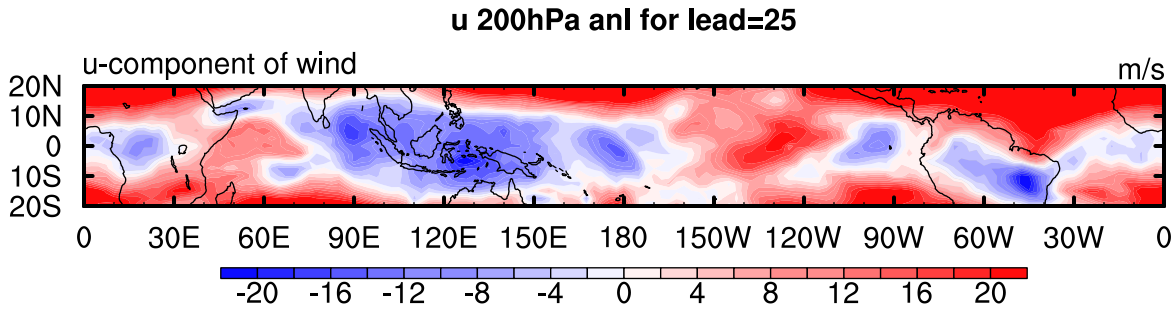
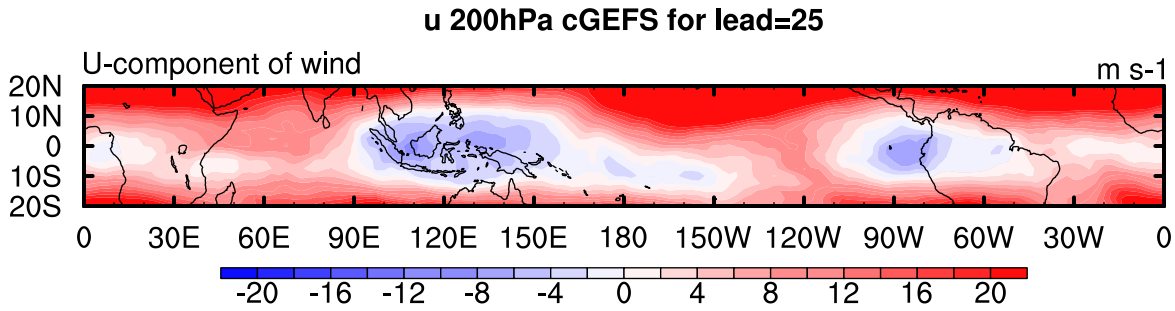

u 200hPa anl for lead=25
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=25
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
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-4
0
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8
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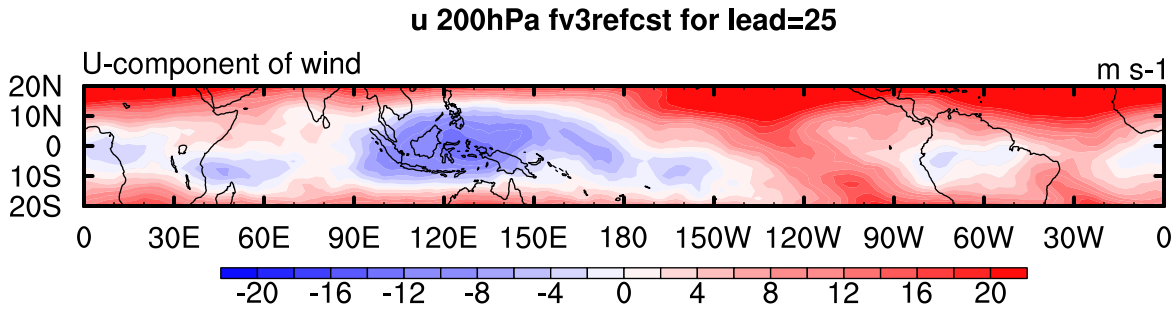
16
20


u 200hPa fv3refcst for lead=25
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-20
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-4
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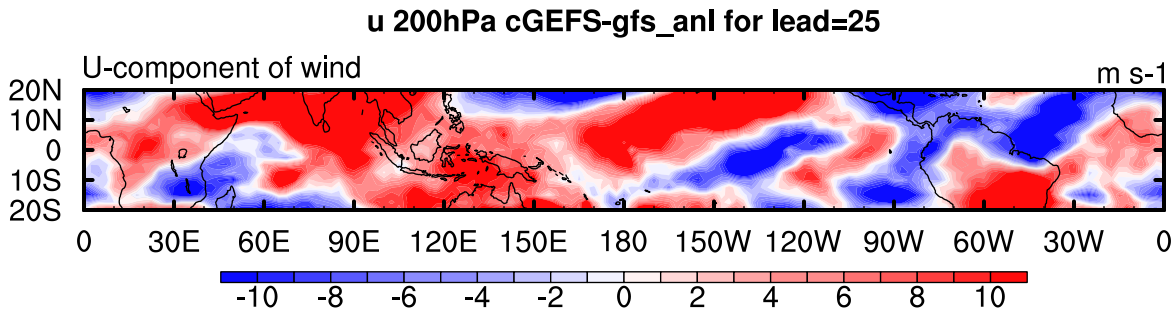
16
20


u 200hPa cGEFS-gfs_anl for lead=25
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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-10
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-2
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4
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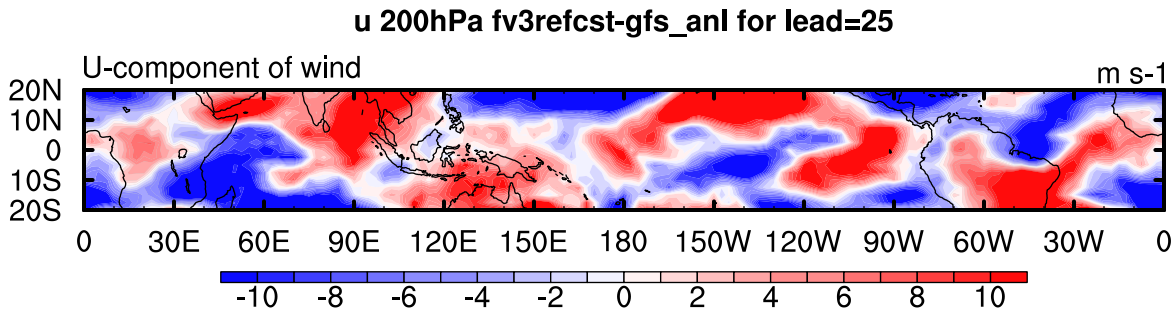
8
10


u 200hPa fv3refcst-gfs_anl for lead=25
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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-10
-8
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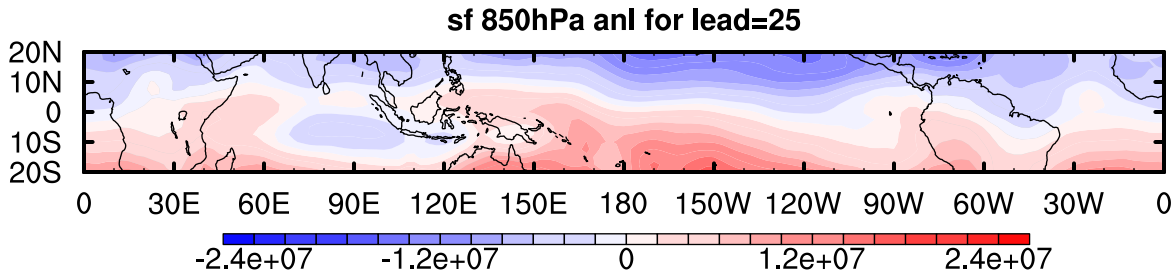
-4
-2
0
2
4
6
8
10


sf 850hPa anl for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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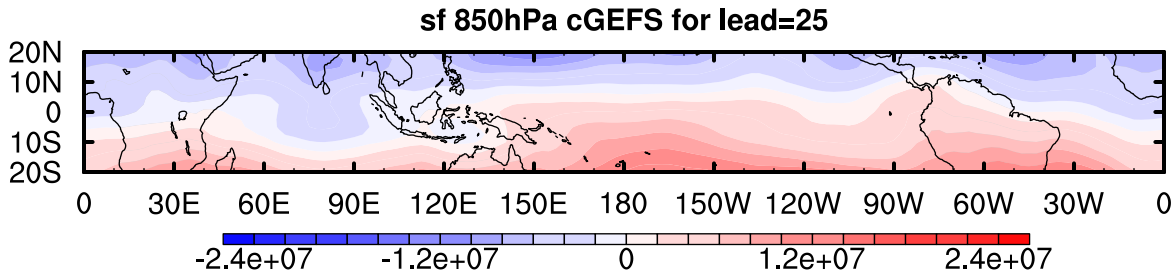
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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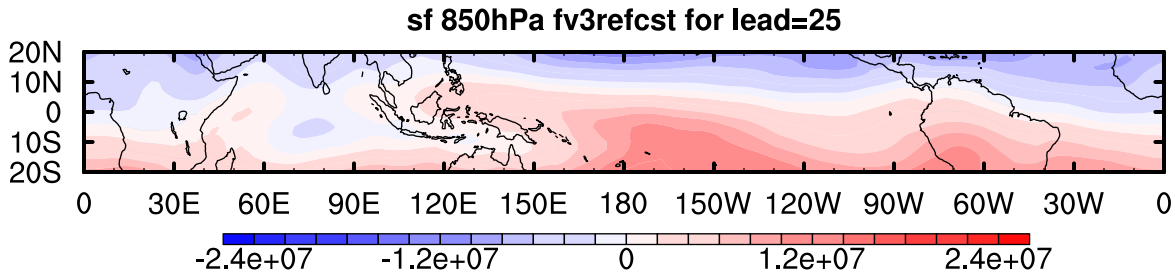
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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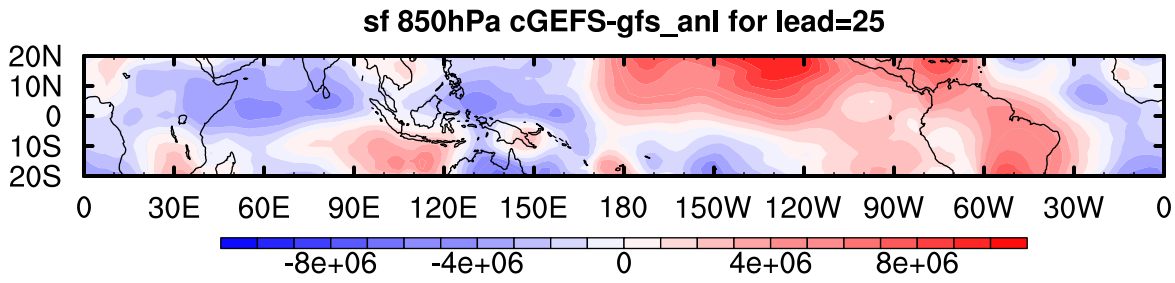
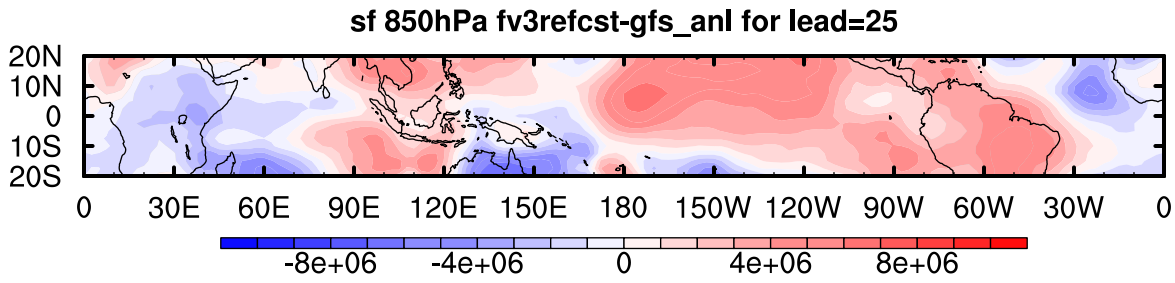
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
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120W
90W
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30W
0
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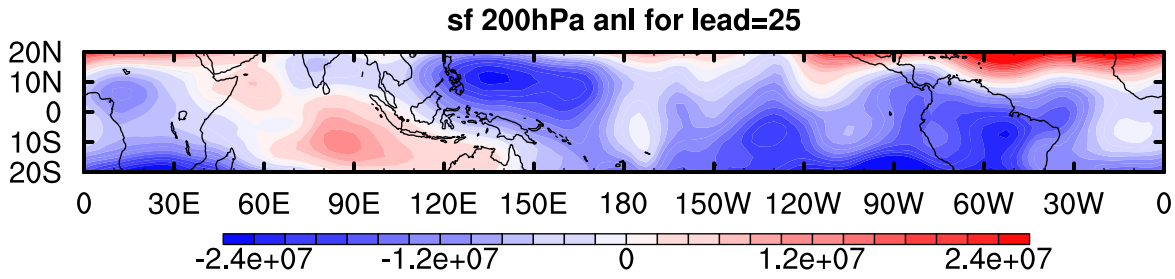
-4e+06
0
4e+06
8e+06


sf 200hPa anl for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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30W
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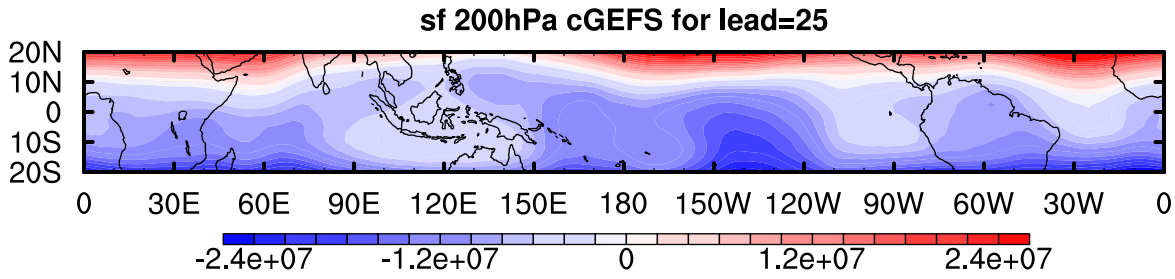
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
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30W
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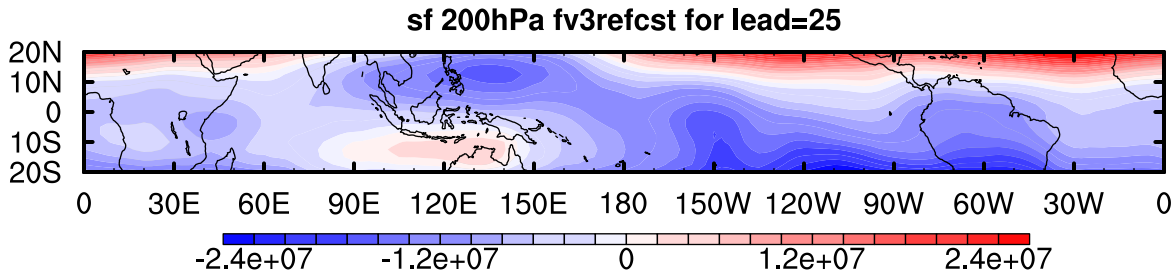
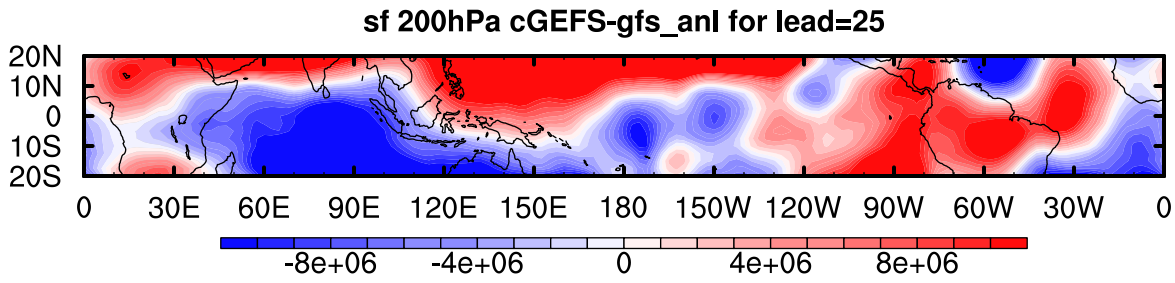
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
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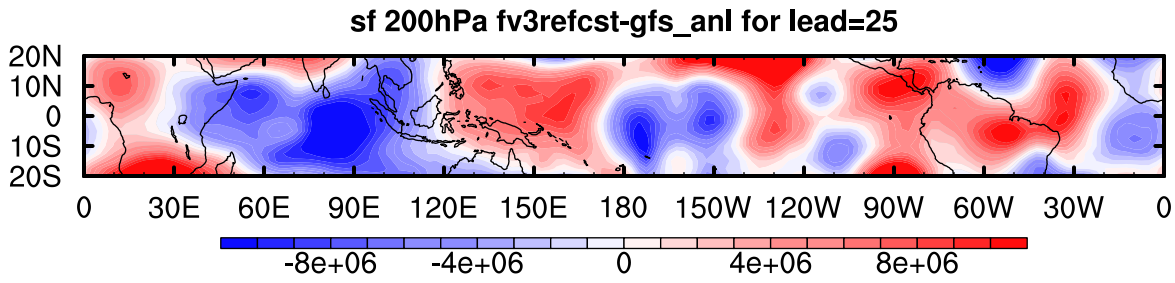
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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90W
60W
30W
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-4e+06
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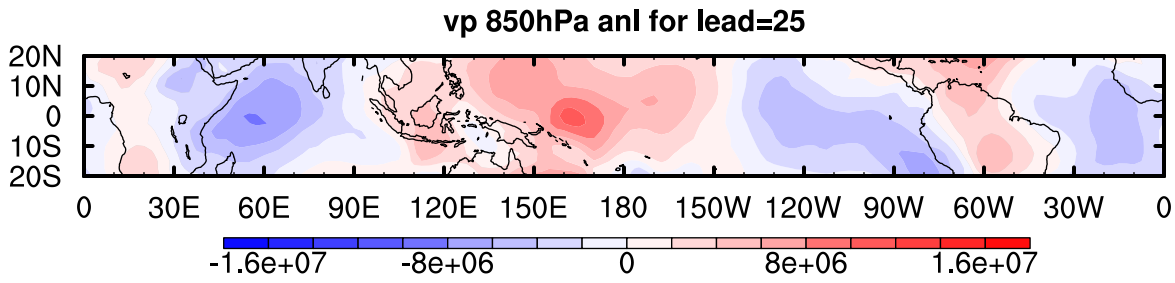
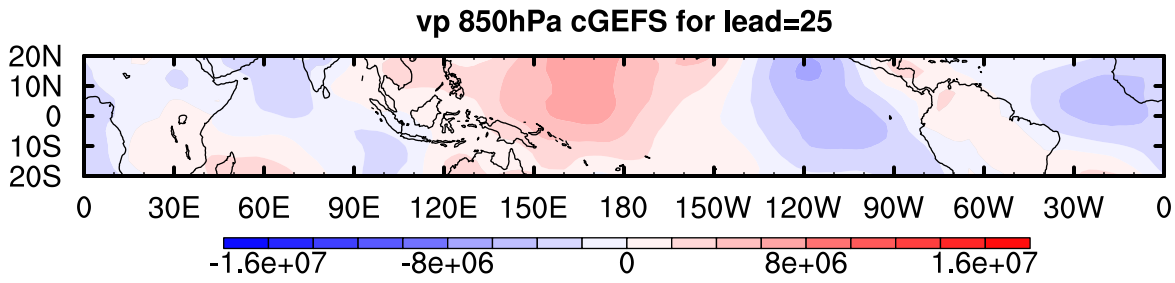
8e+06


vp 850hPa anl for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=25
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10N
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10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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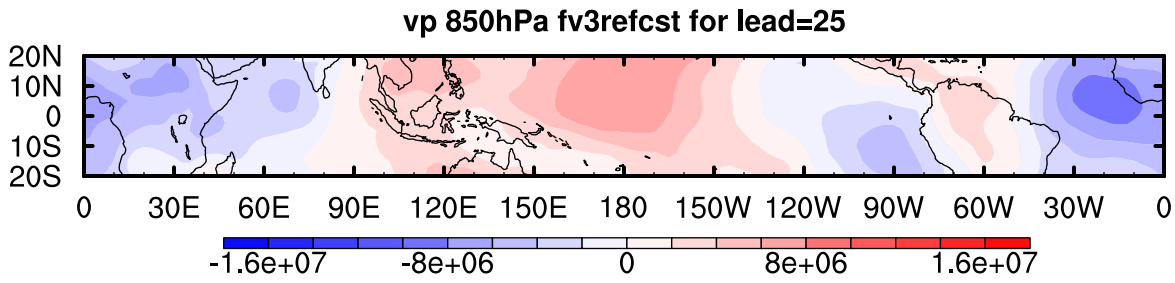
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=25
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10N
0
10S
20S
0
30E
60E
90E
120E
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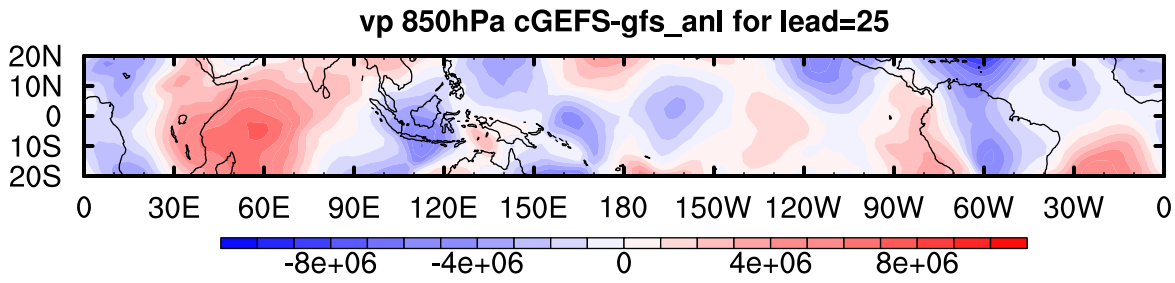
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=25
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10N
0
10S
20S
0
30E
60E
90E
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180
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120W
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60W
30W
0
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-4e+06
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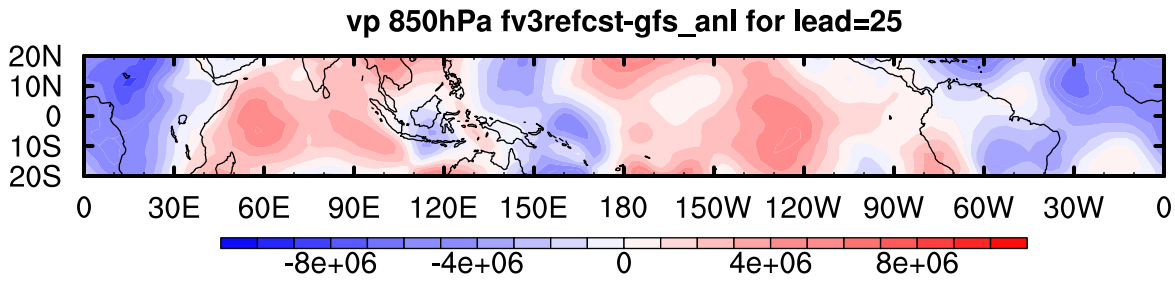
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=25
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10N
0
10S
20S
0
30E
60E
90E
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150E
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90W
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30W
0
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-4e+06
0
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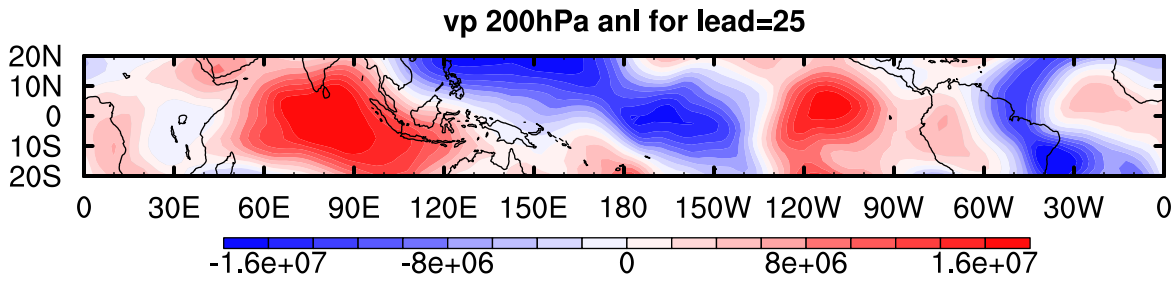
8e+06


vp 200hPa anl for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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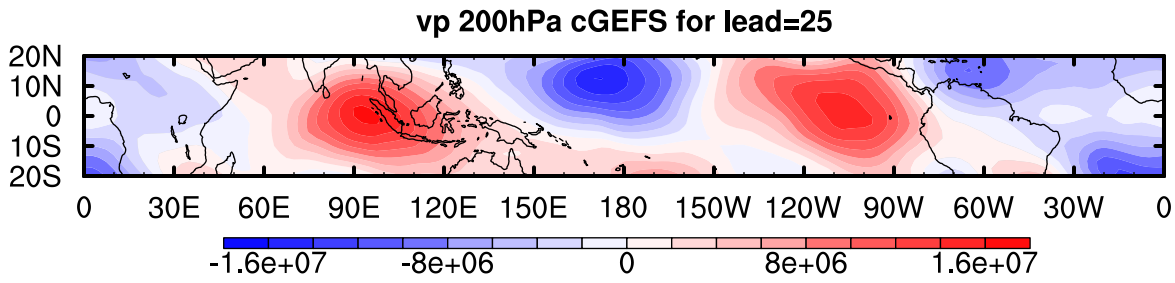
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa cGEFS for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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60W
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-1.6e+07
-8e+06
0
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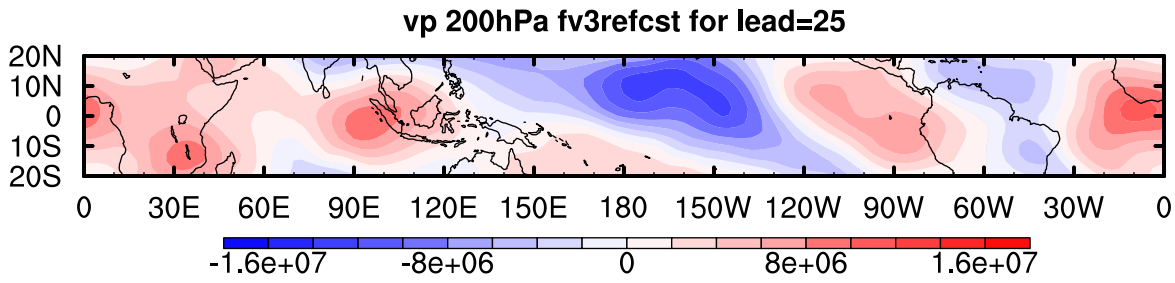
1.6e+07


vp 200hPa fv3refcst for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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60W
30W
0
-1.6e+07
-8e+06
0
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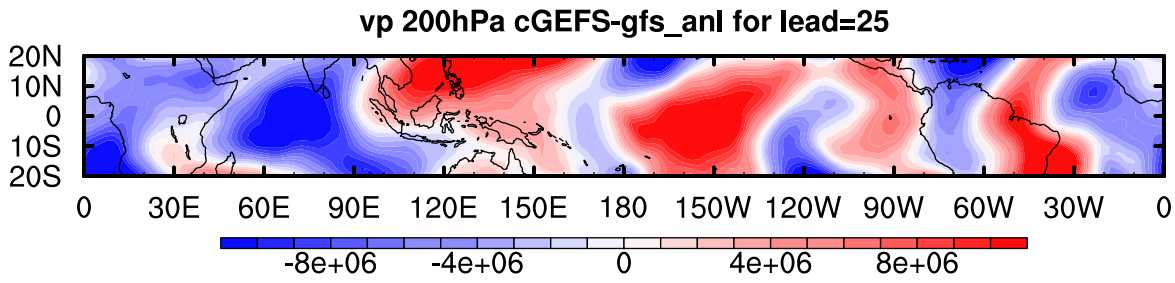
1.6e+07


vp 200hPa cGEFS-gfs_anl for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
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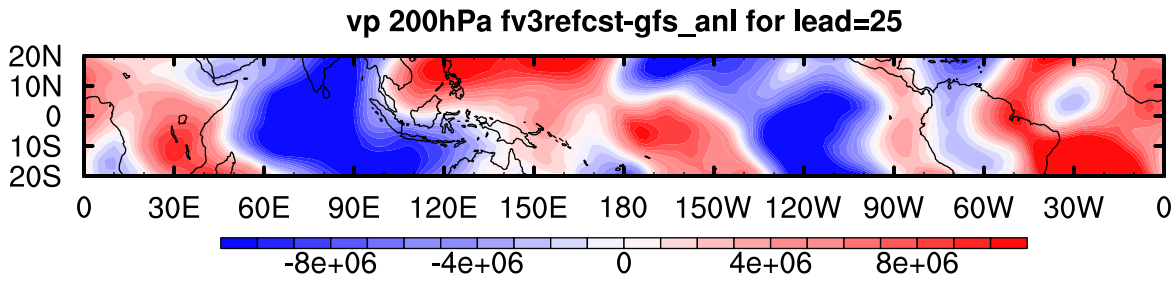
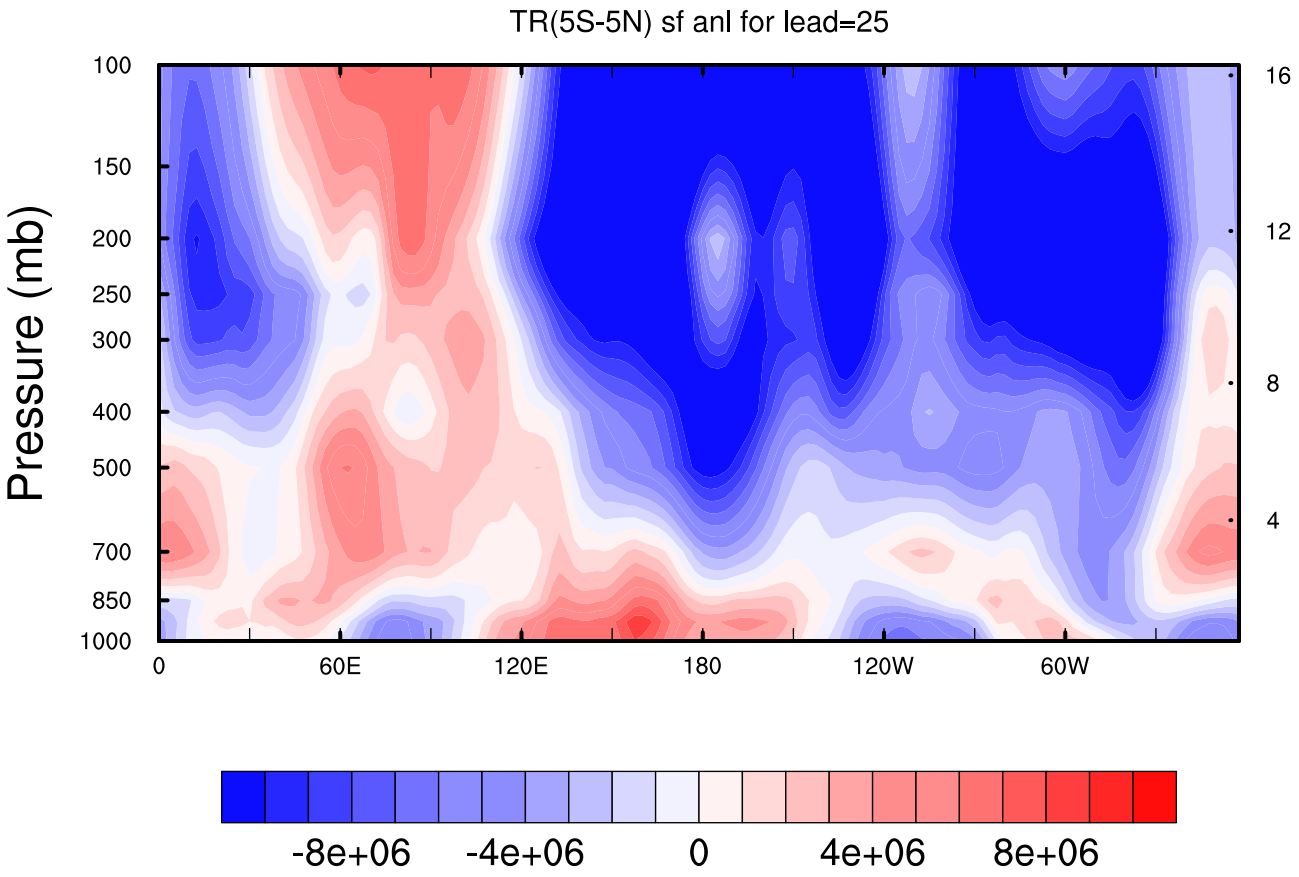
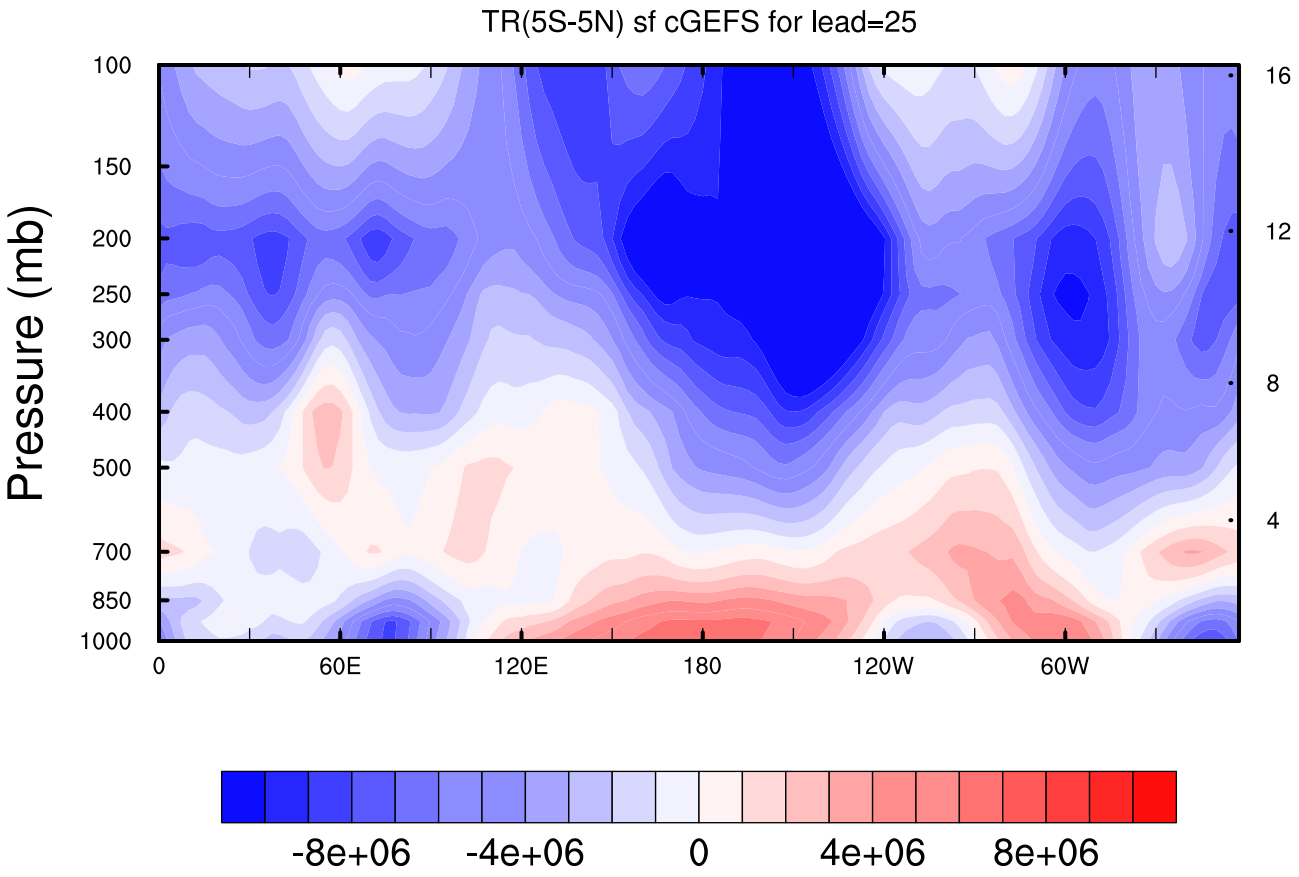
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 200hPa fv3refcst-gfs_anl for lead=25
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) sf anl for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) sf cGEFS for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
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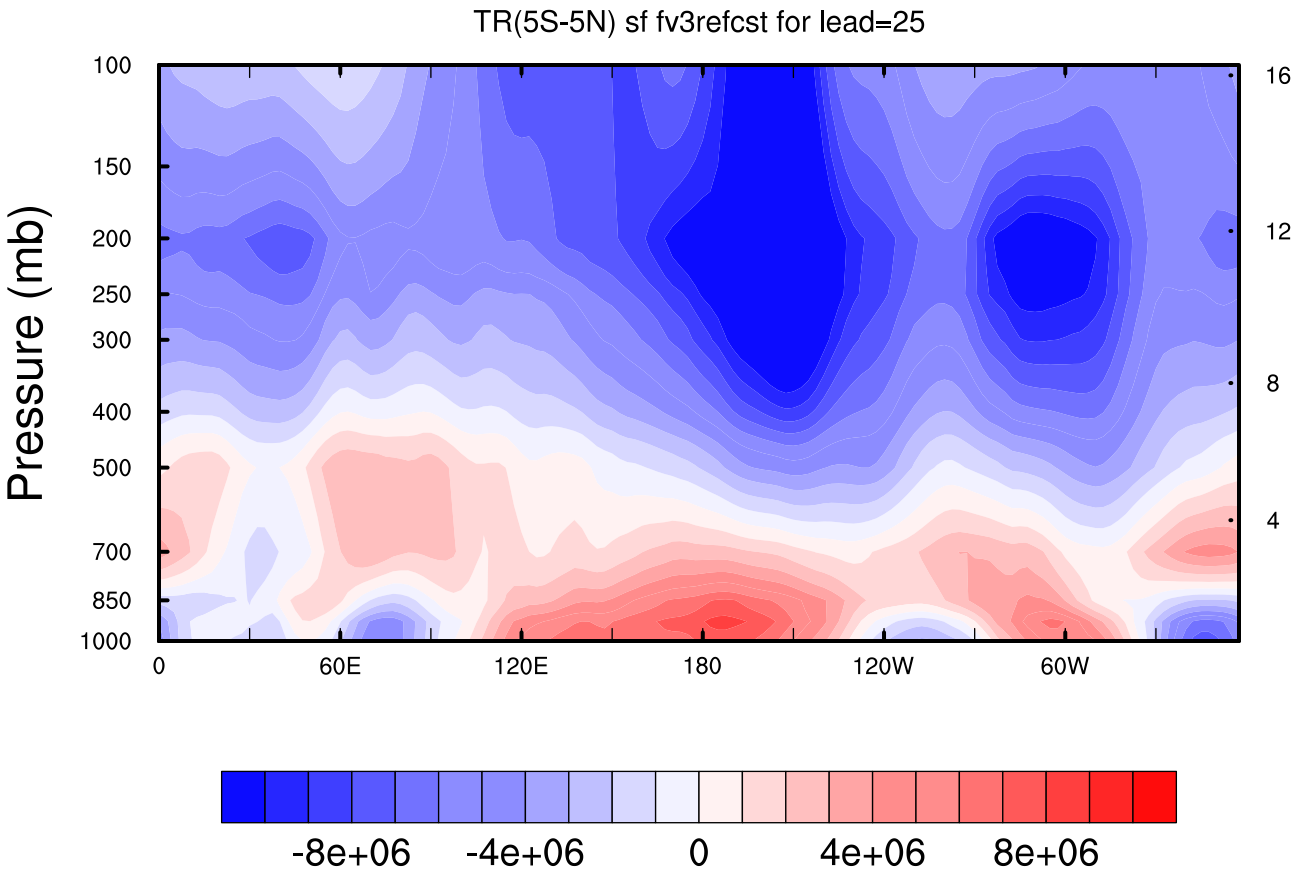
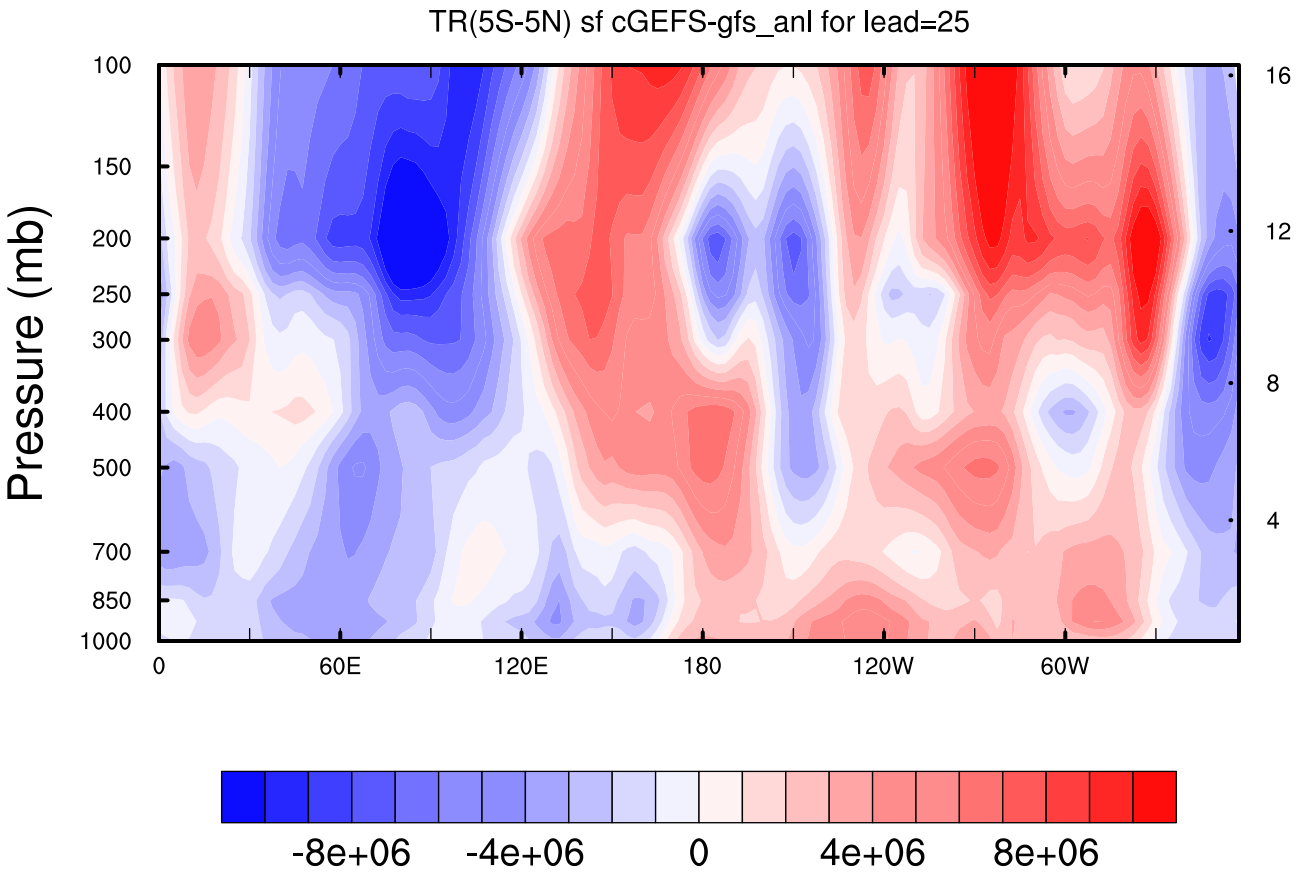
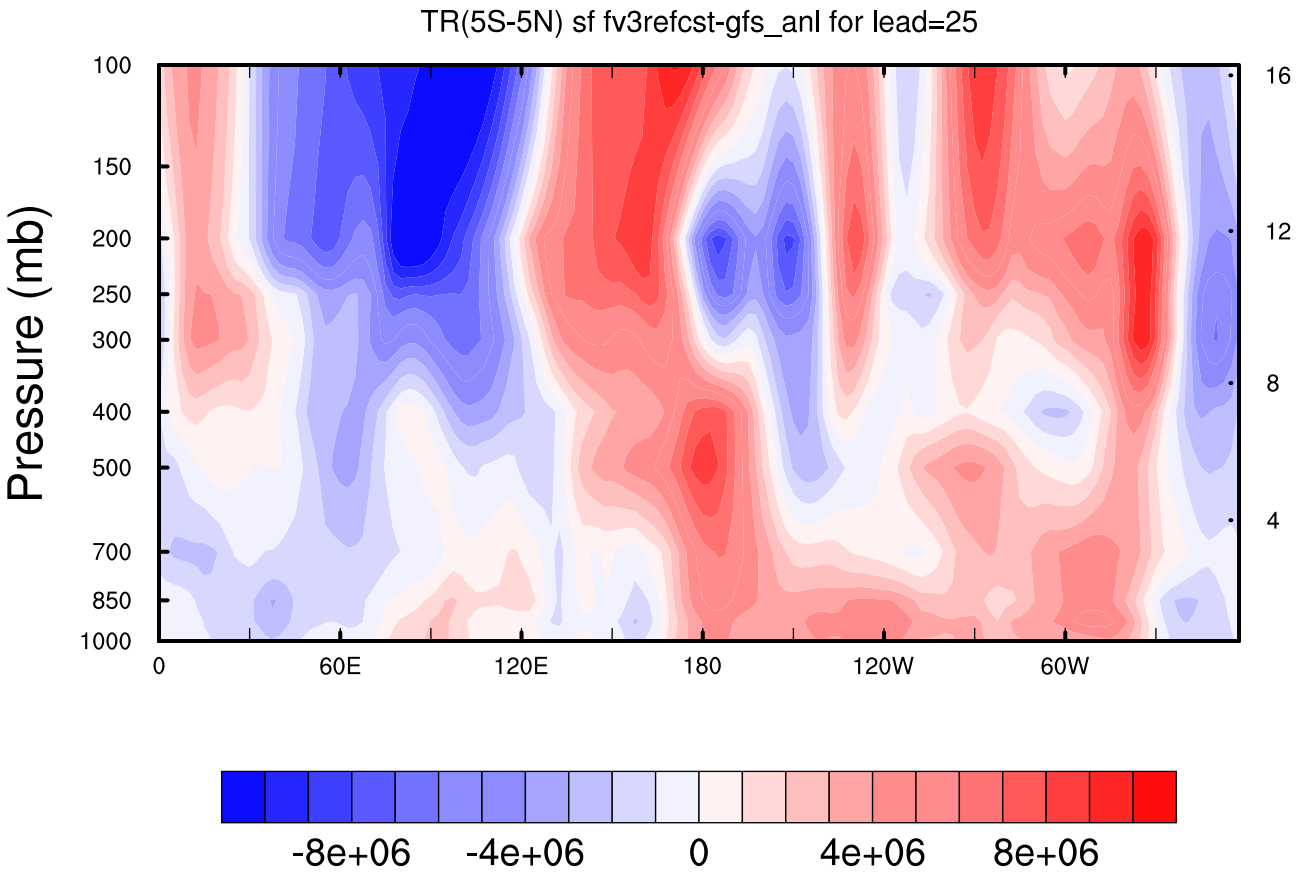
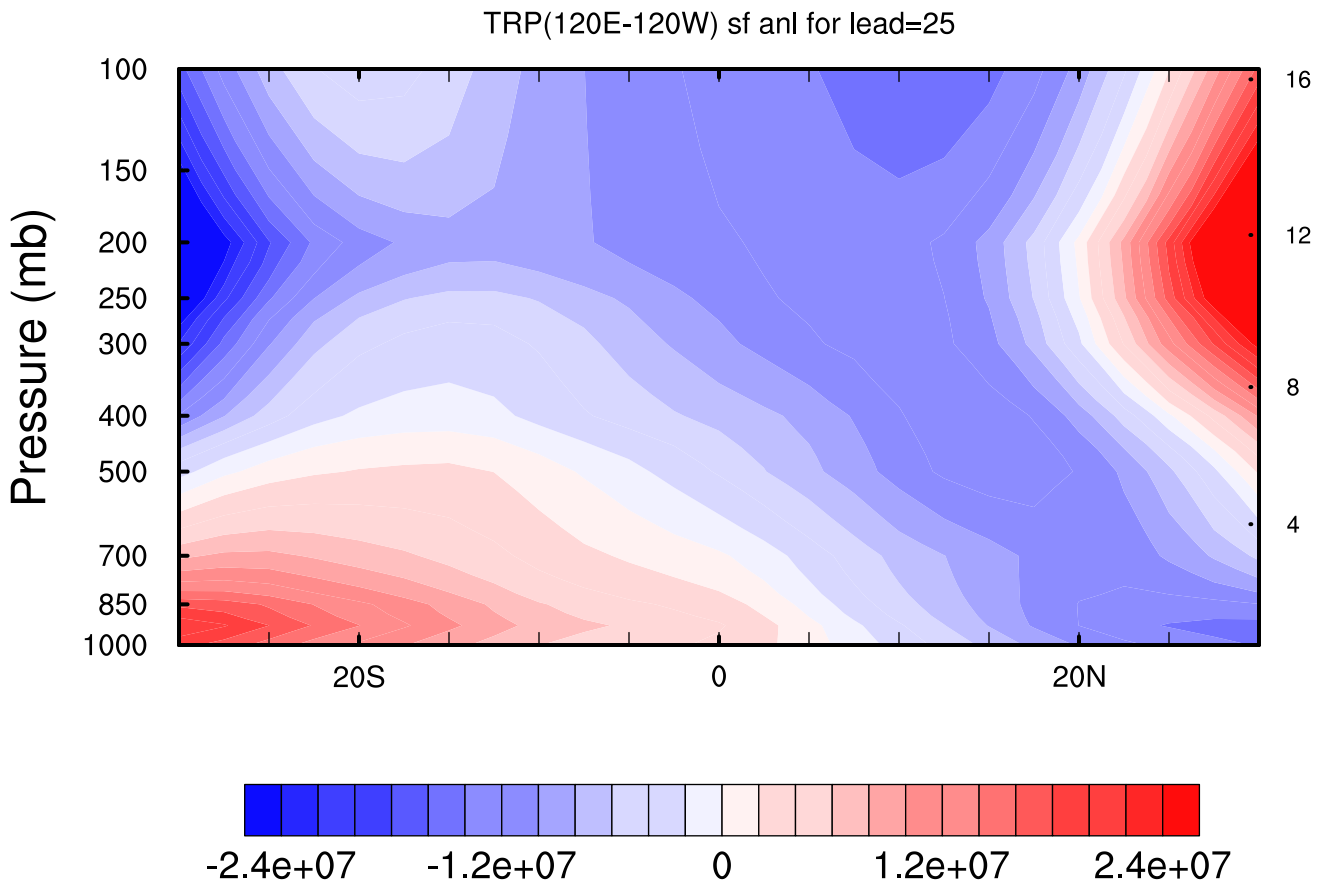
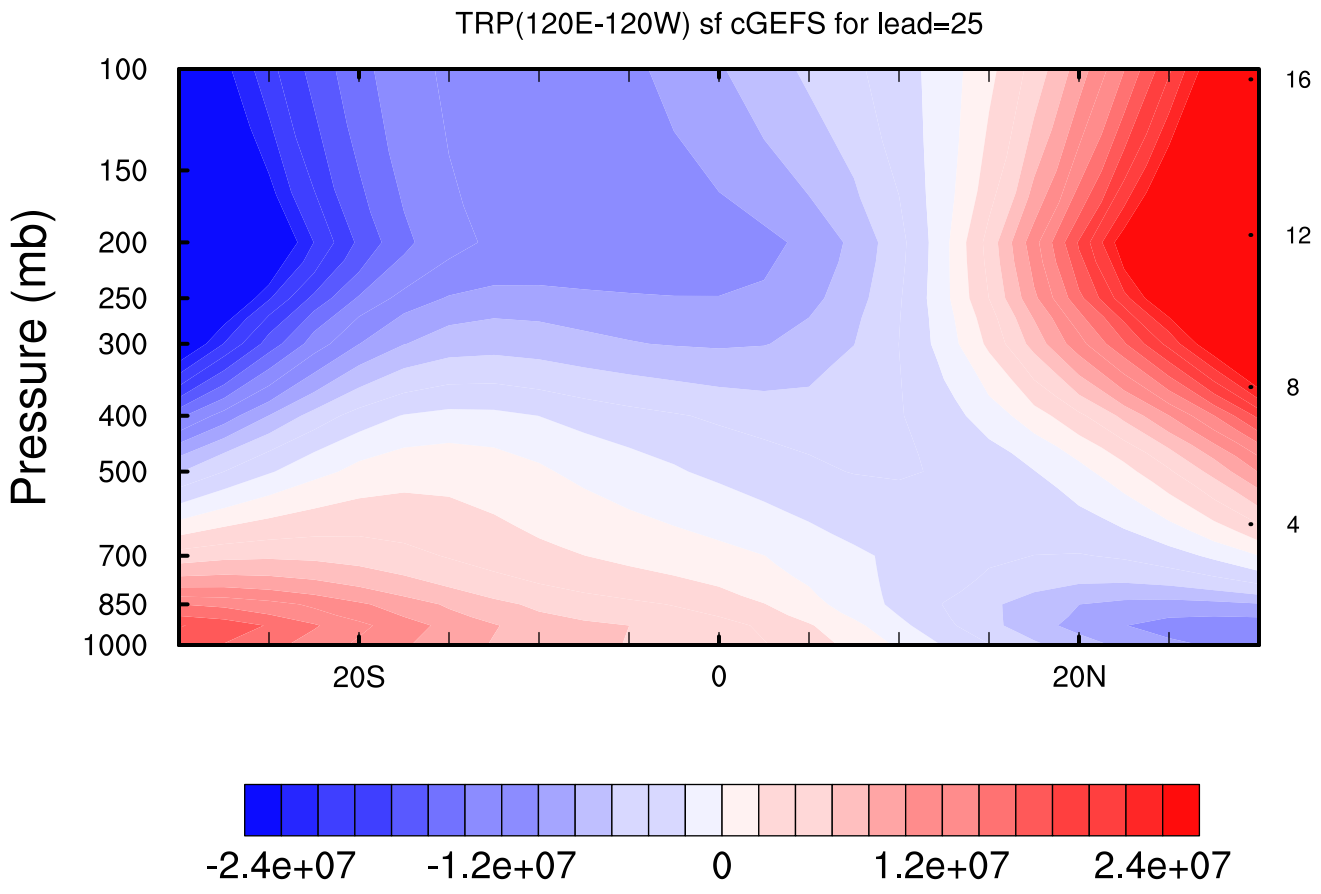
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

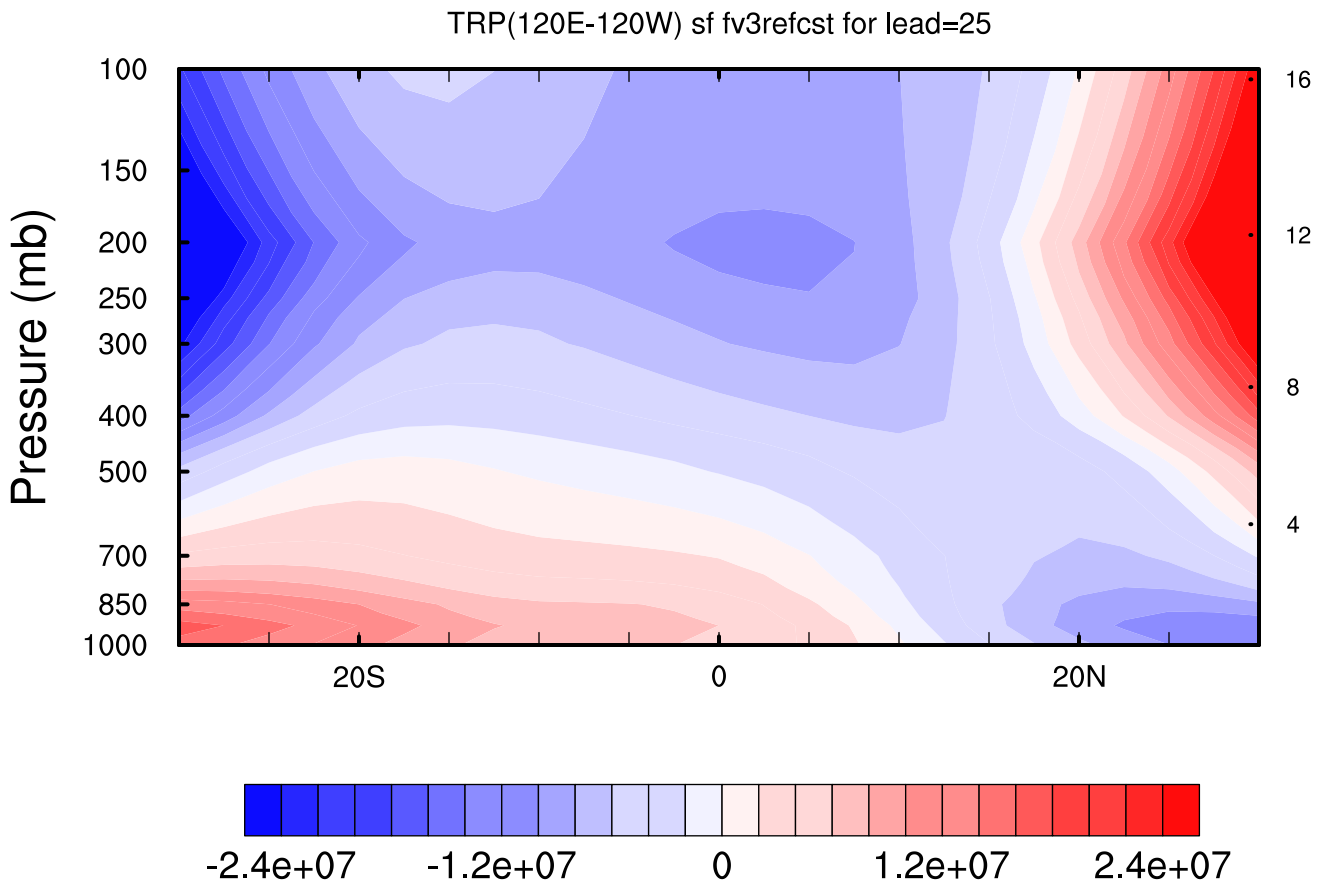

TR(5S-5N) sf fv3refcst for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

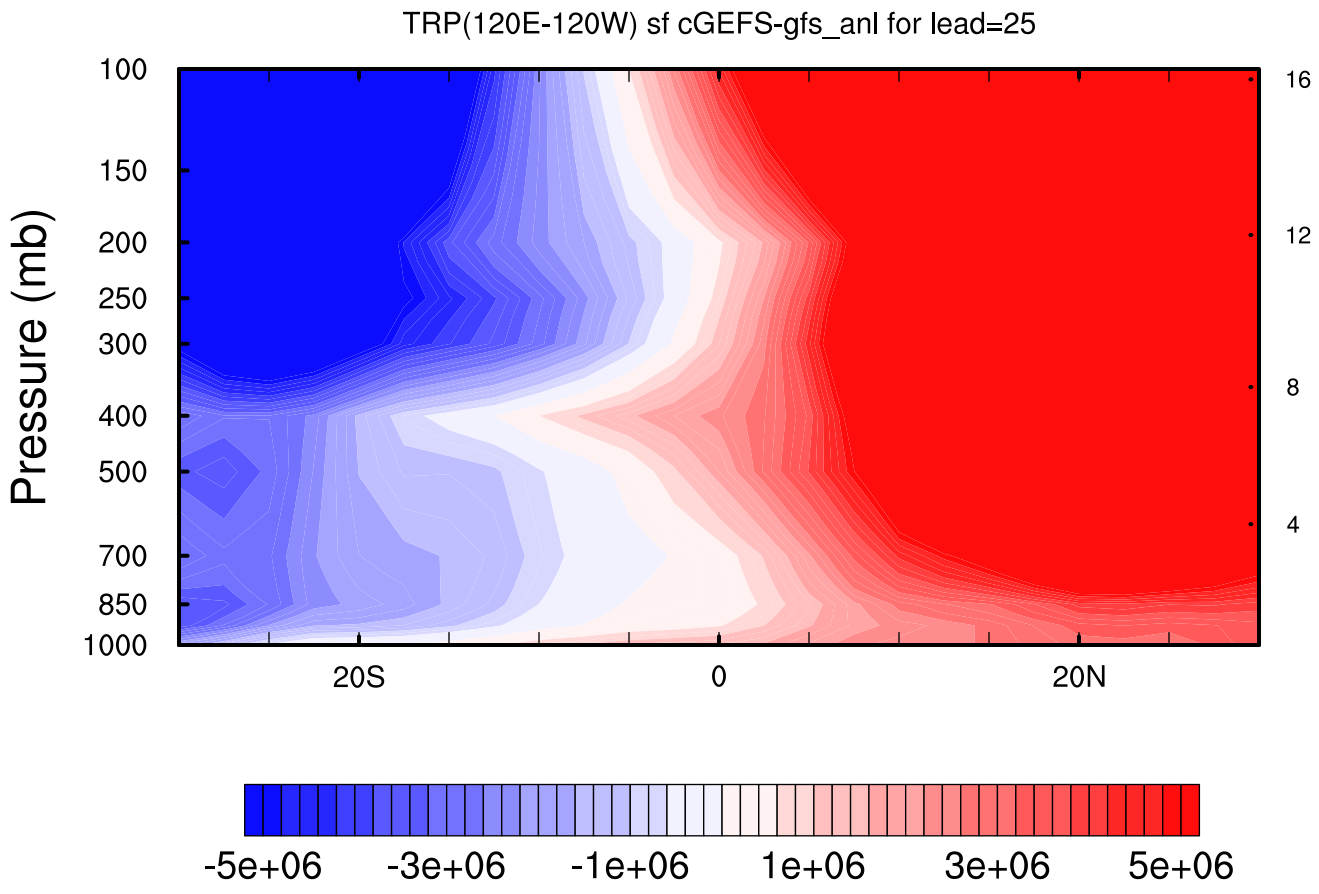

TR(5S-5N) sf cGEFS-gfs_anl for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

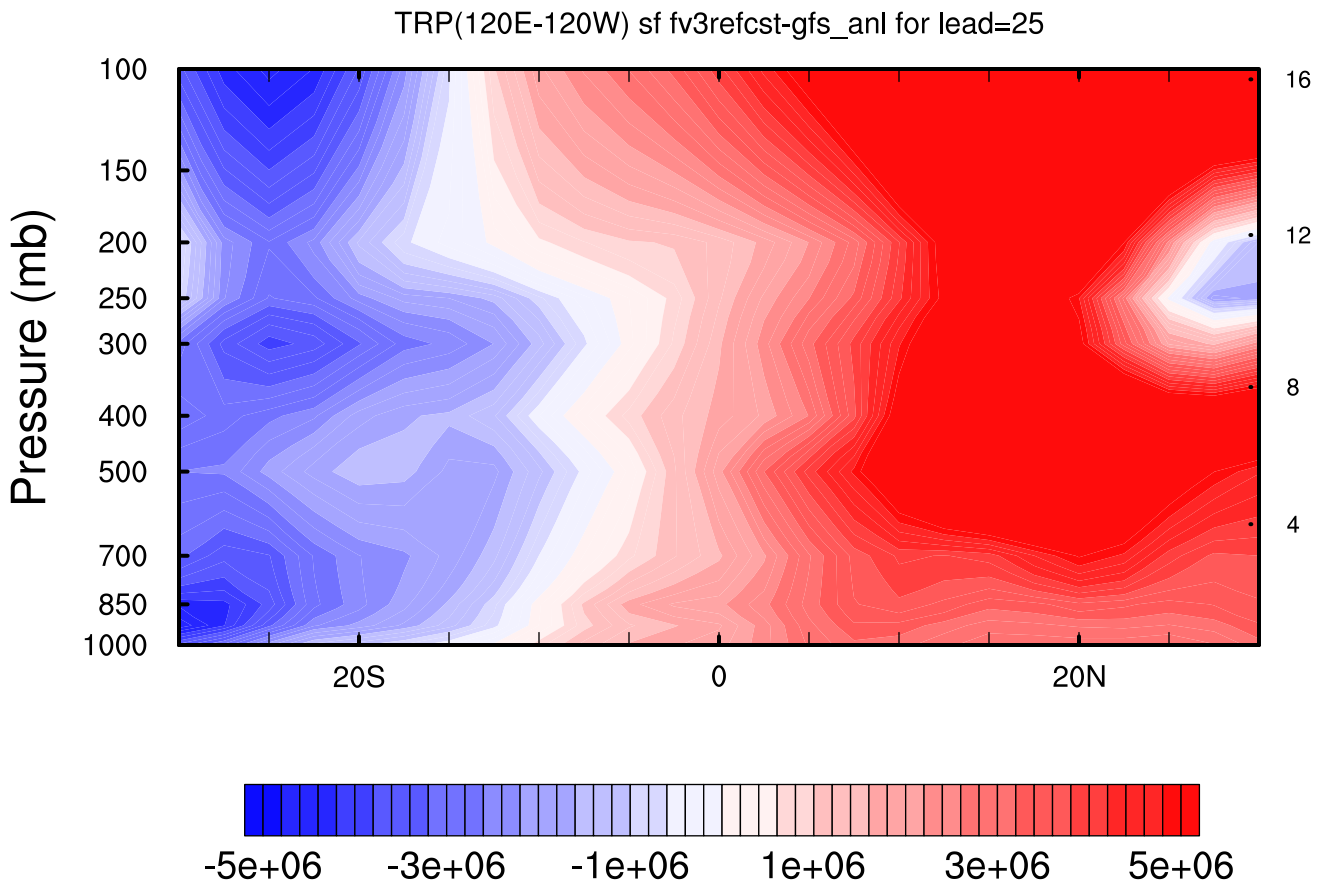

TR(5S-5N) sf fv3refcst-gfs_anl for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

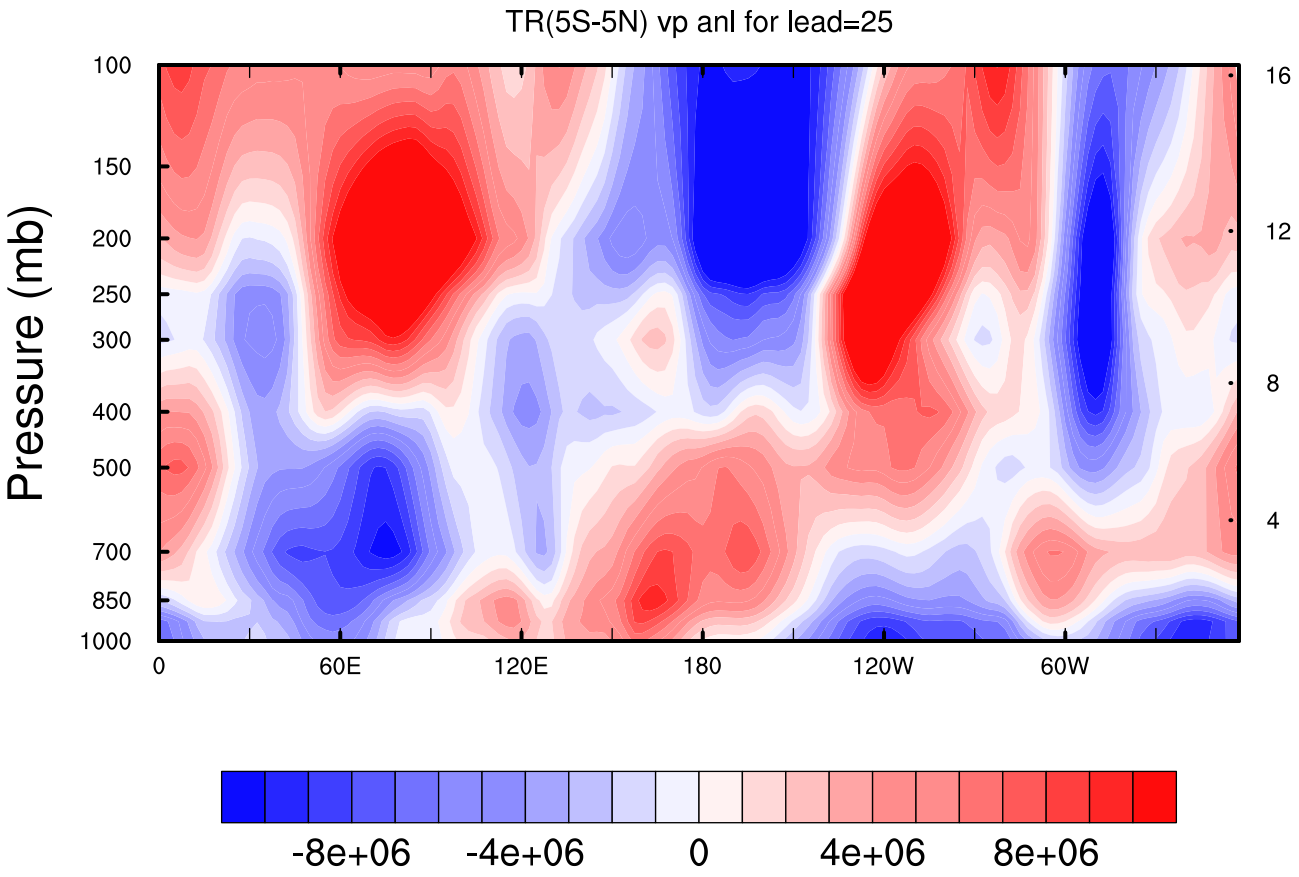

TRP(120E-120W) sf anl for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

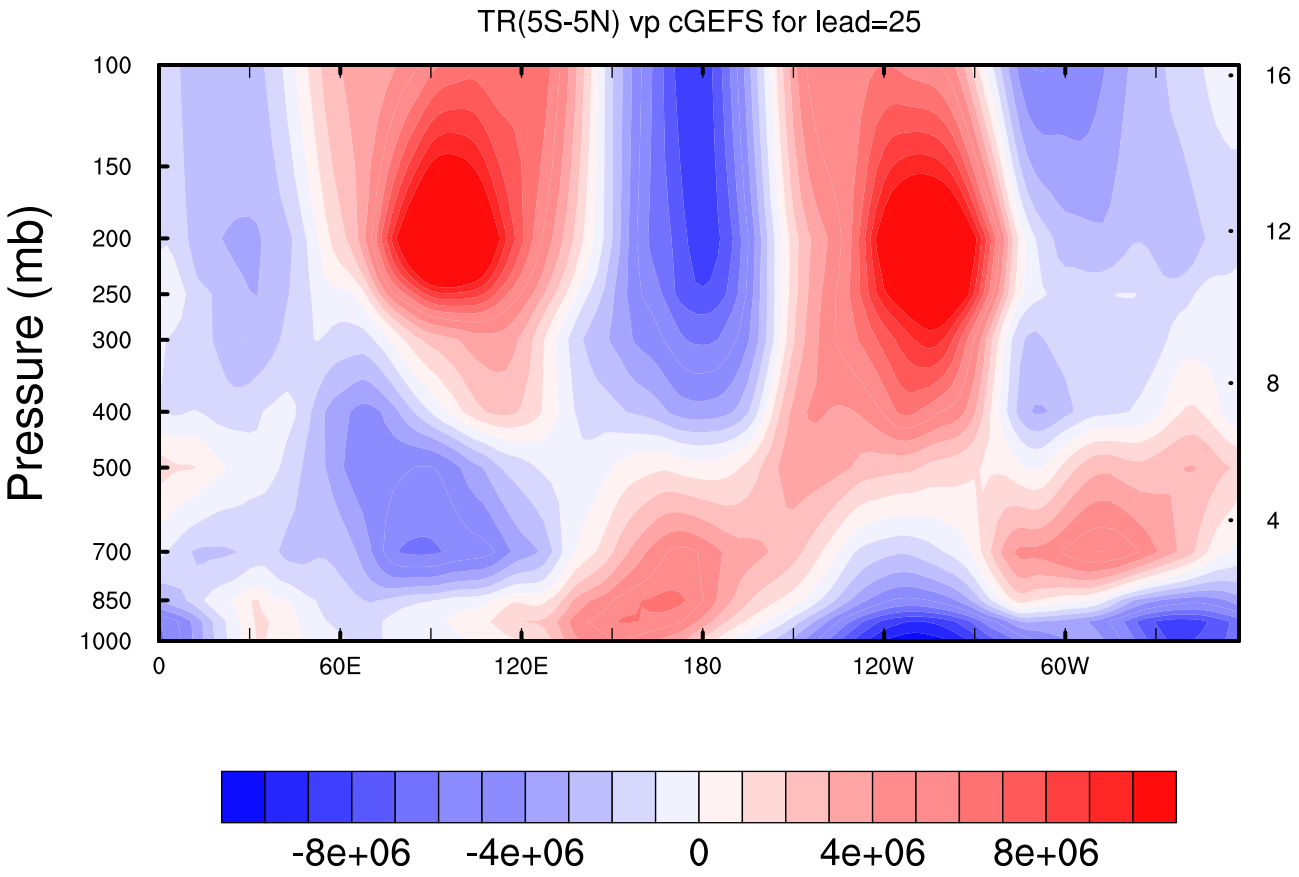

TRP(120E-120W) sf cGEFS for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

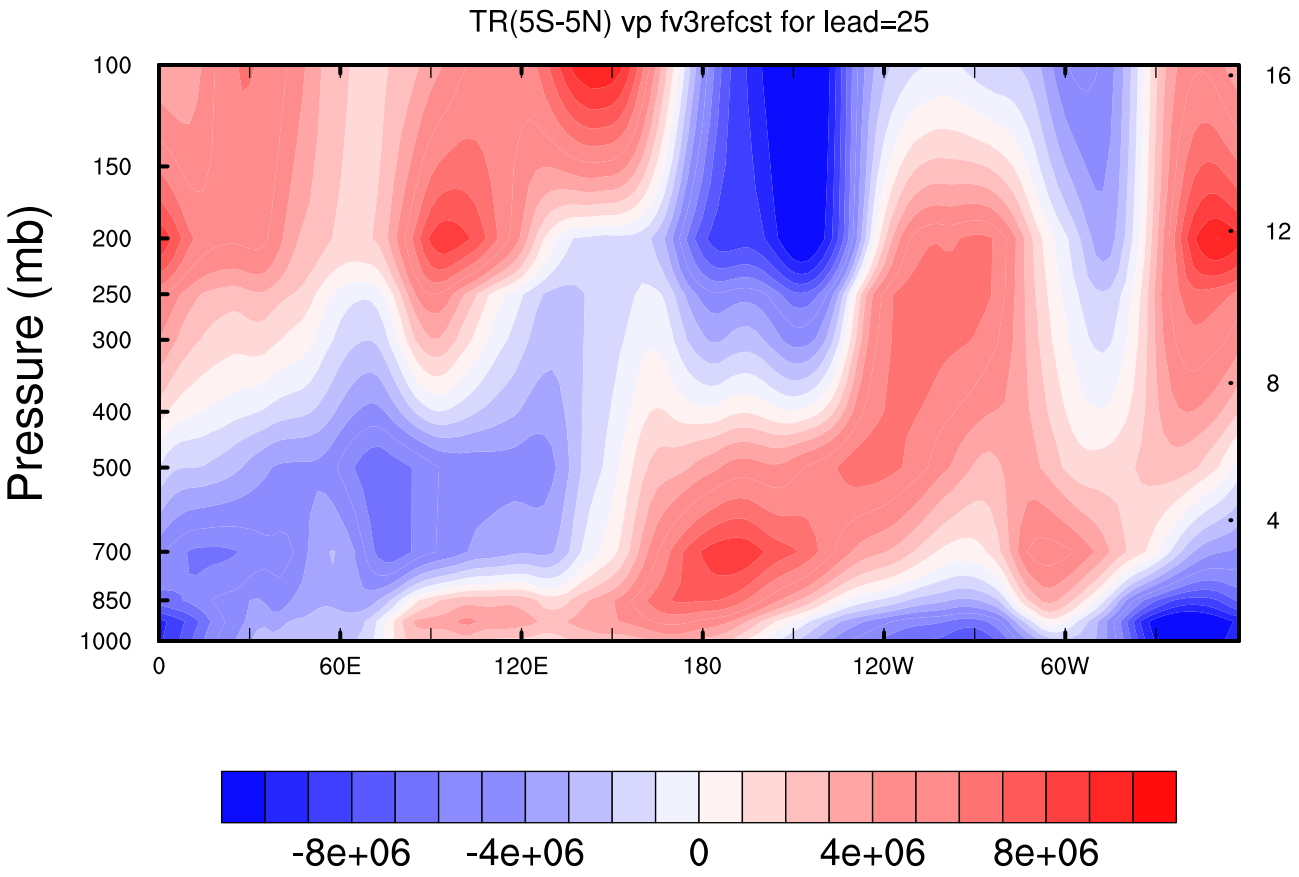

TRP(120E-120W) sf fv3refcst for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

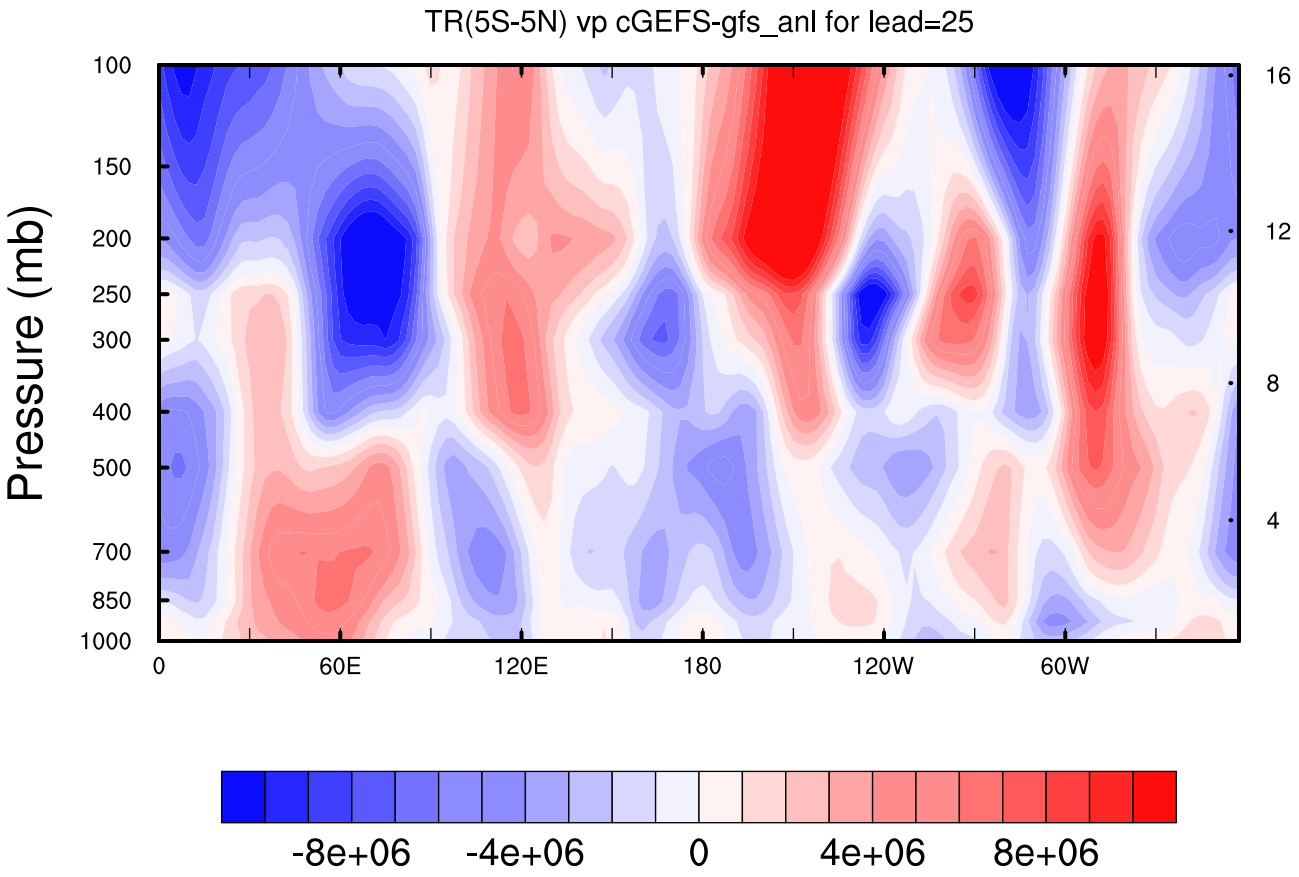

TRP(120E-120W) sf cGEFS-gfs_anl for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

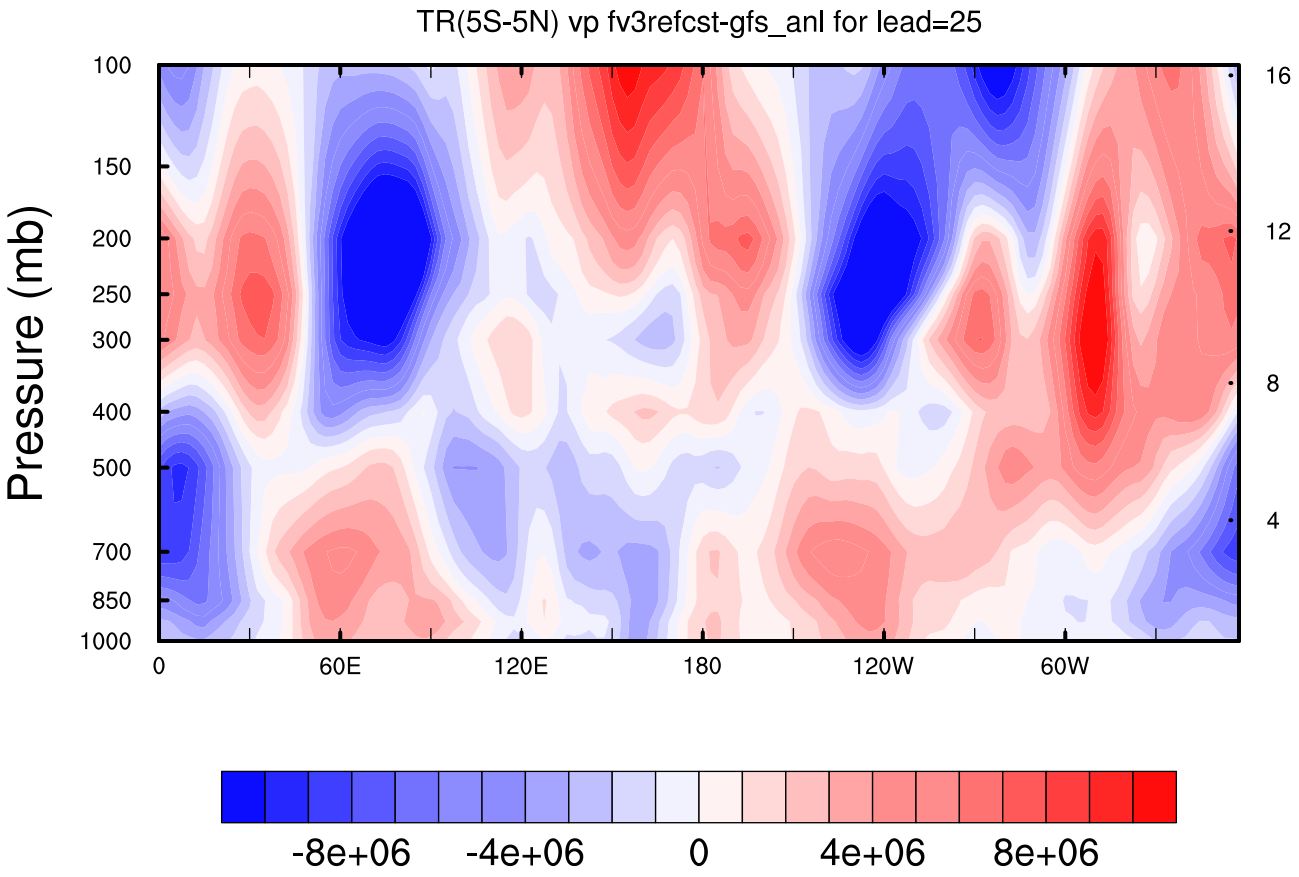

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

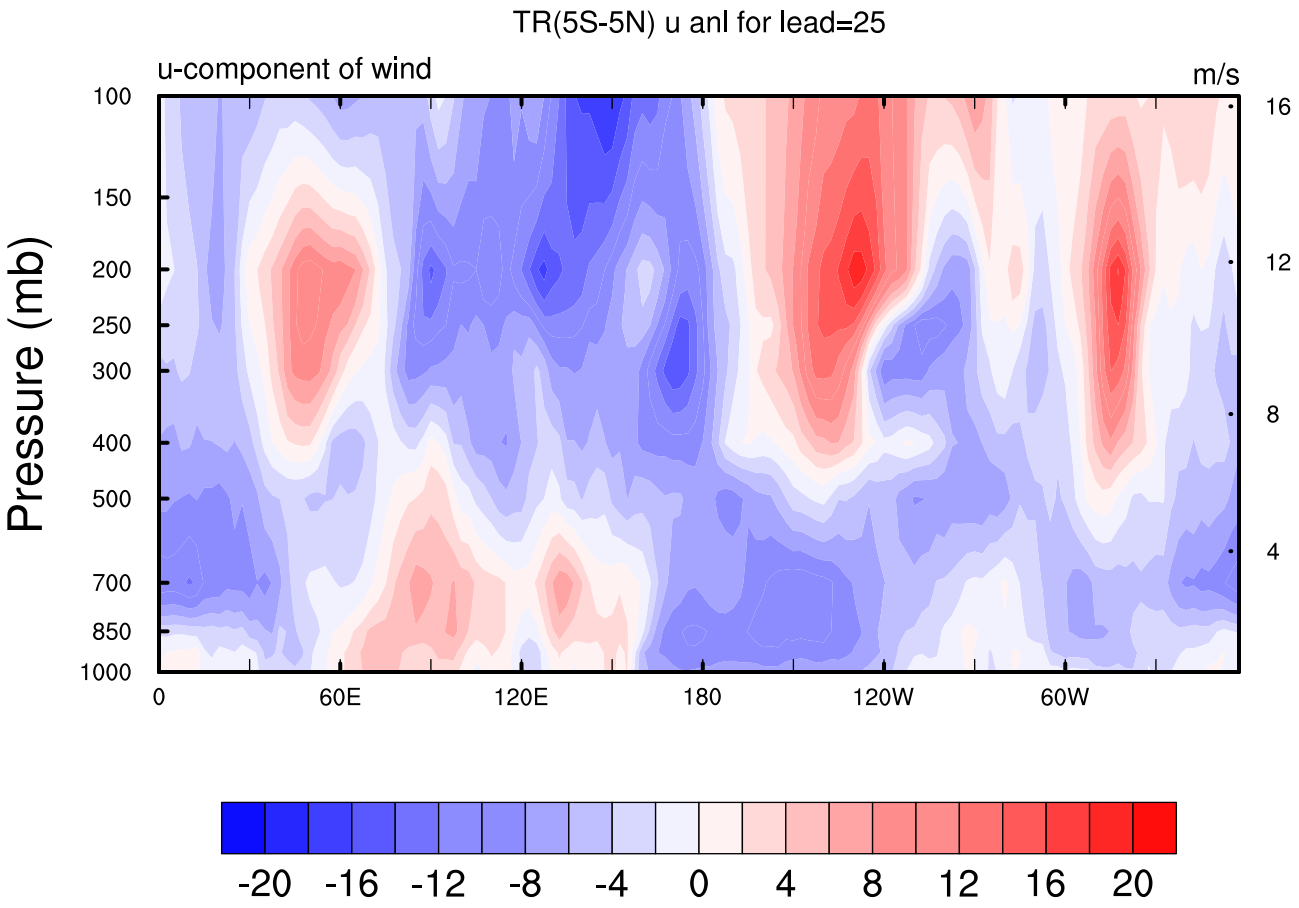

TR(5S-5N) vp anl for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

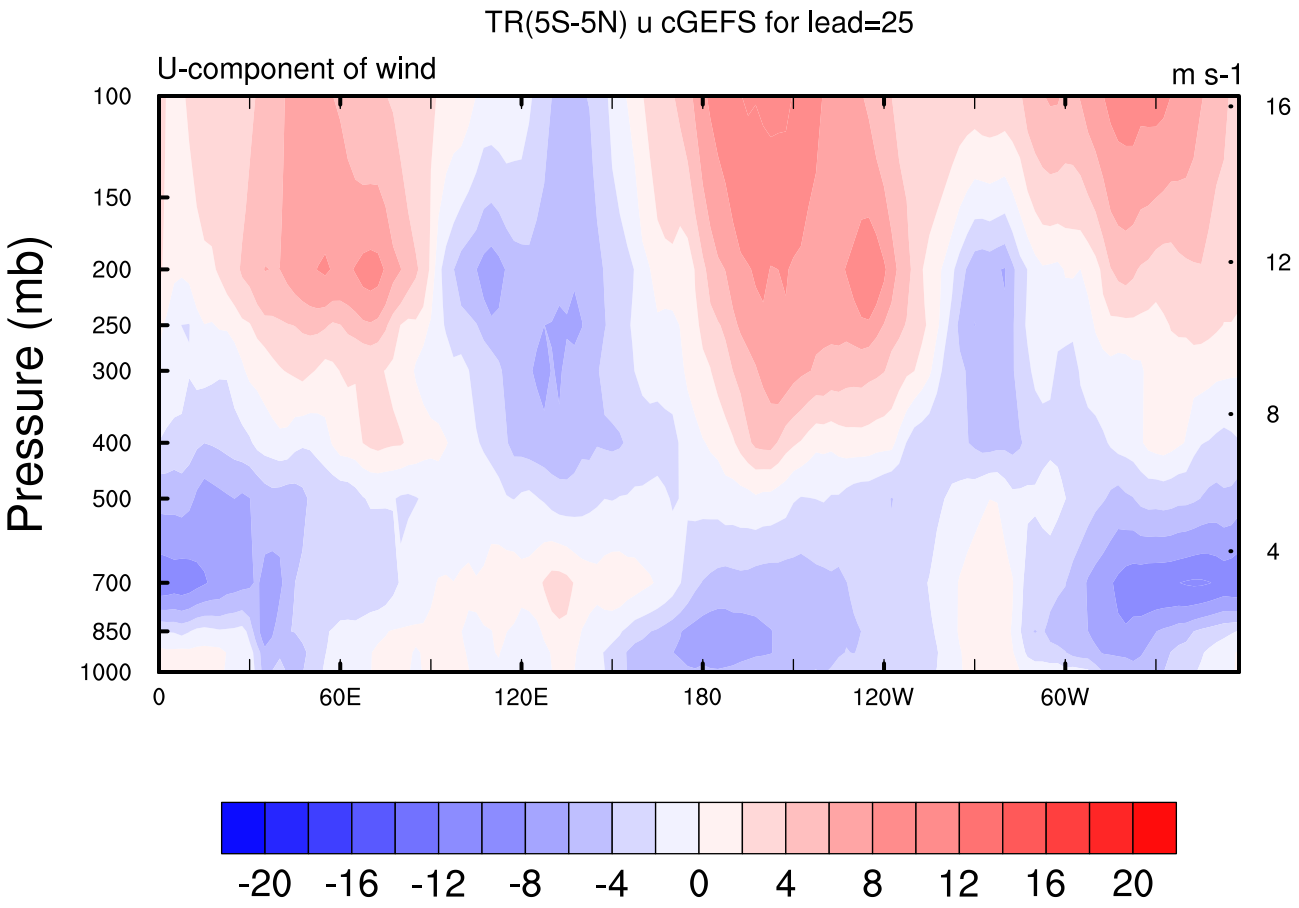

TR(5S-5N) vp cGEFS for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

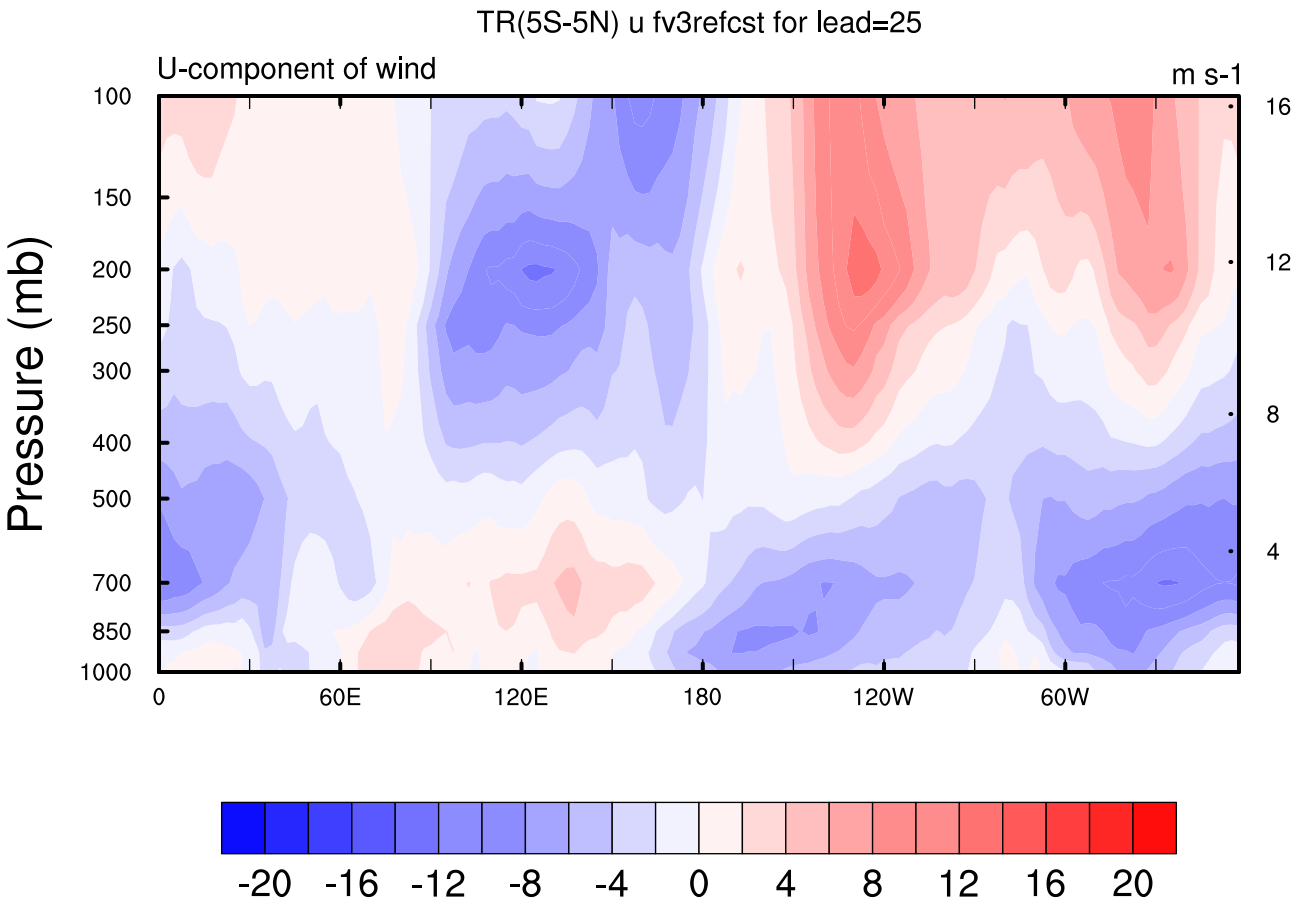

TR(5S-5N) vp fv3refcst for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

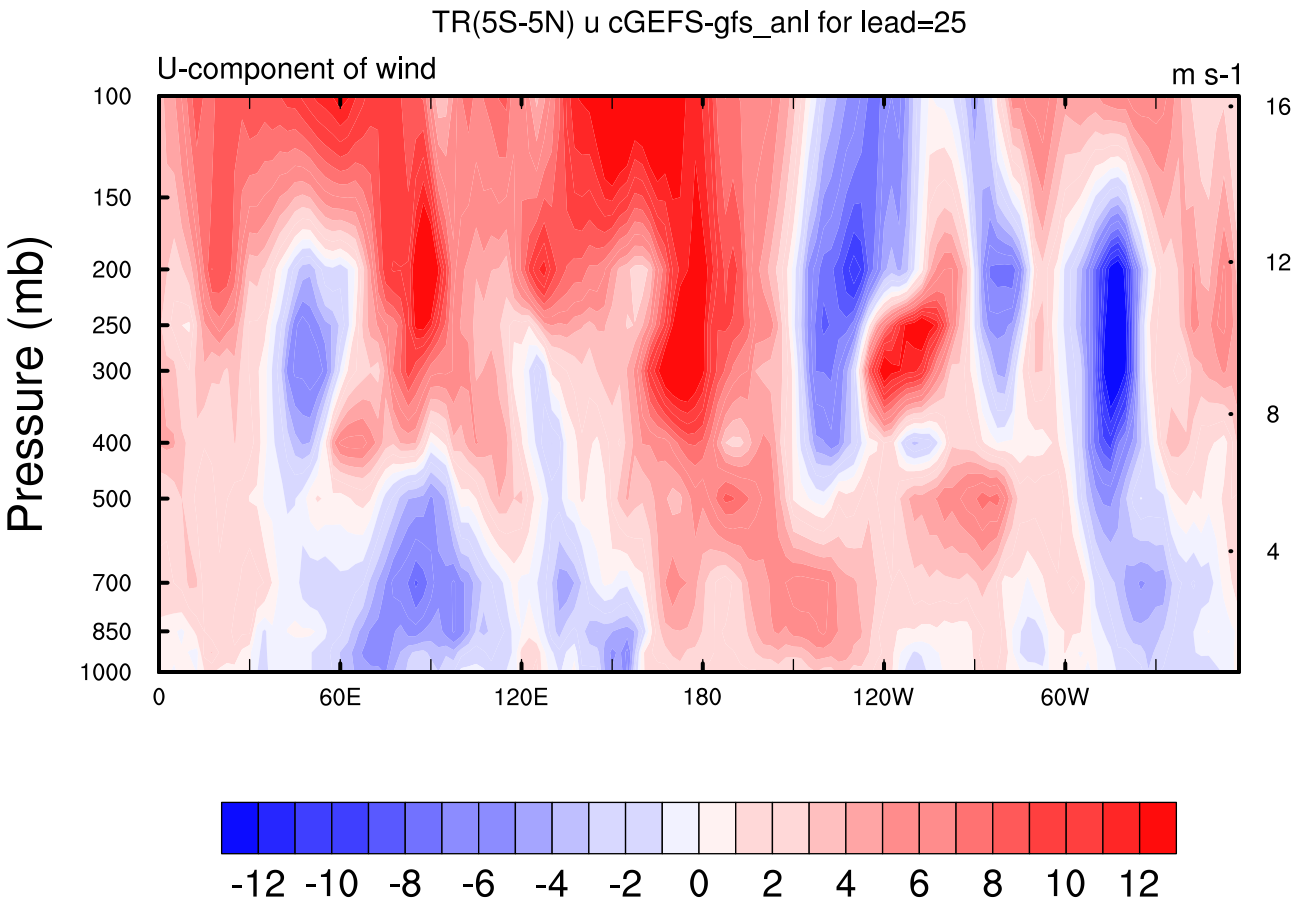

TR(5S-5N) vp cGEFS-gfs_anl for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

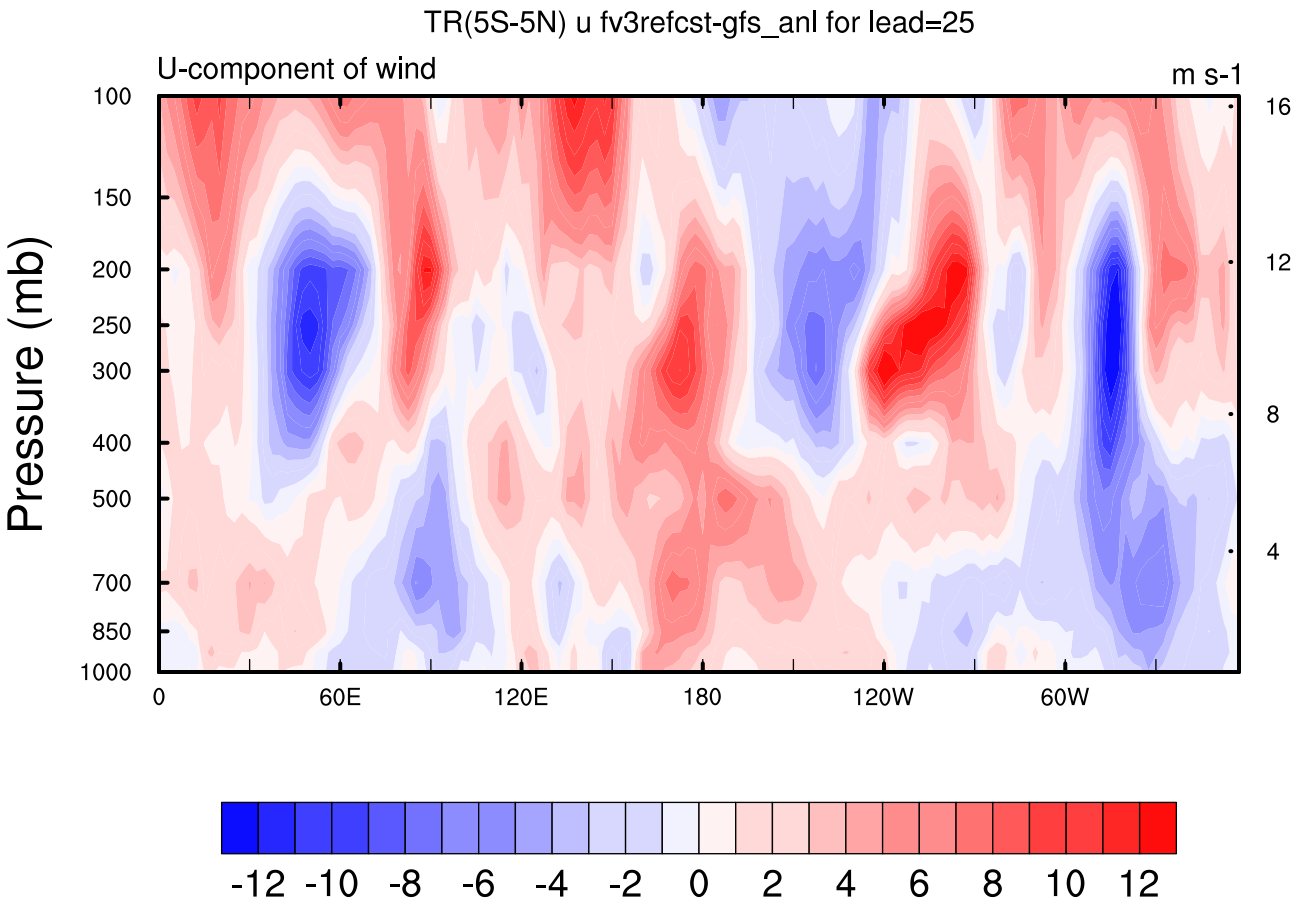

TR(5S-5N) vp fv3refcst-gfs_anl for lead=25
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

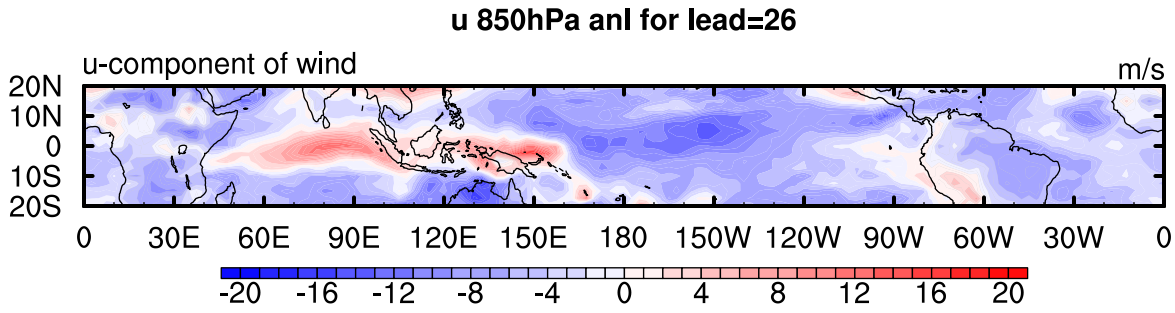

TR(5S-5N) u anl for lead=25
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

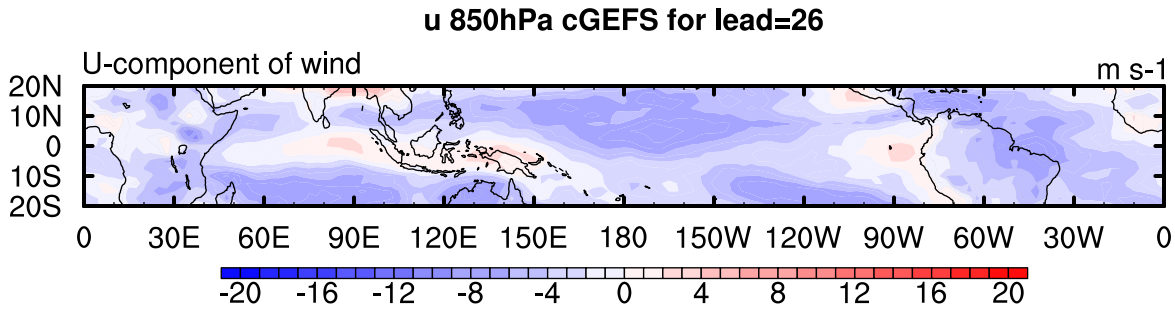

TR(5S-5N) u cGEFS for lead=25
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

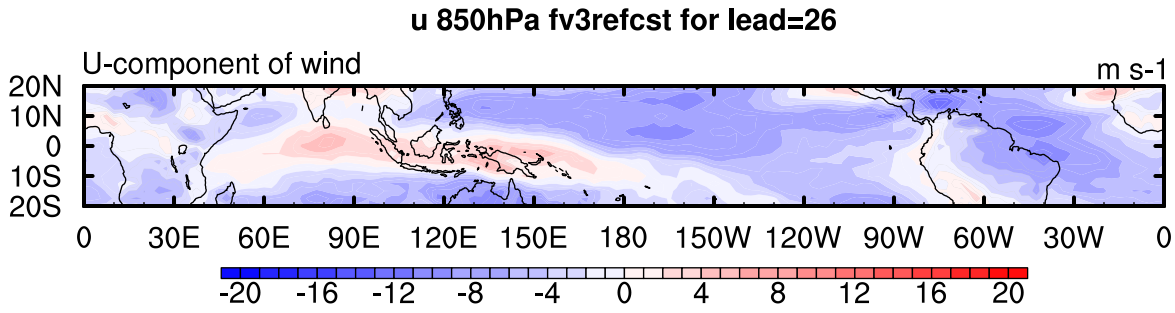

TR(5S-5N) u fv3refcst for lead=25
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

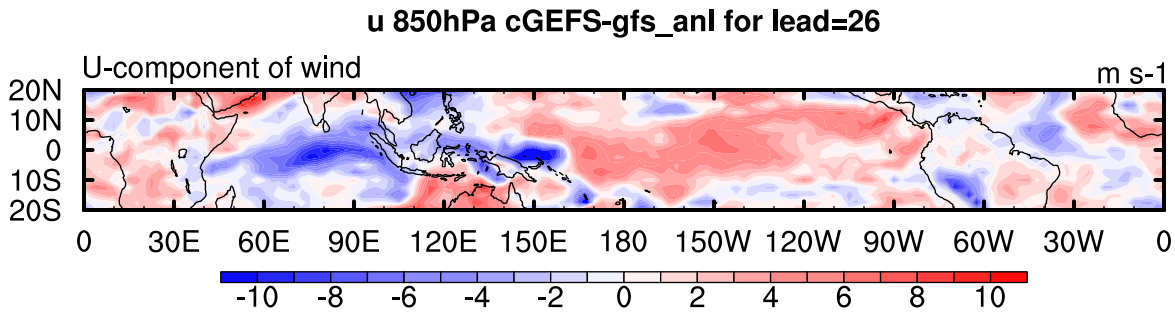

TR(5S-5N) u cGEFS-gfs_anl for lead=25
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

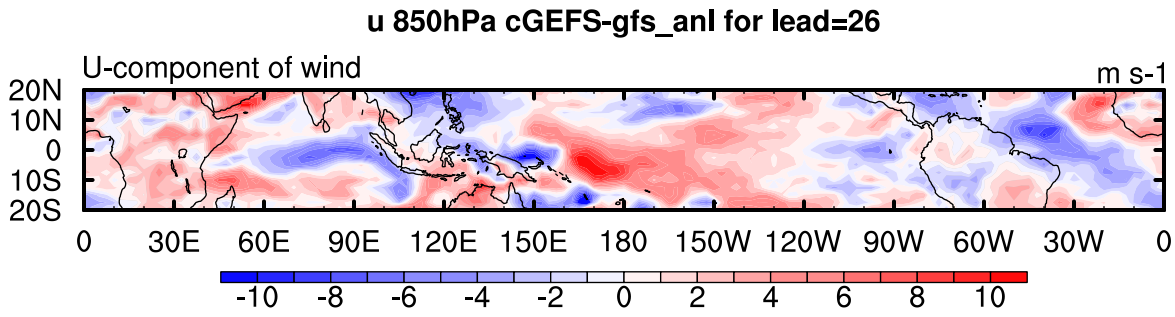

TR(5S-5N) u fv3refcst-gfs_anl for lead=25
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

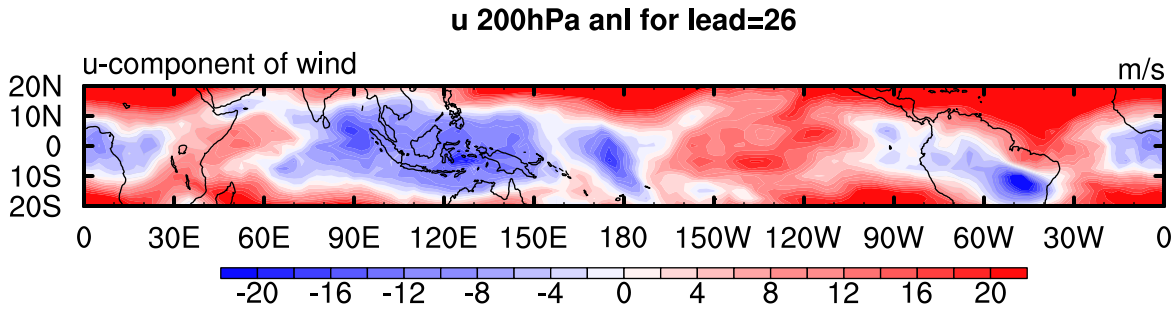

u 850hPa anl for lead=26
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

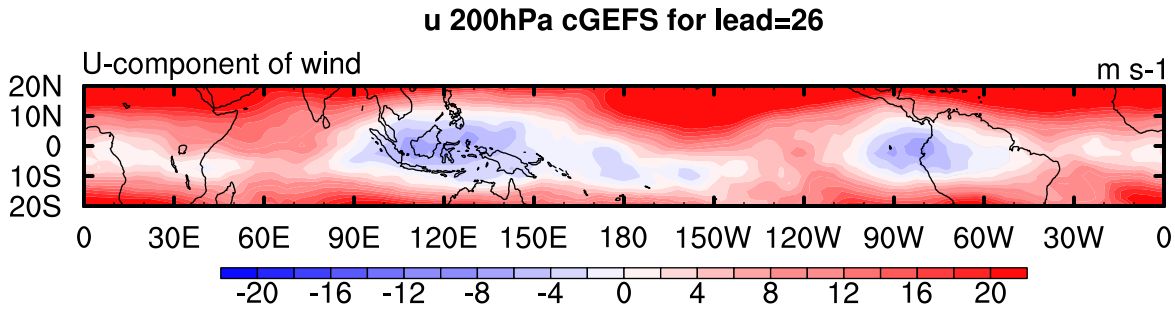

u 850hPa cGEFS for lead=26
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

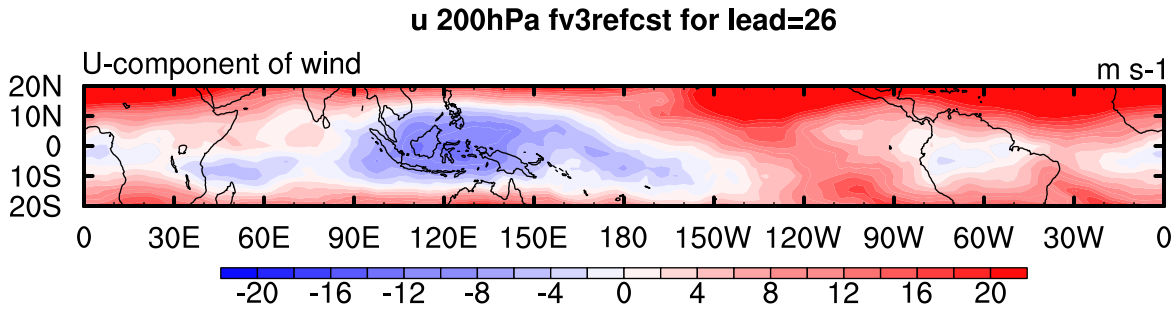

u 850hPa fv3refcst for lead=26
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

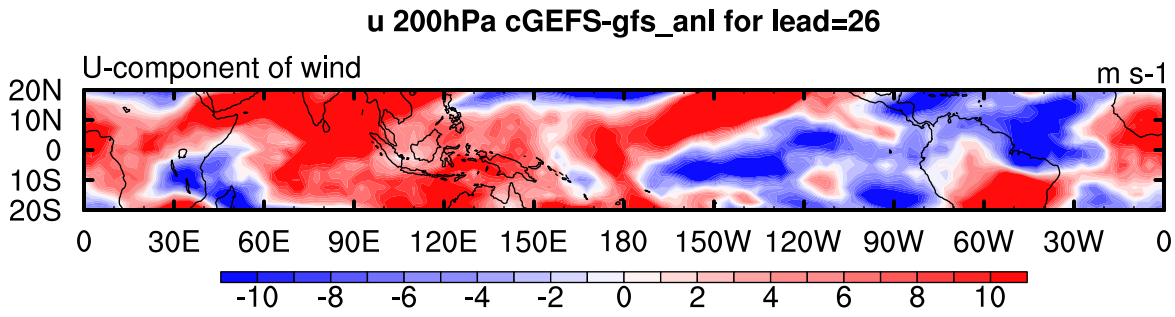

u 850hPa cGEFS-gfs_anl for lead=26
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

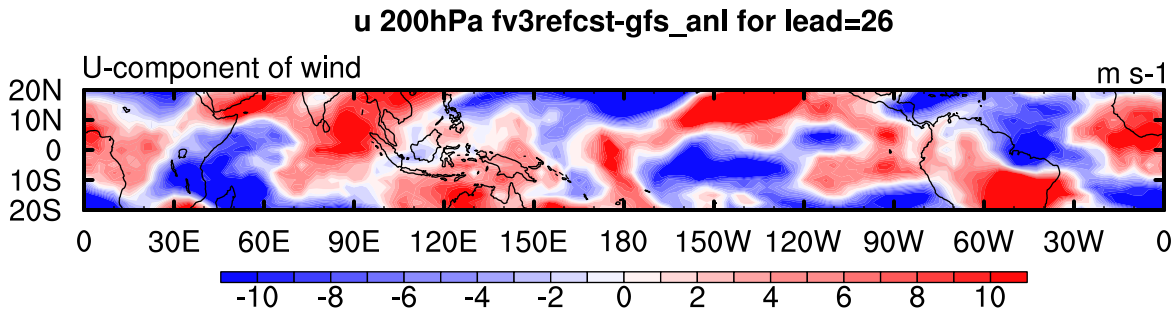

u 850hPa cGEFS-gfs_anl for lead=26
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

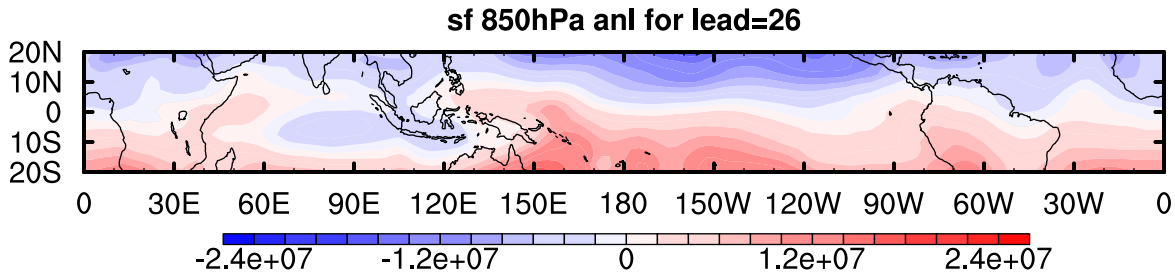

u 200hPa anl for lead=26
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

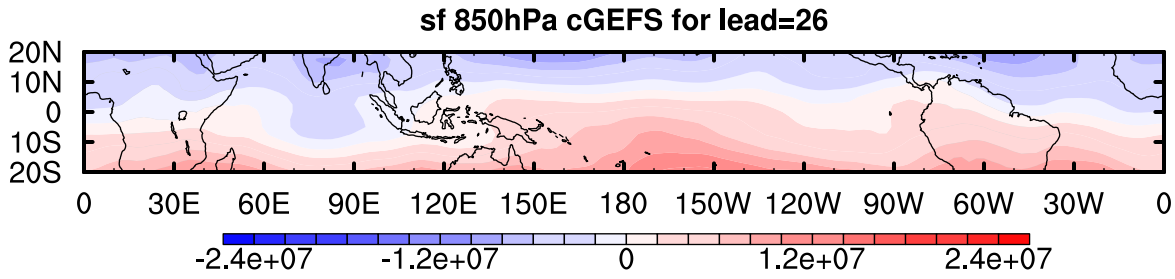

u 200hPa cGEFS for lead=26
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

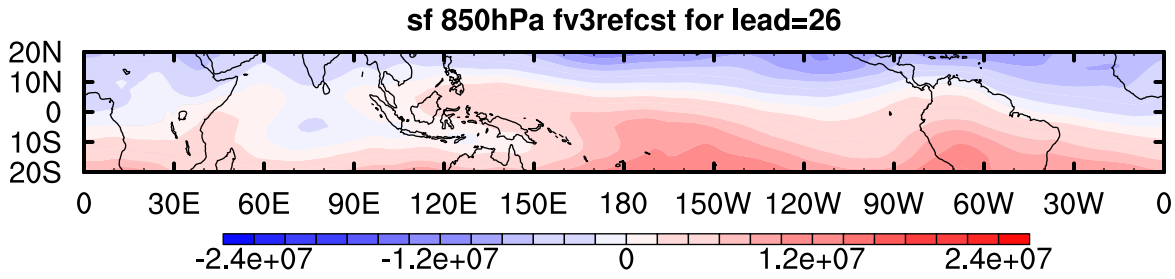

u 200hPa fv3refcst for lead=26
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

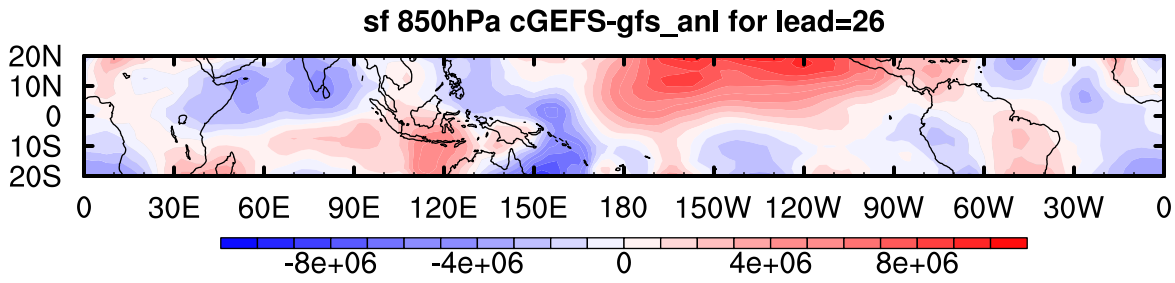

u 200hPa cGEFS-gfs_anl for lead=26
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

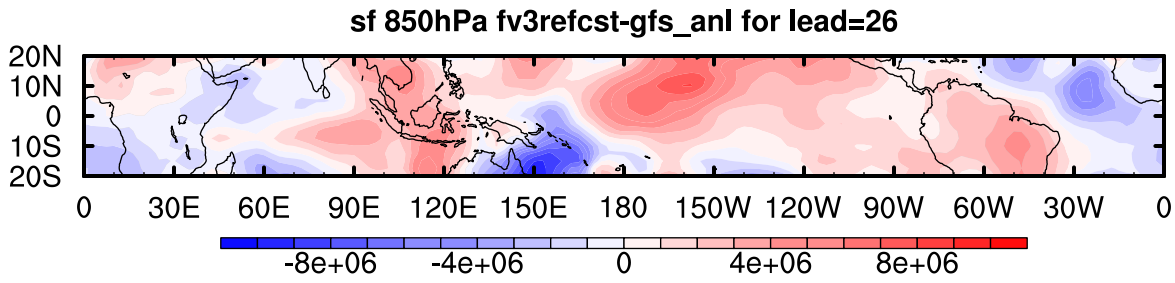

u 200hPa fv3refcst-gfs_anl for lead=26
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


sf 850hPa anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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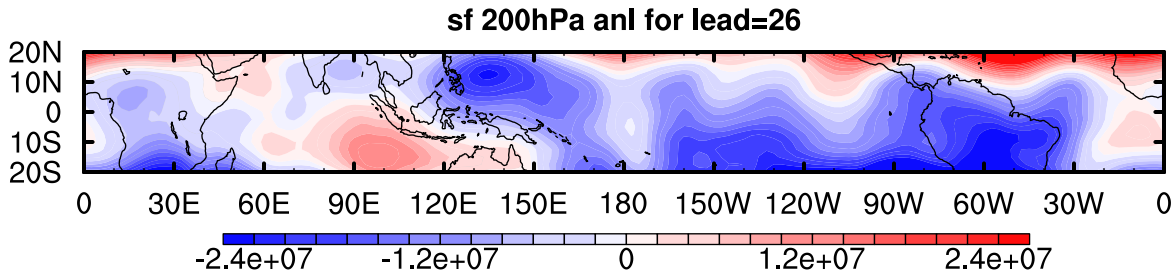
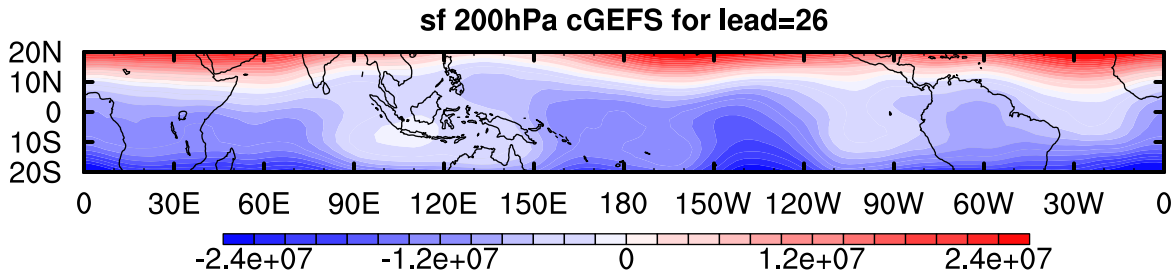
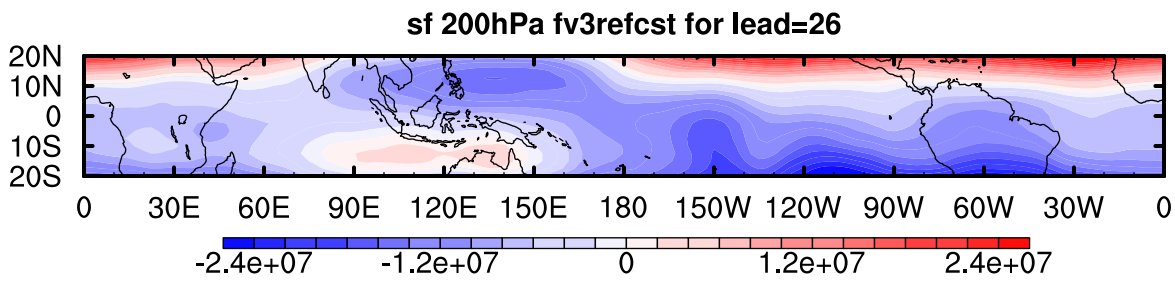
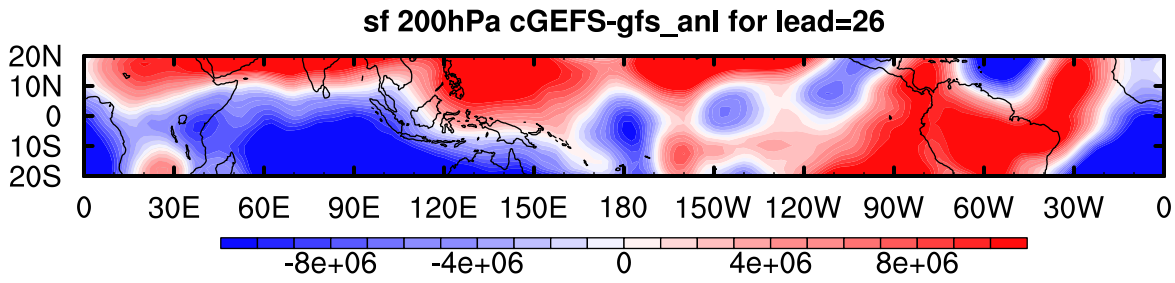
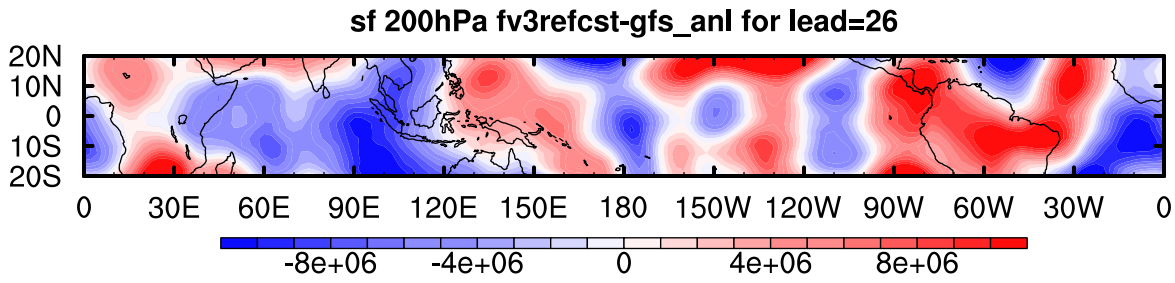
-4e+06
0
4e+06
8e+06

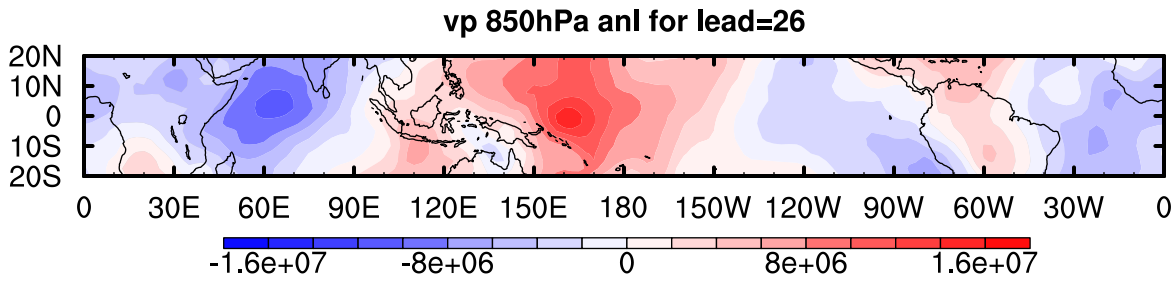

sf 200hPa anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

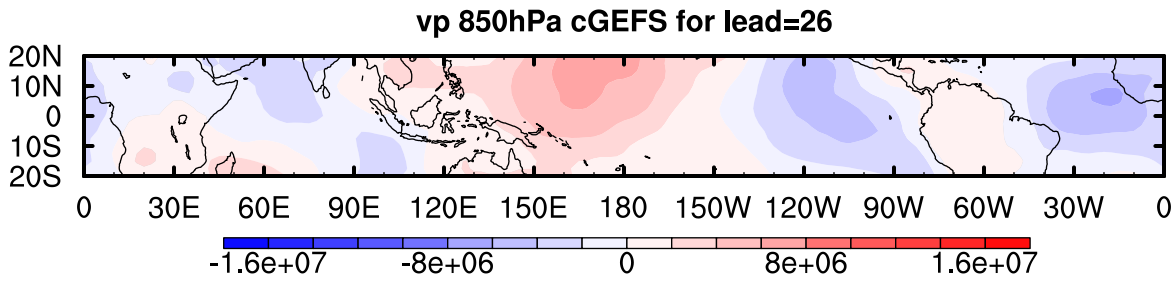

sf 200hPa cGEFS for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

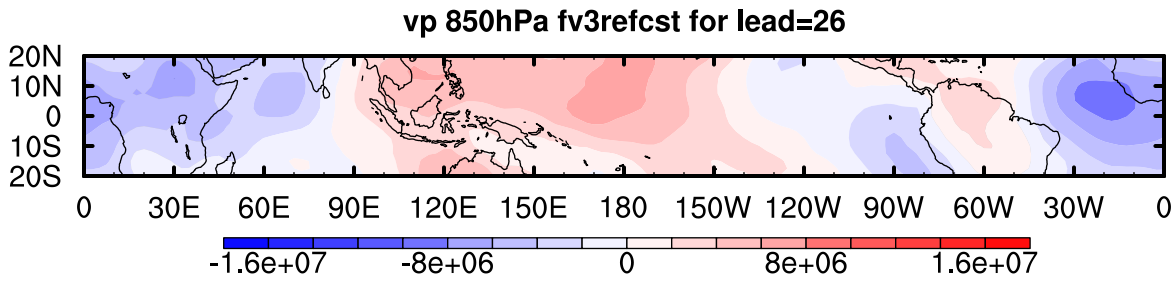

sf 200hPa fv3refcst for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

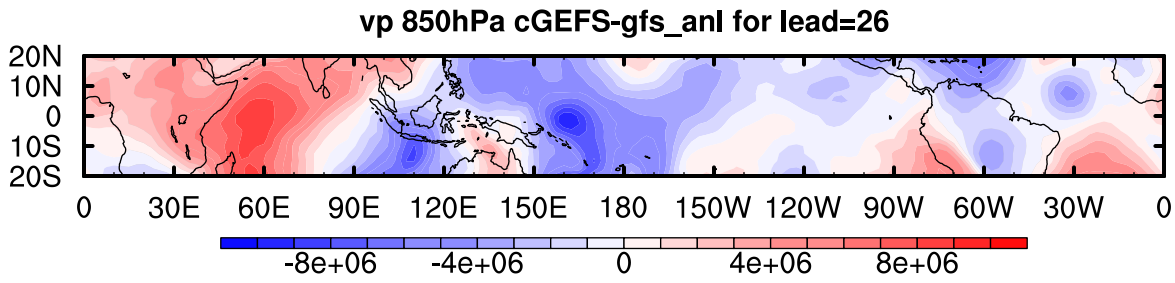

sf 200hPa cGEFS-gfs_anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

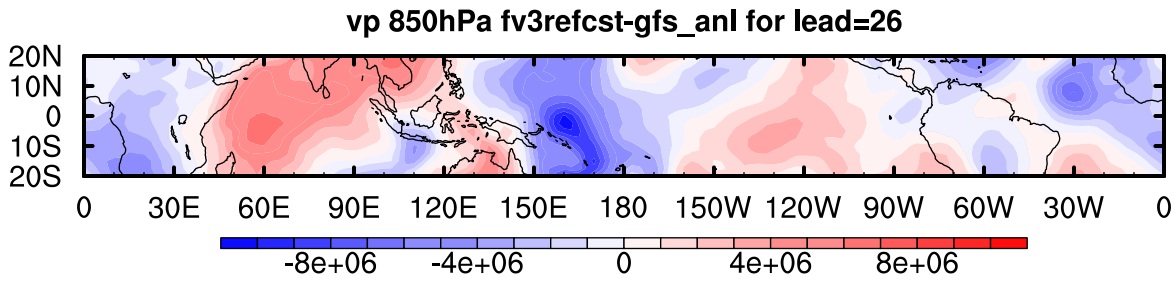

sf 200hPa fv3refcst-gfs_anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

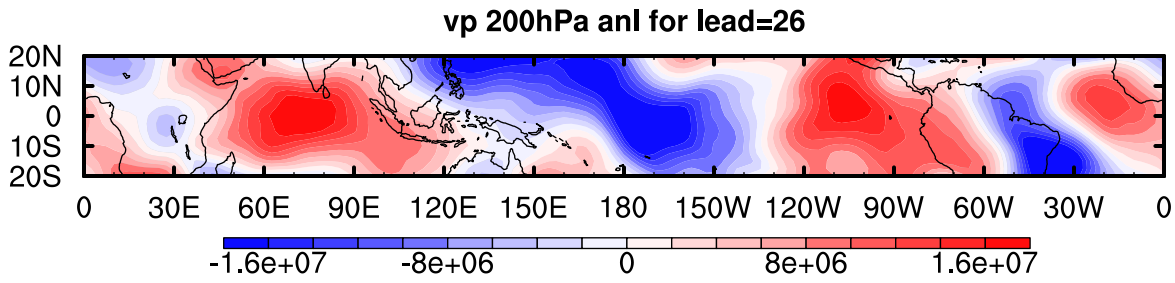

vp 850hPa anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 200hPa anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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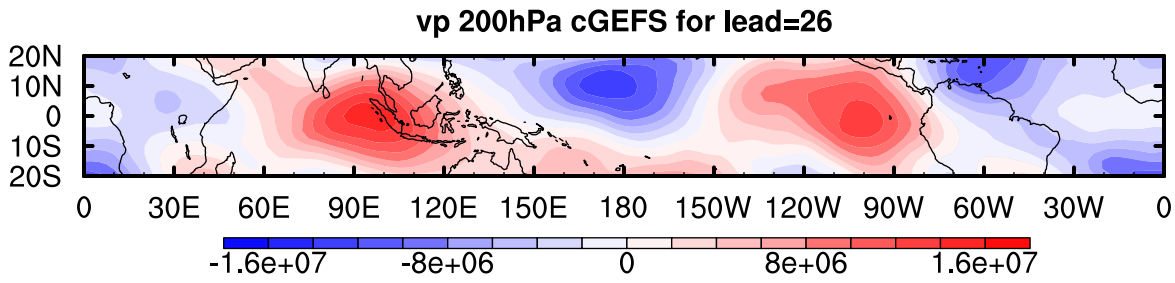
1.6e+07


vp 200hPa cGEFS for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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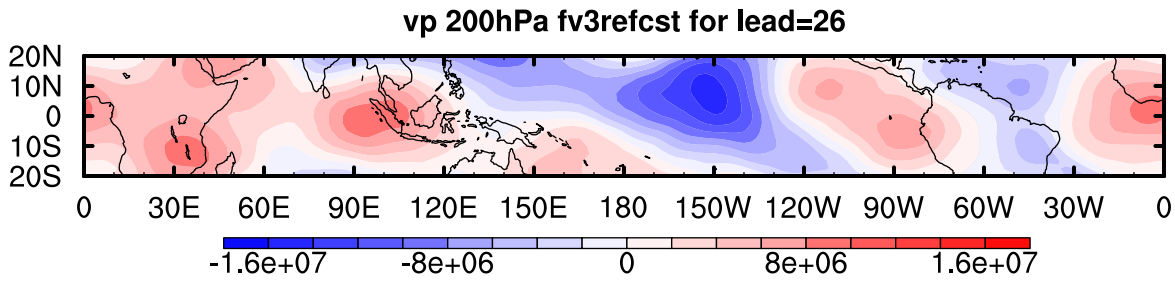
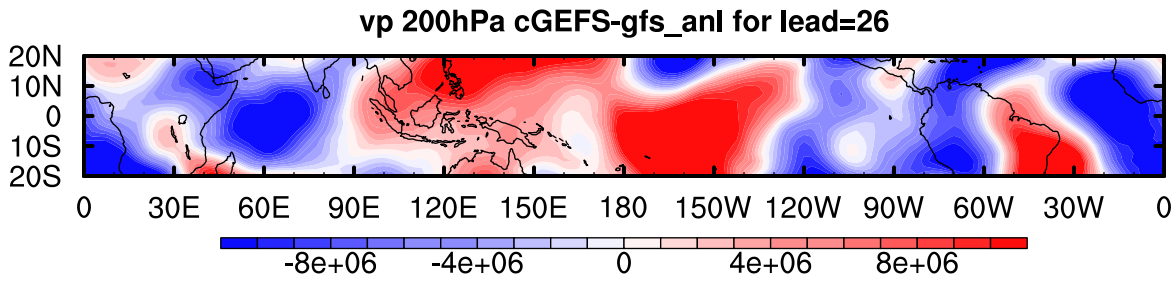
1.6e+07


vp 200hPa fv3refcst for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa cGEFS-gfs_anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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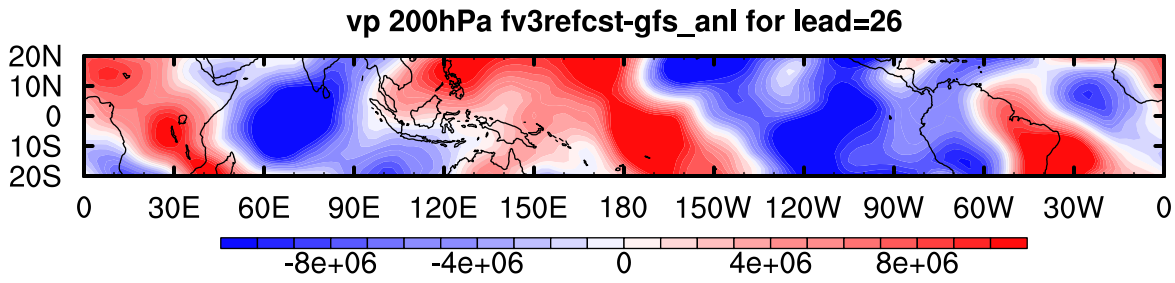
-4e+06
0
4e+06
8e+06


vp 200hPa fv3refcst-gfs_anl for lead=26
20N
10N
0
10S
20S
0
30E
60E
90E
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150E
180
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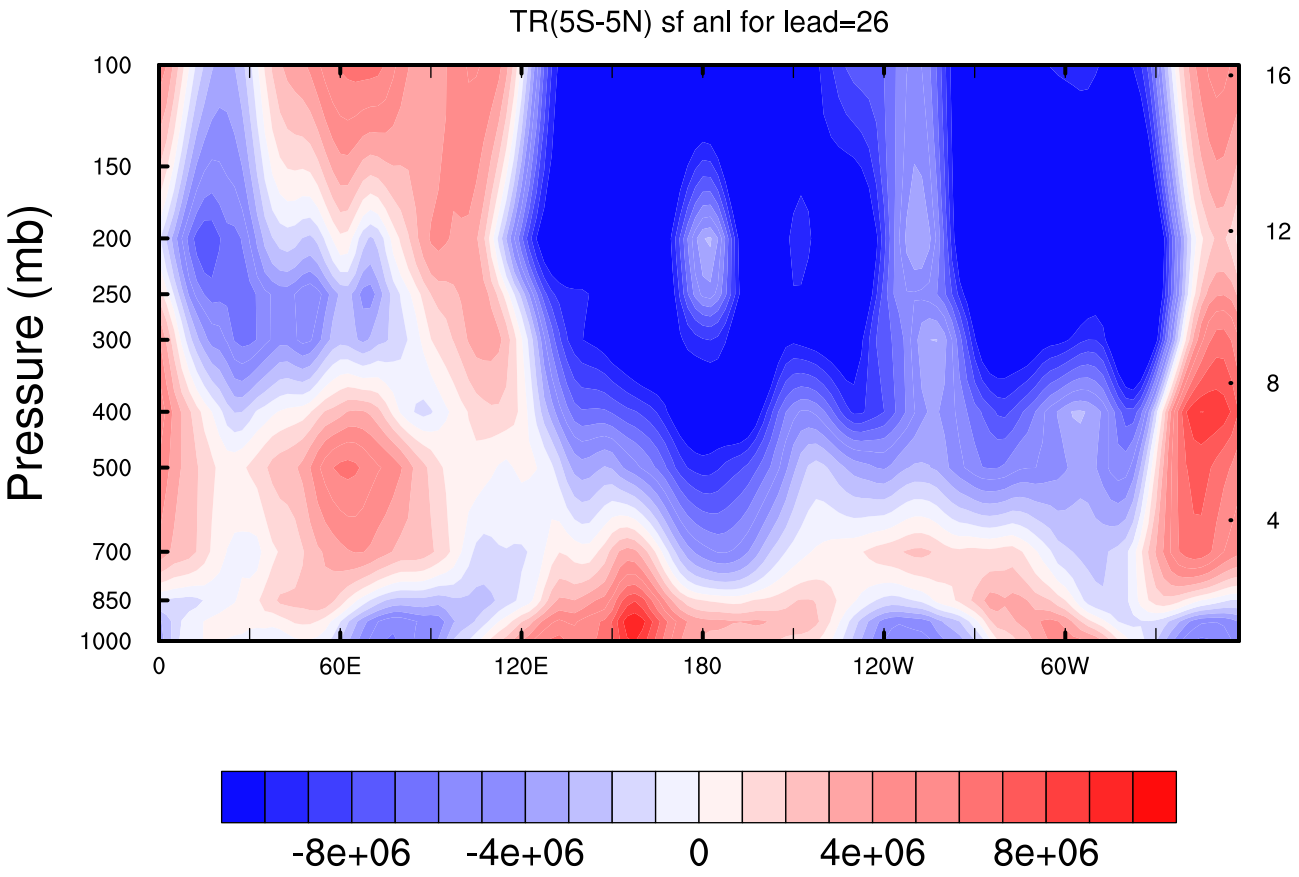
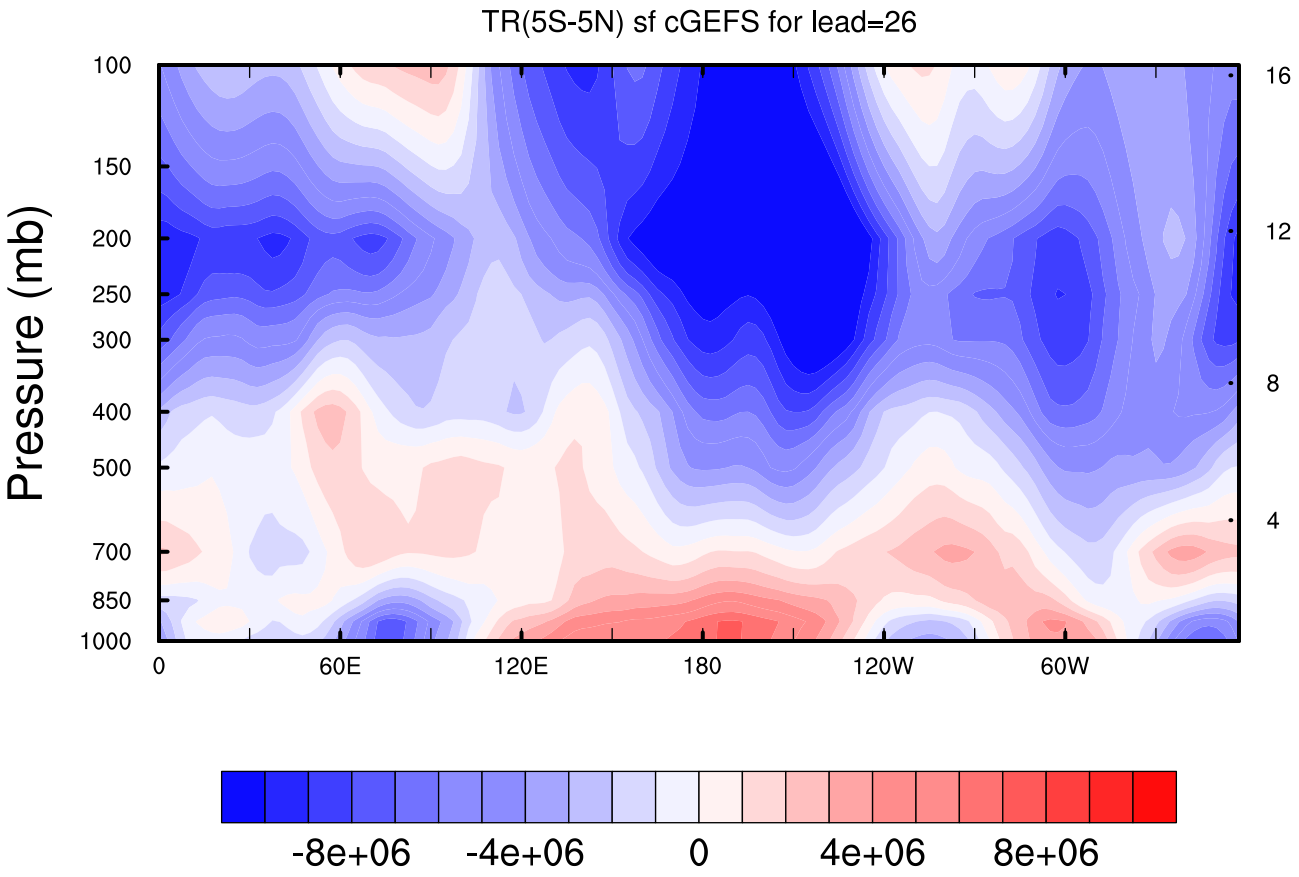
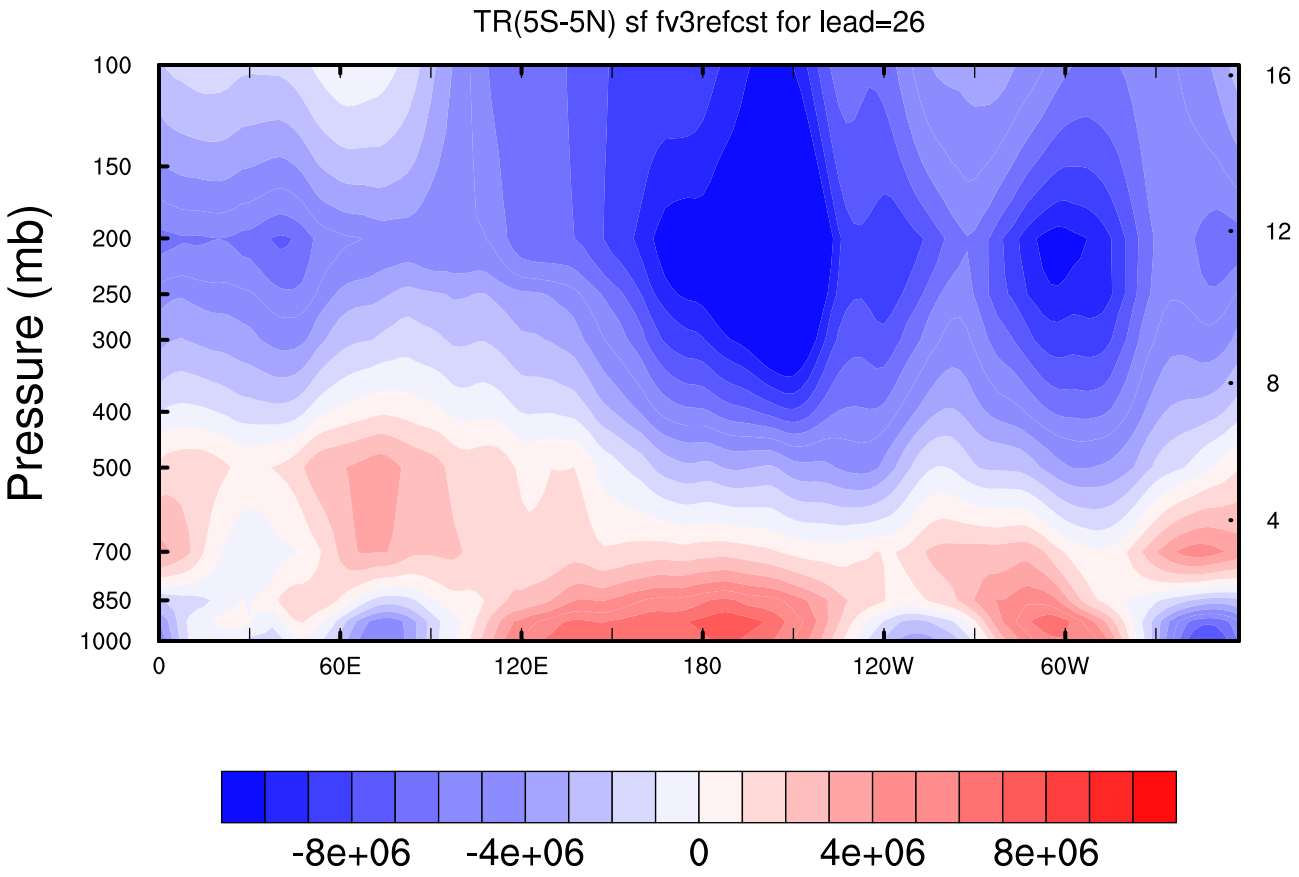
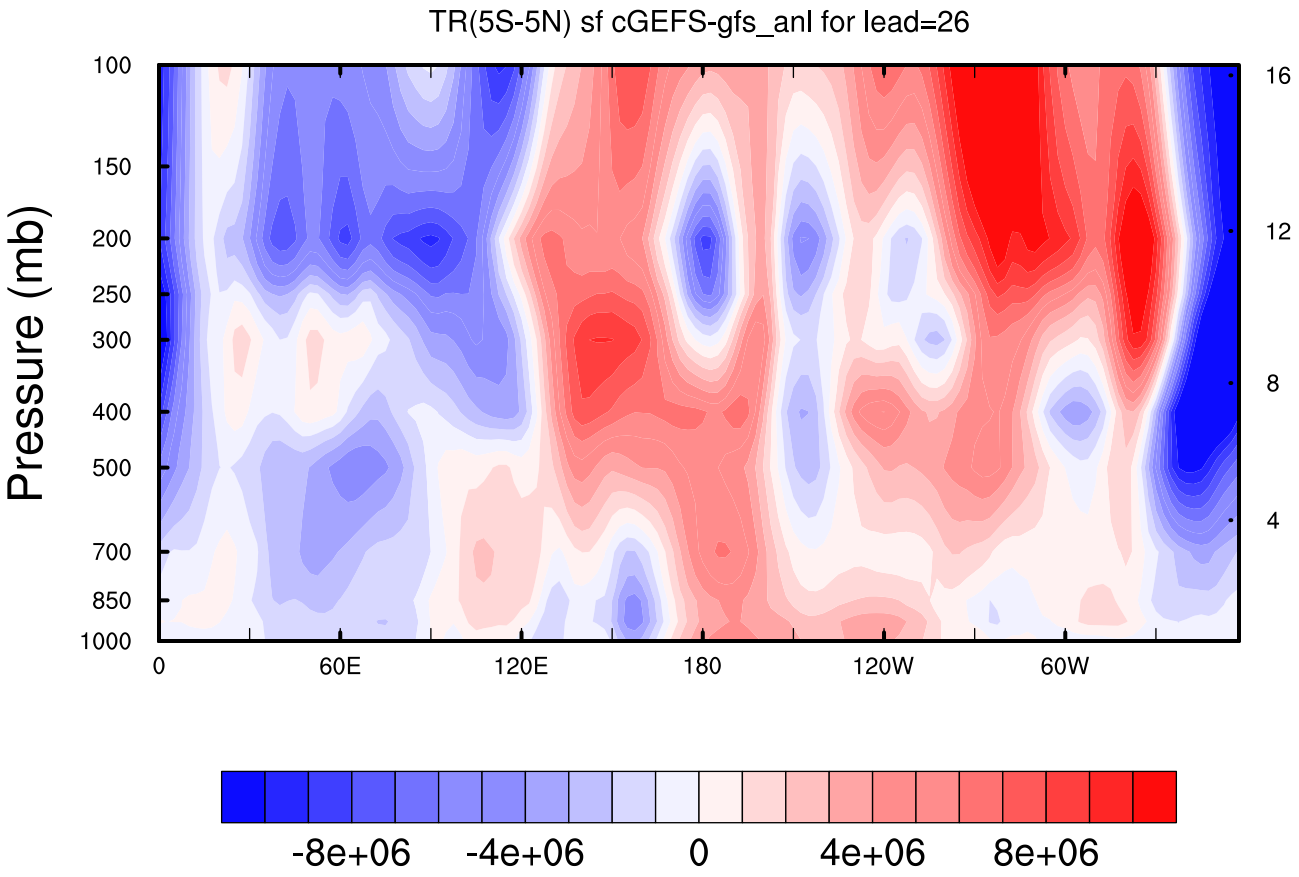
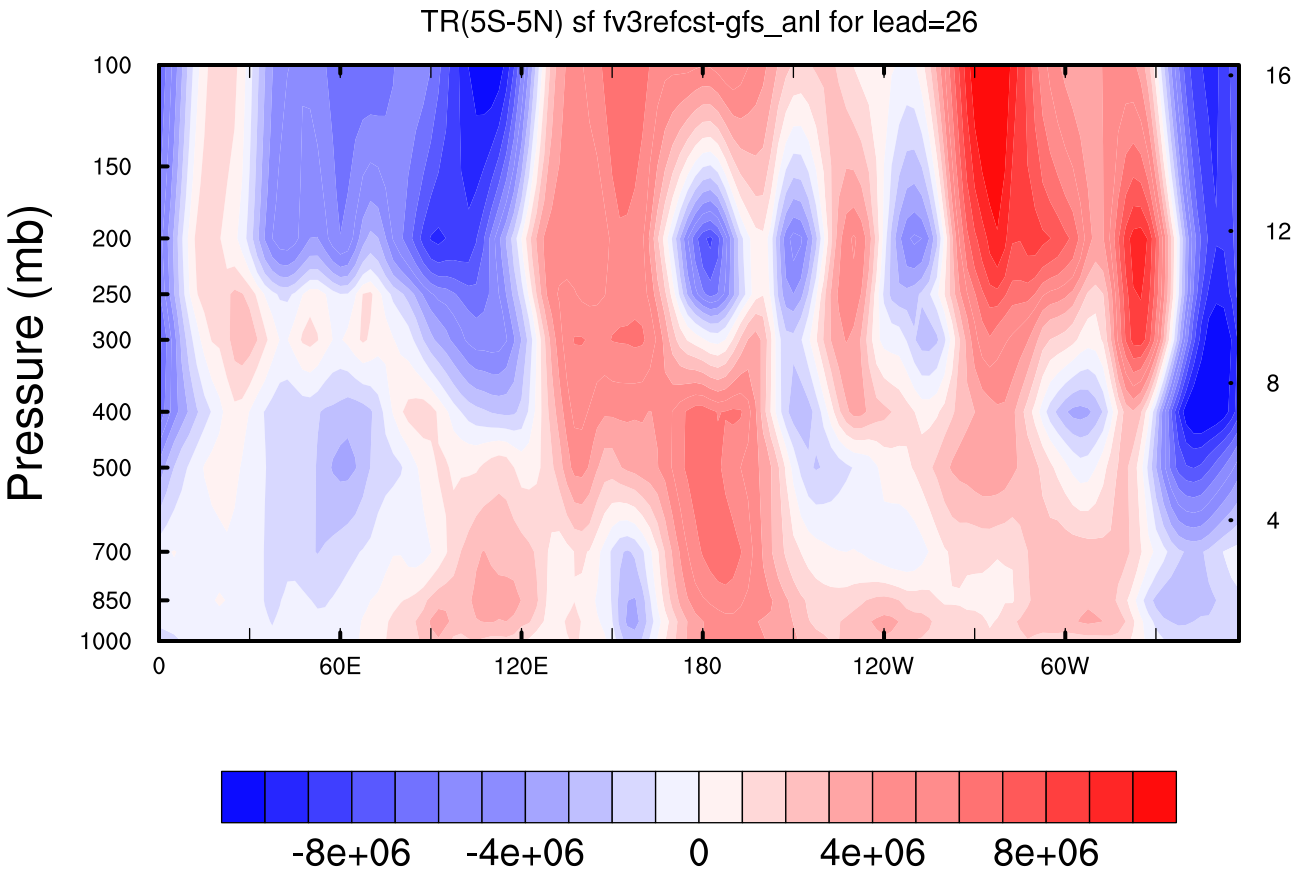
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

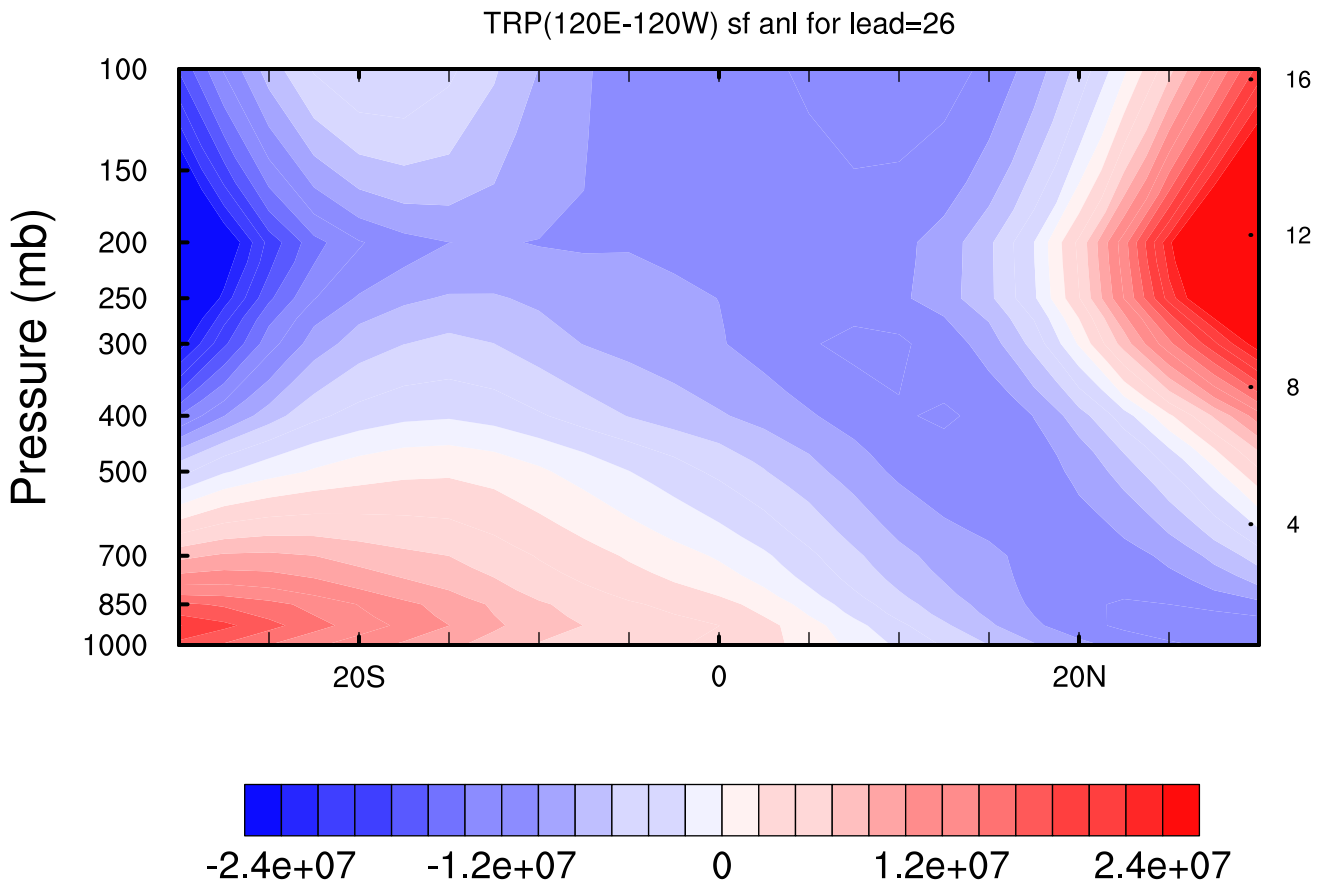

TR(5S-5N) sf anl for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

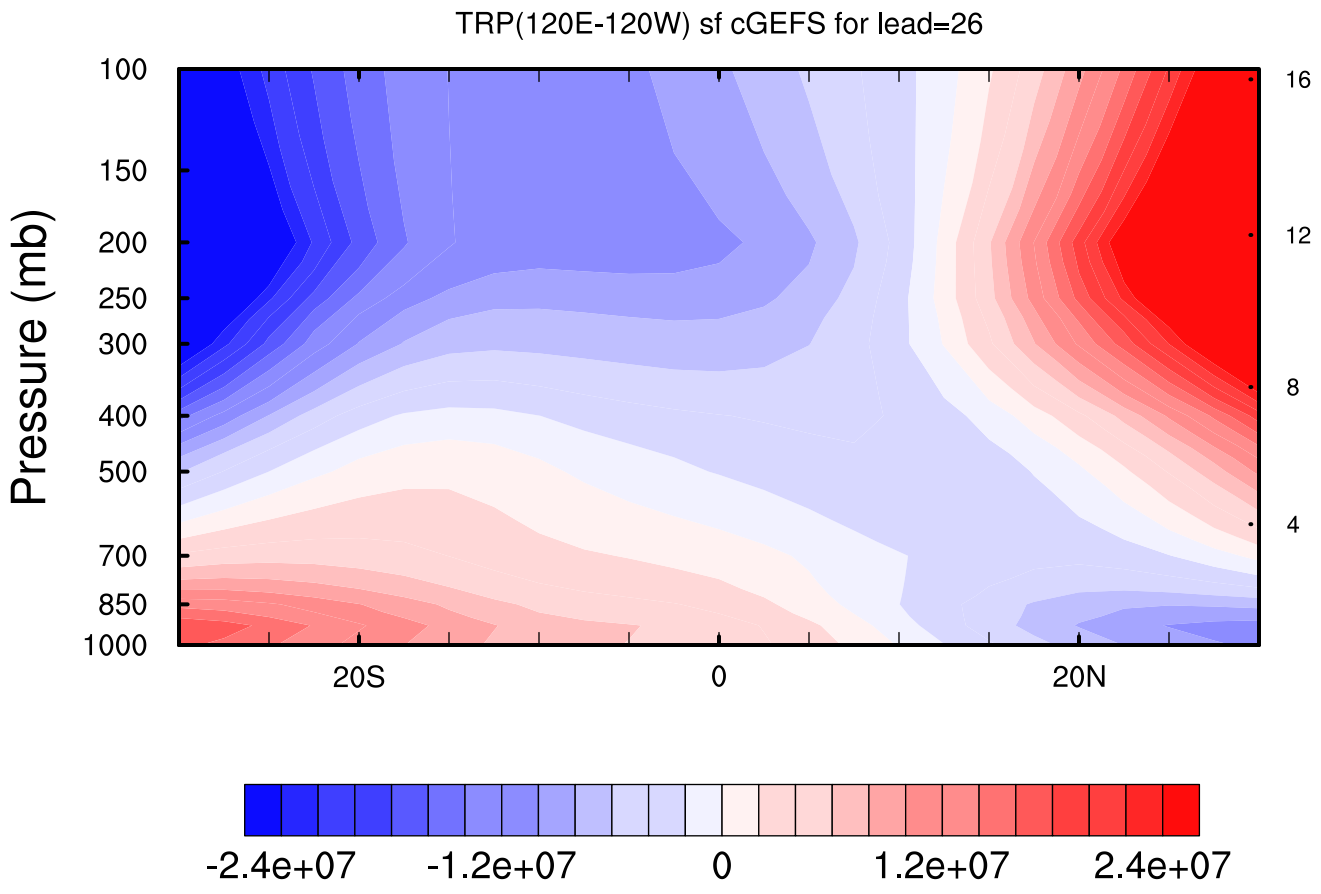

TR(5S-5N) sf cGEFS for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

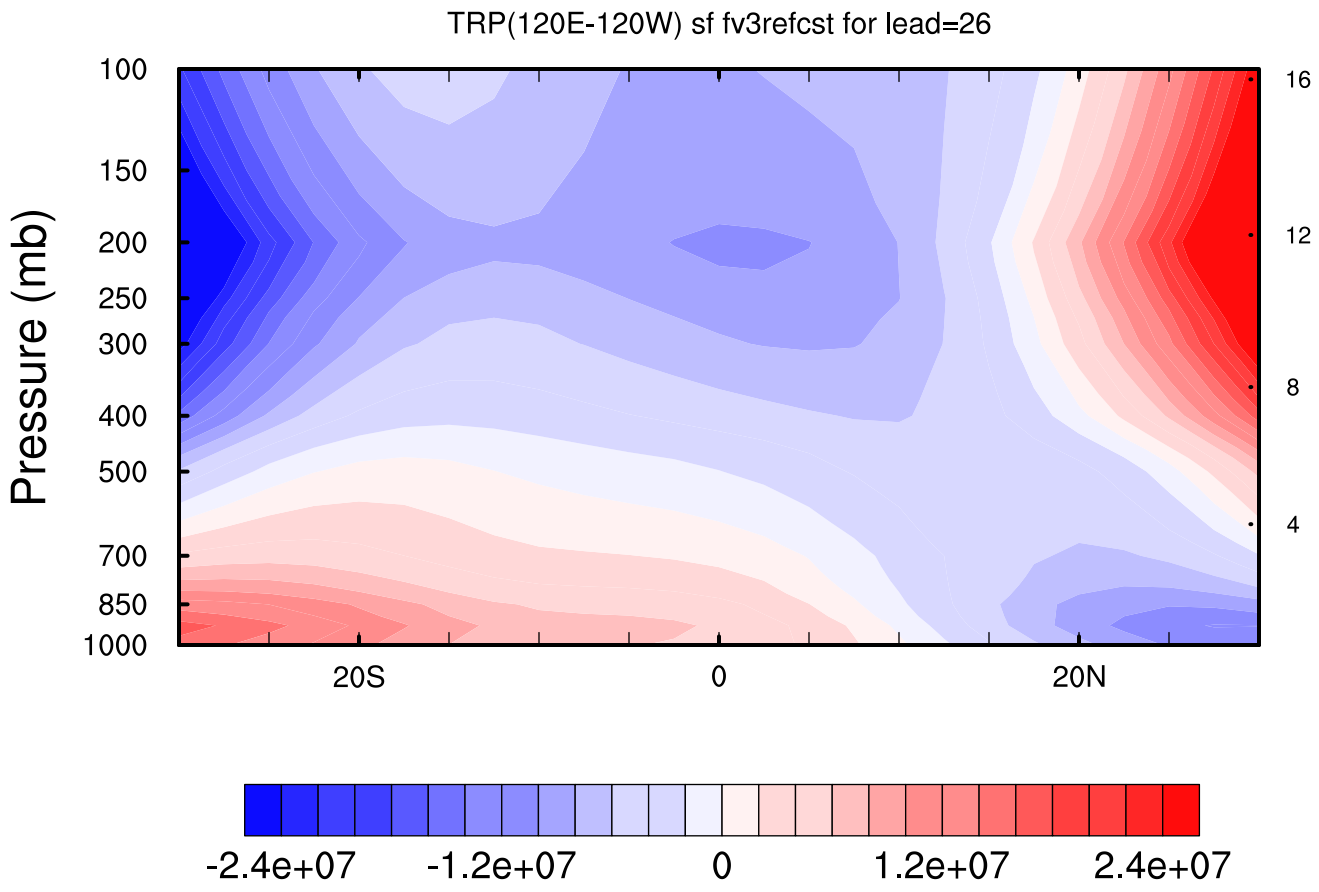

TR(5S-5N) sf fv3refcst for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

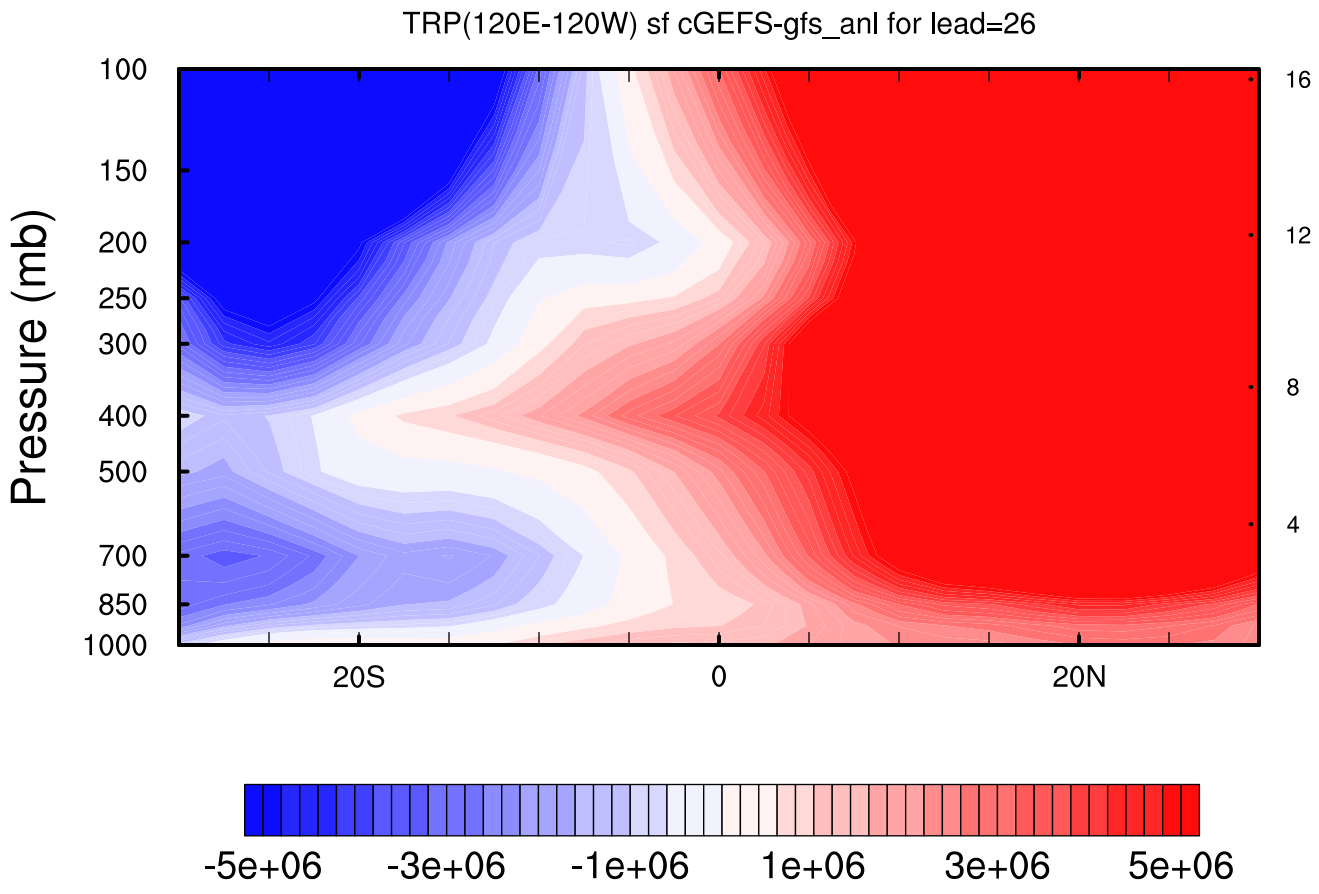

TR(5S-5N) sf cGEFS-gfs_anl for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

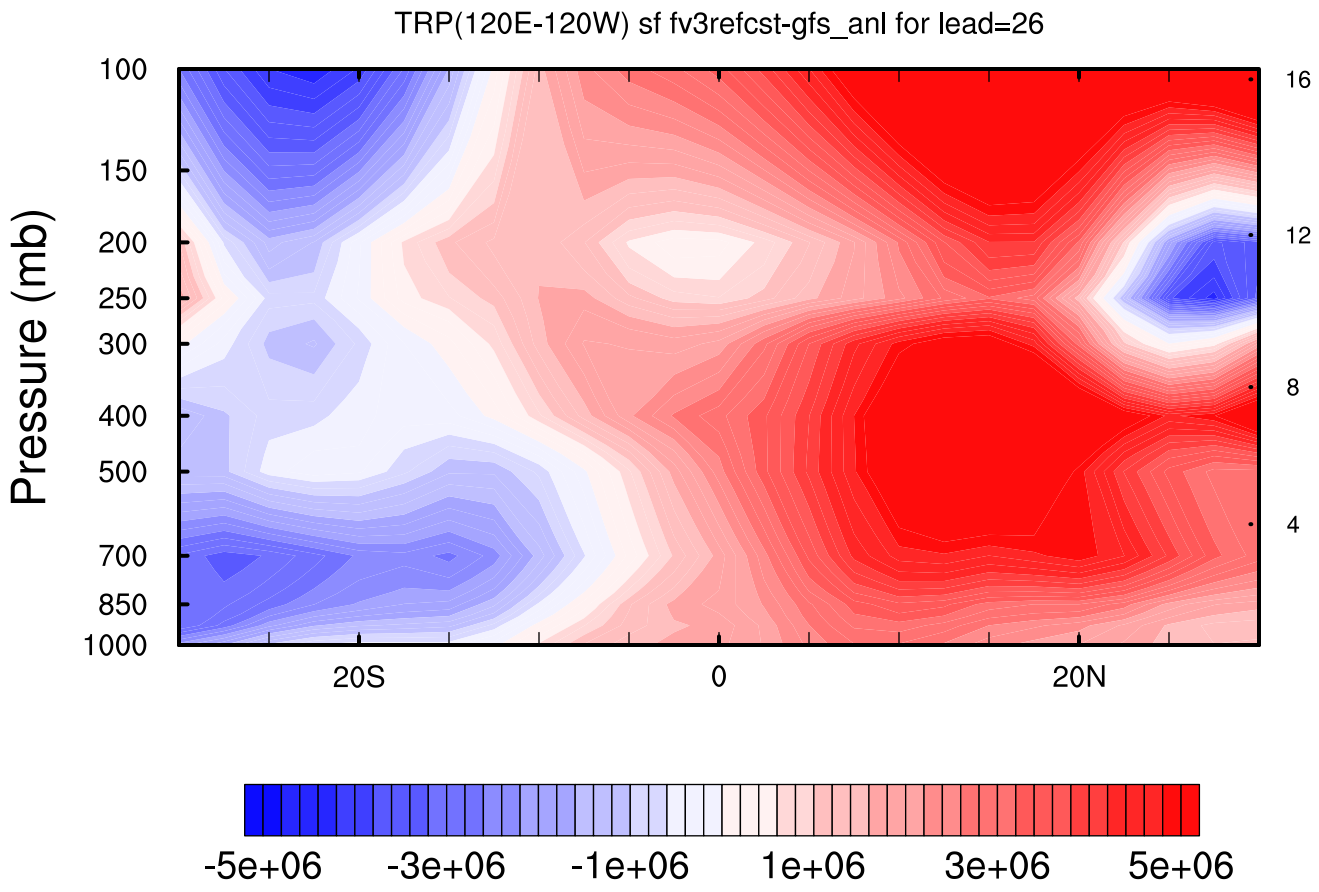

TR(5S-5N) sf fv3refcst-gfs_anl for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

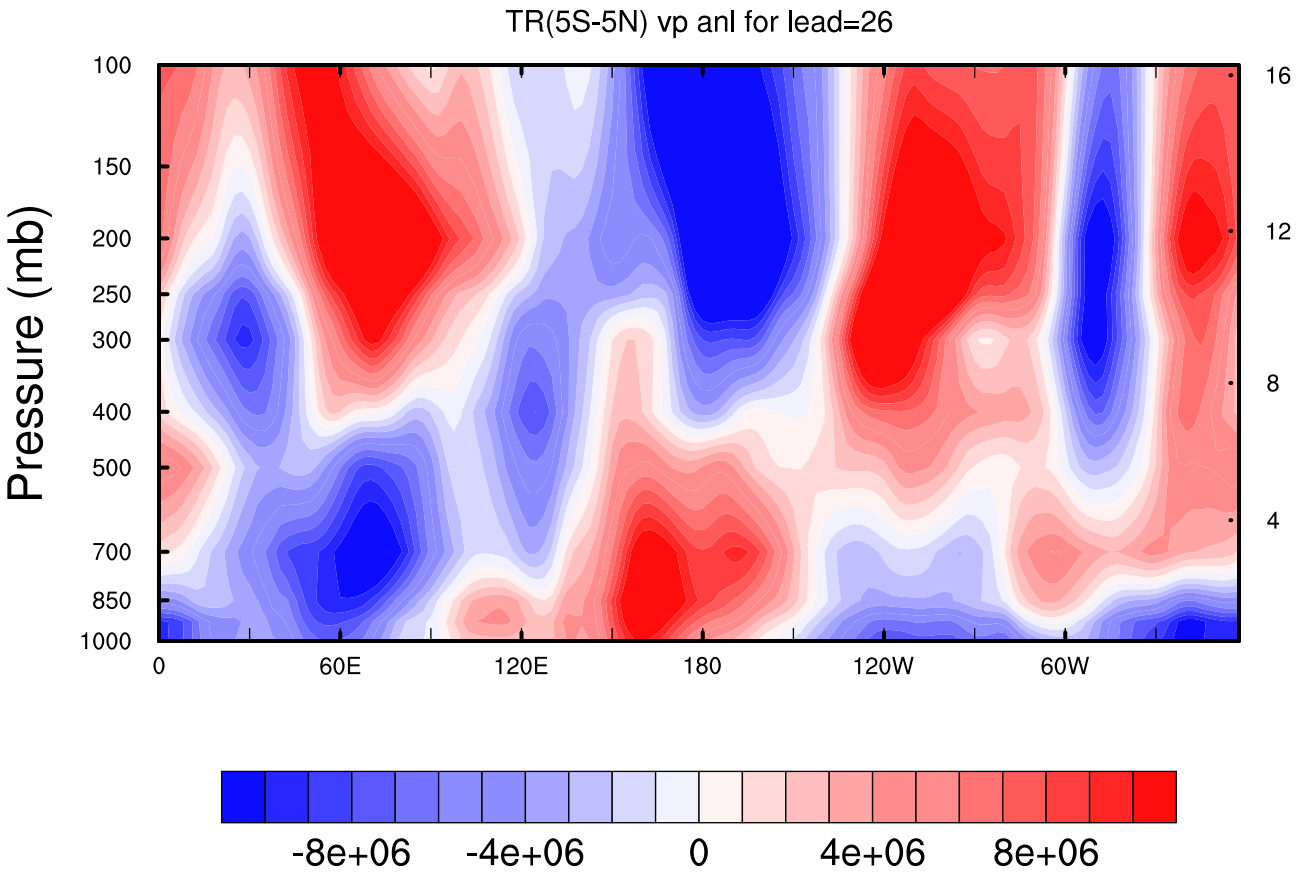

TRP(120E-120W) sf anl for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

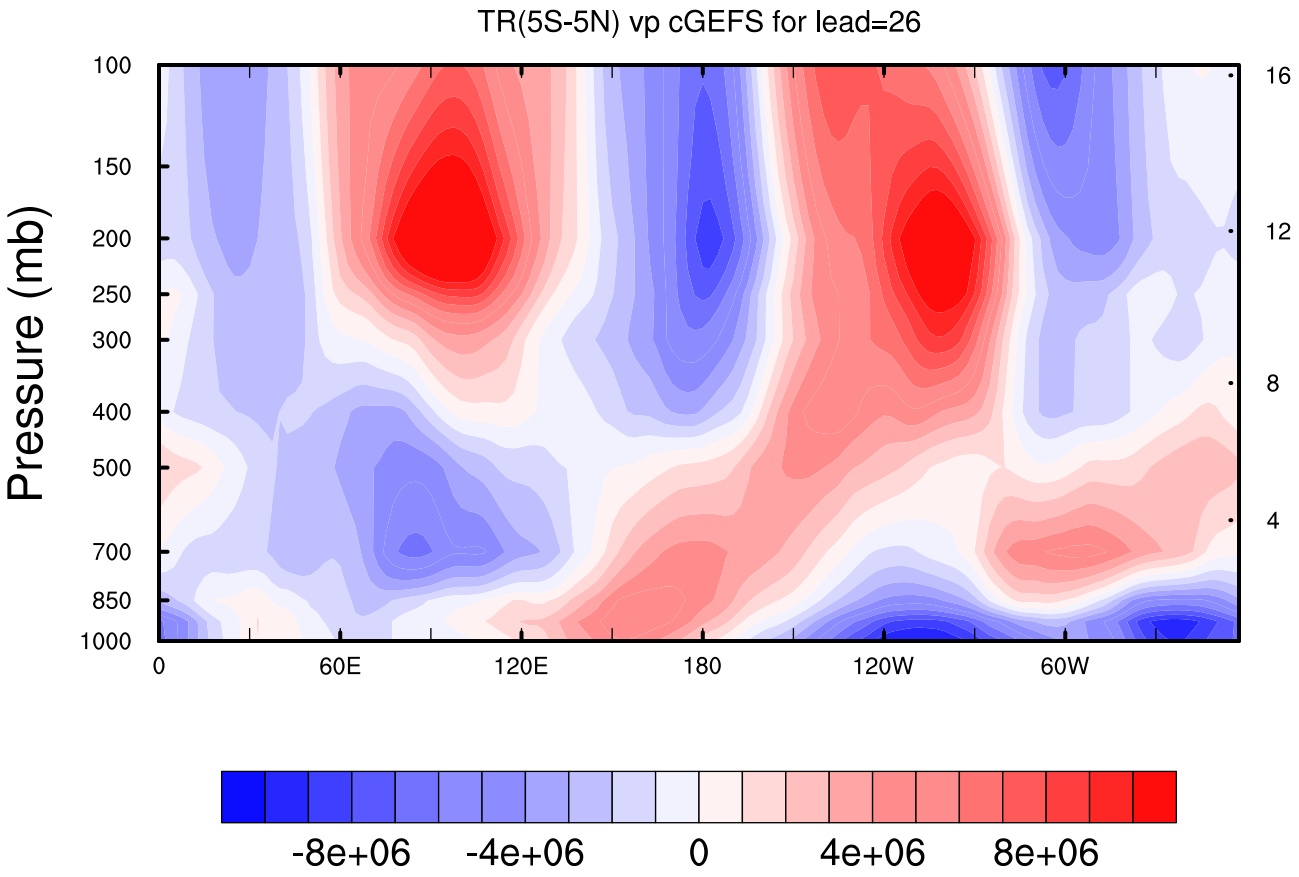

TRP(120E-120W) sf cGEFS for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

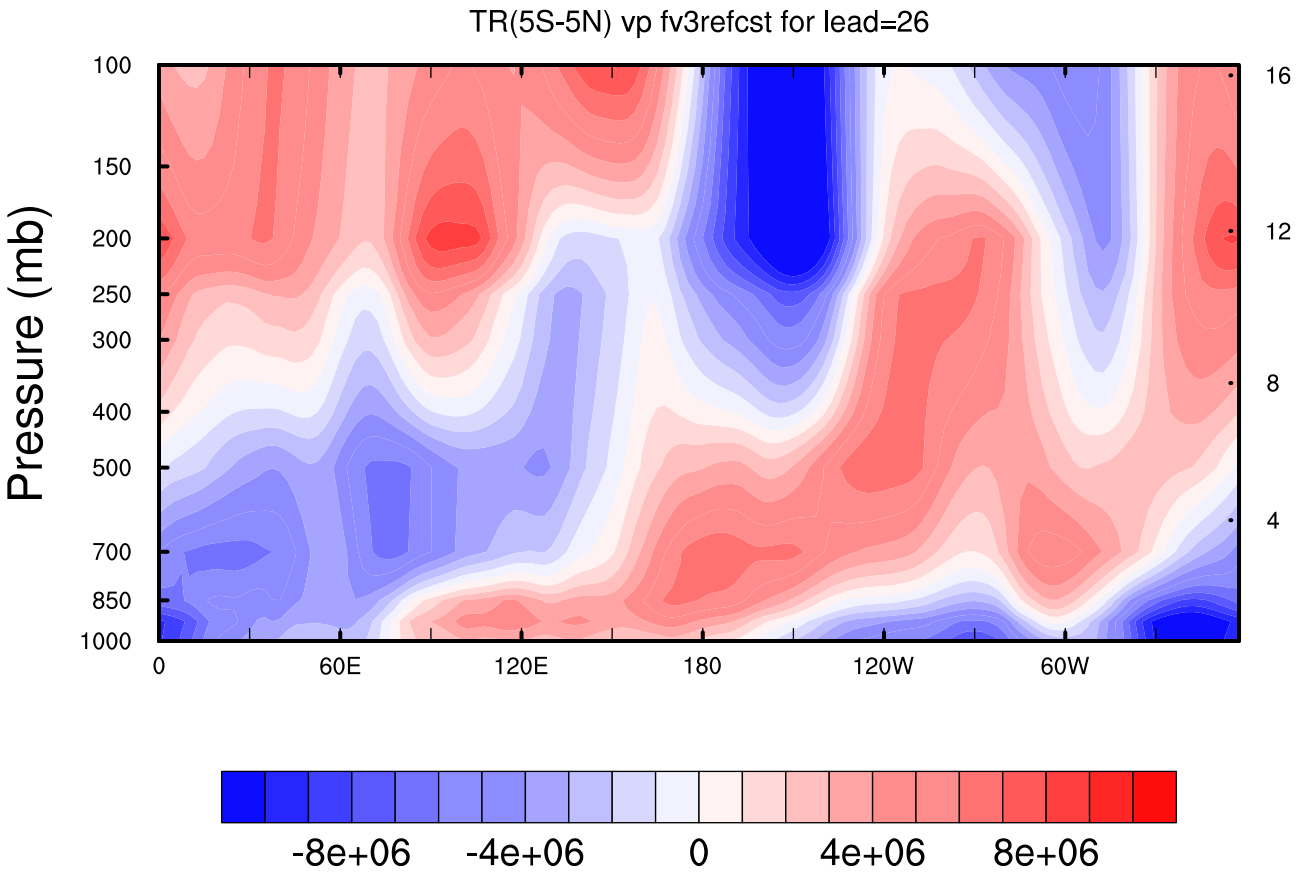

TRP(120E-120W) sf fv3refcst for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

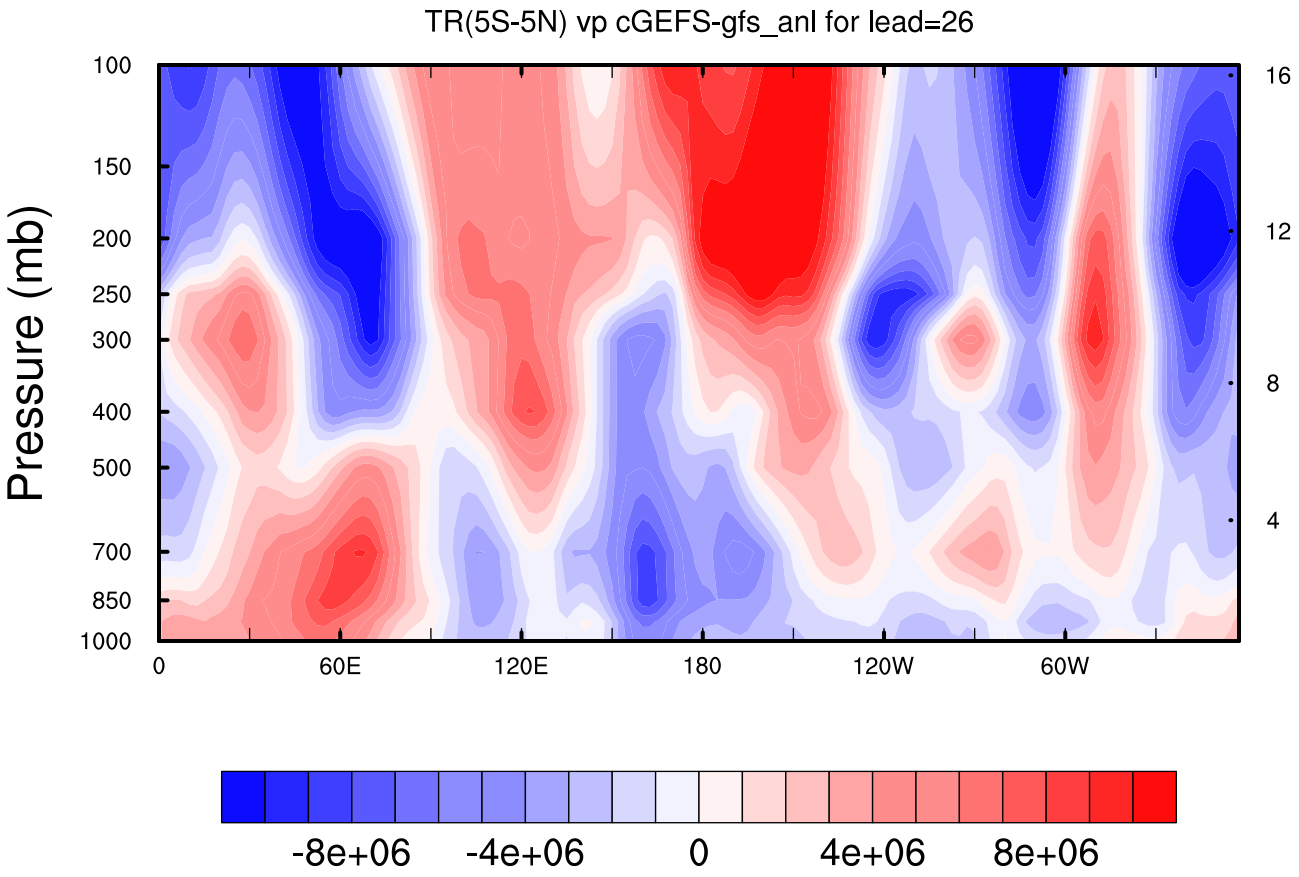

TRP(120E-120W) sf cGEFS-gfs_anl for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

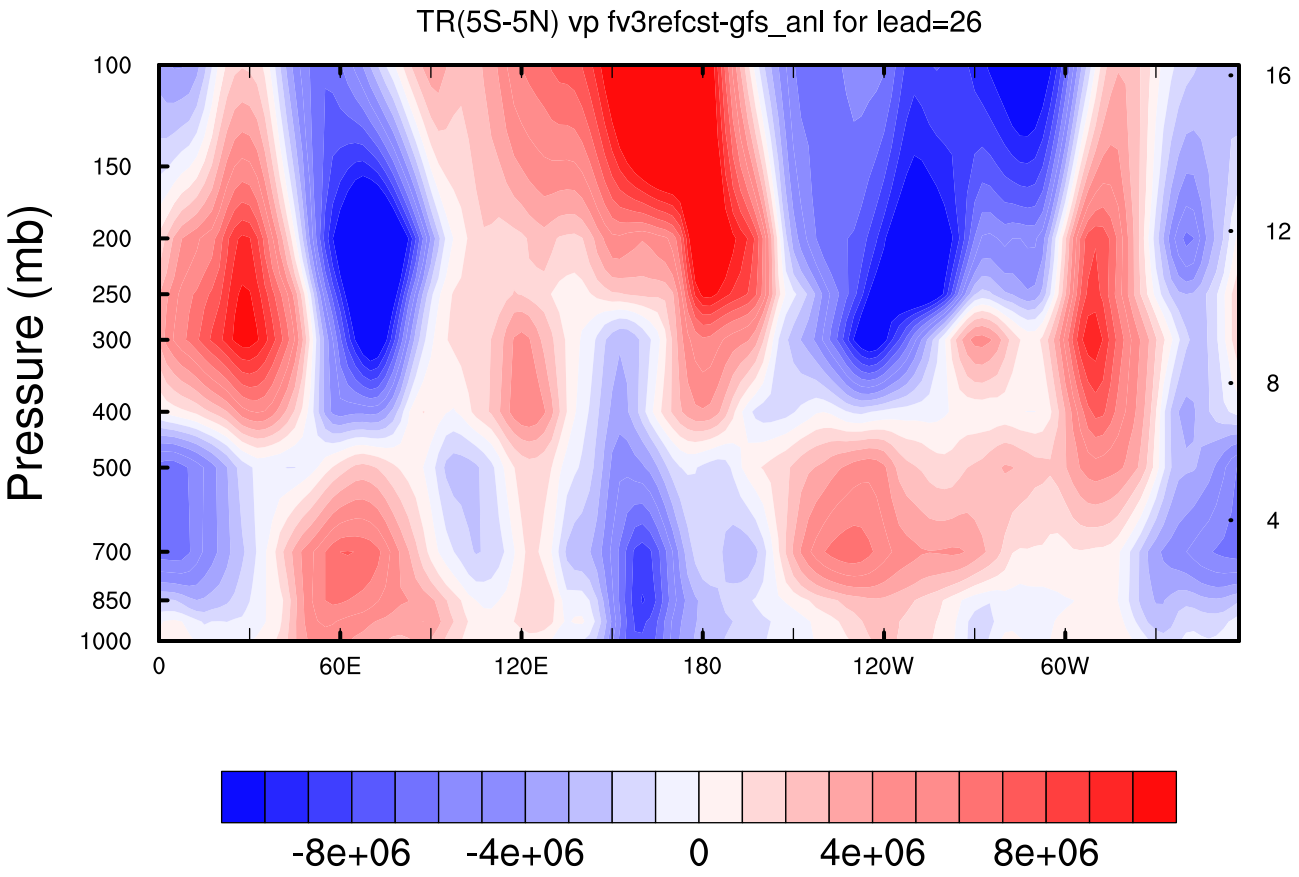

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

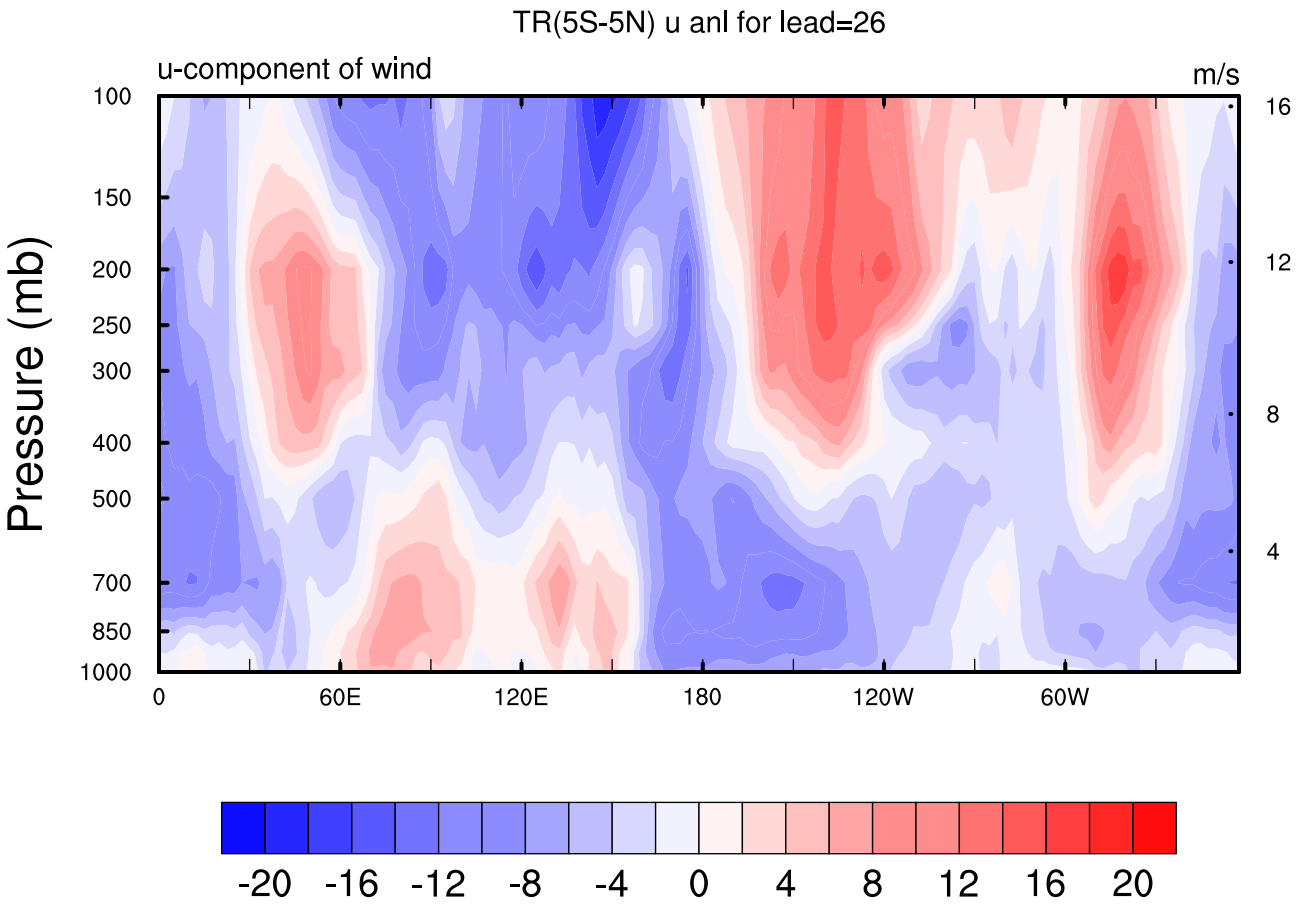

TR(5S-5N) vp anl for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

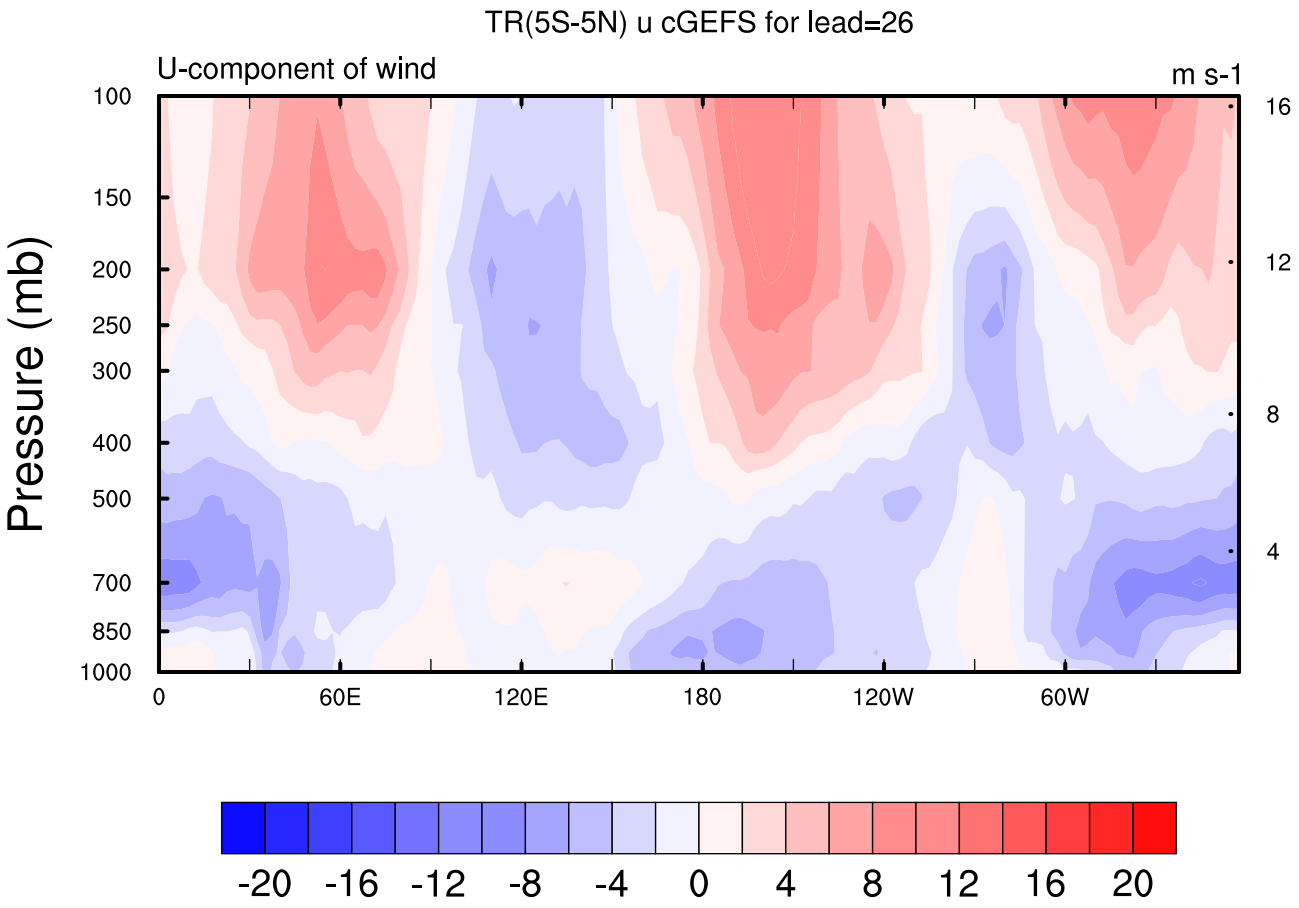

TR(5S-5N) vp cGEFS for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

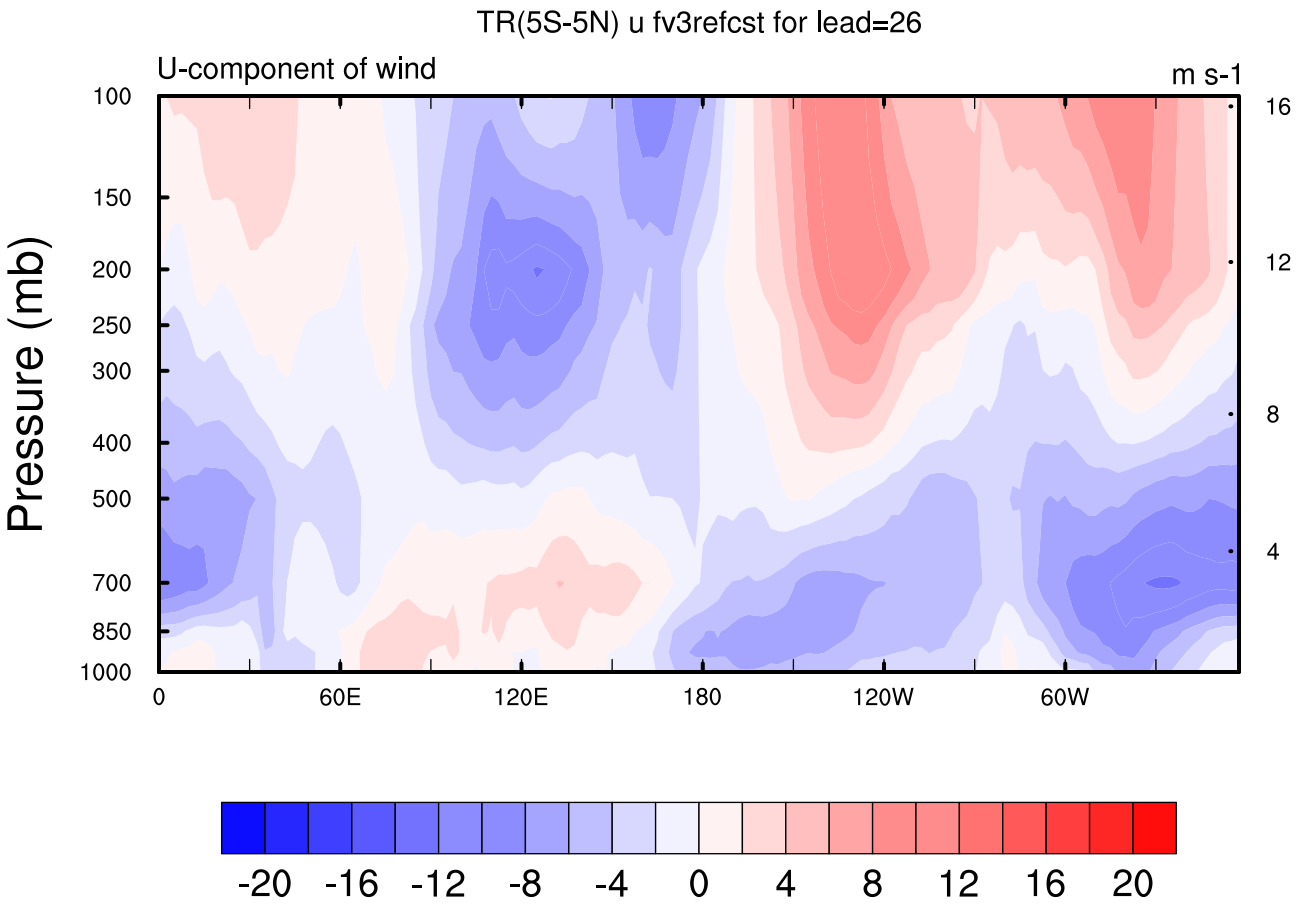

TR(5S-5N) vp fv3refcst for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

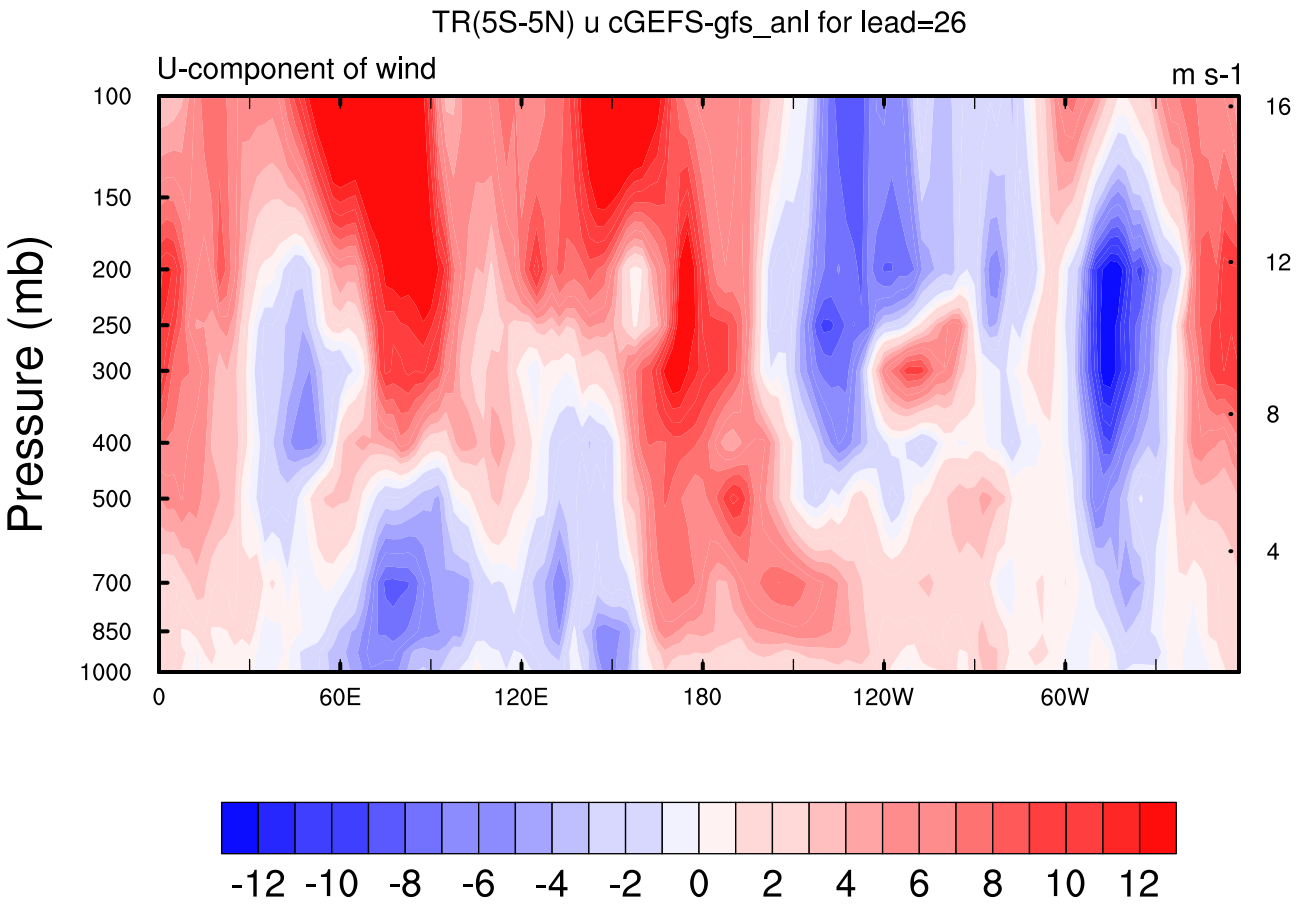

TR(5S-5N) vp cGEFS-gfs_anl for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

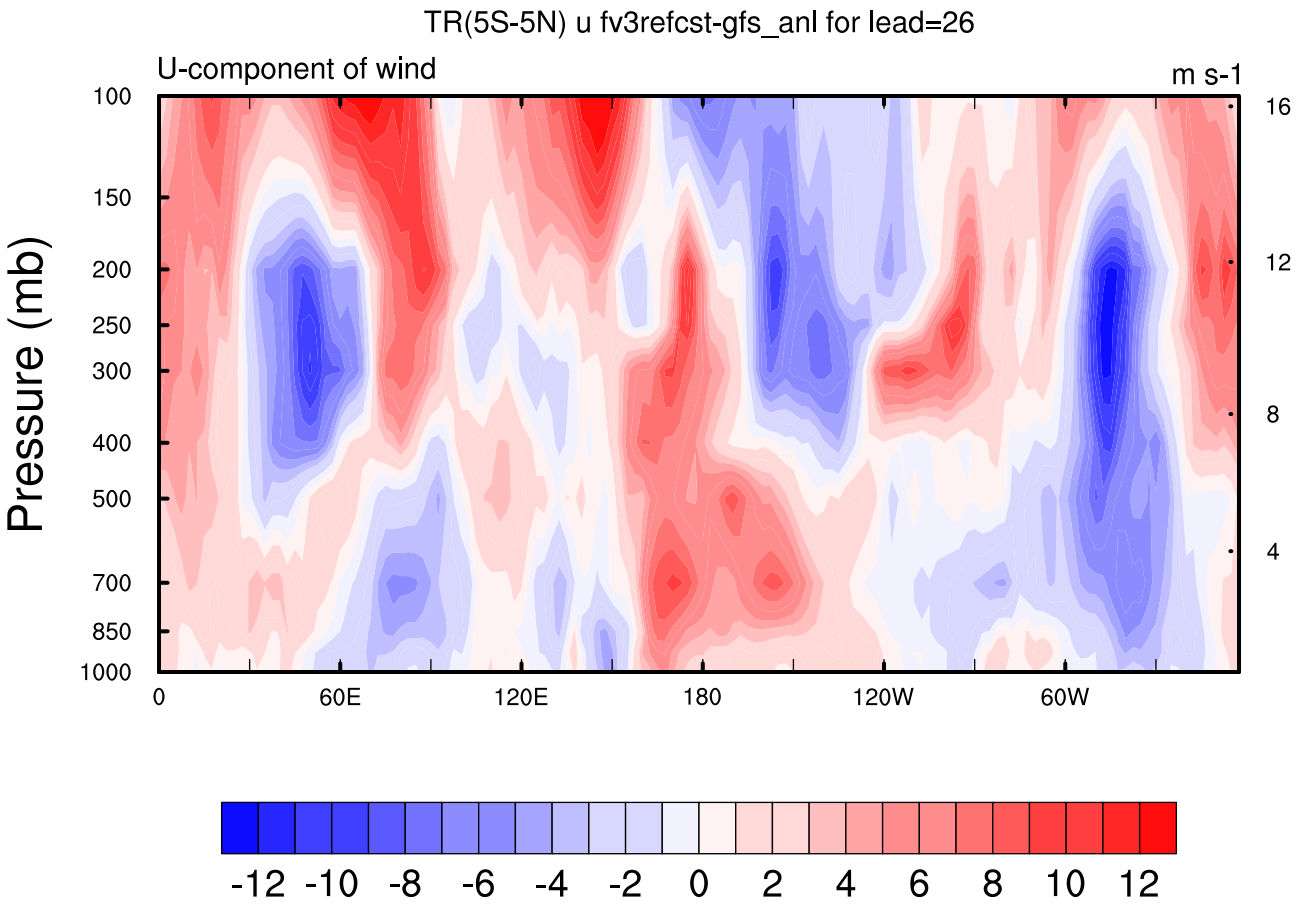

TR(5S-5N) vp fv3refcst-gfs_anl for lead=26
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

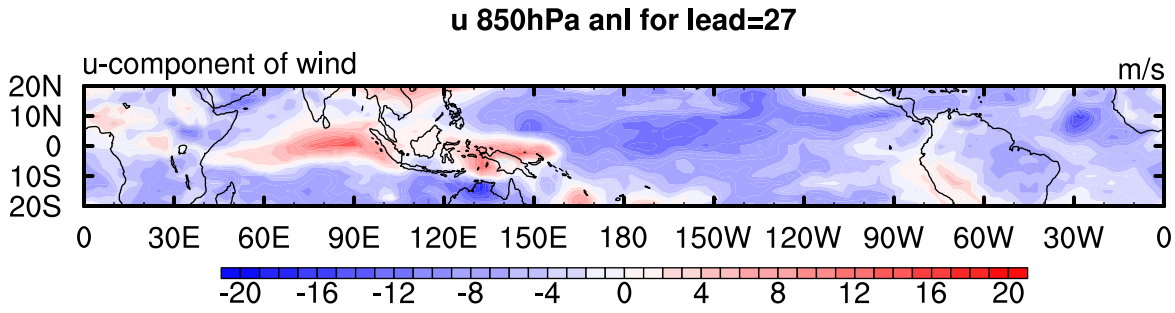

TR(5S-5N) u anl for lead=26
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

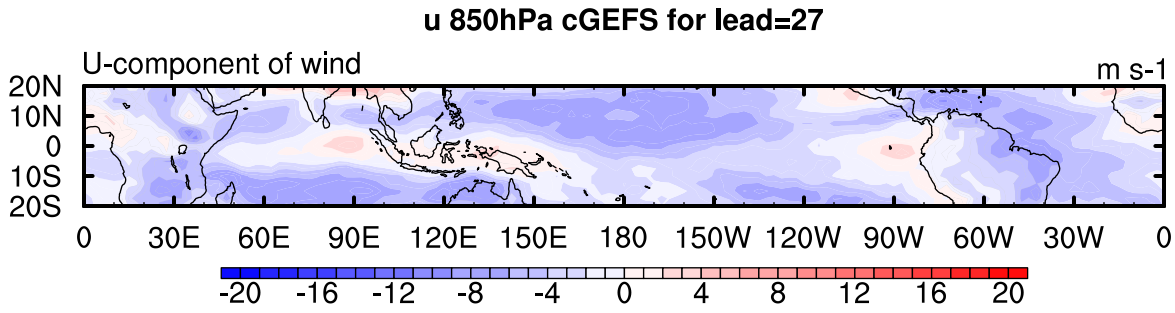

TR(5S-5N) u cGEFS for lead=26
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

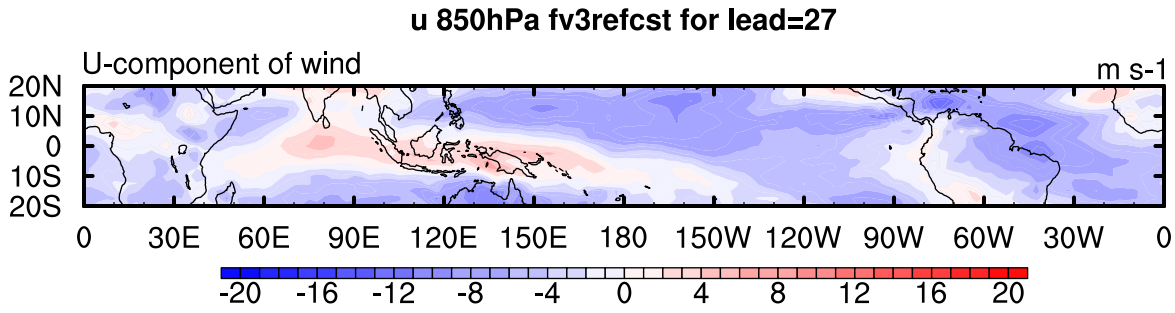

TR(5S-5N) u fv3refcst for lead=26
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

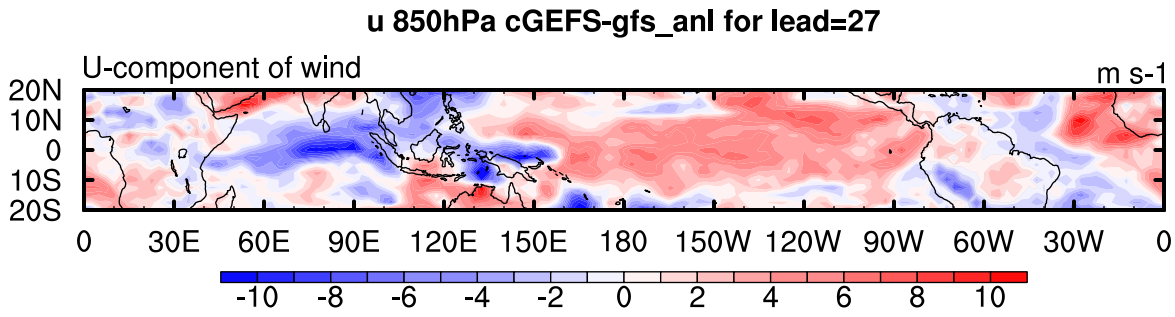

TR(5S-5N) u cGEFS-gfs_anl for lead=26
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=26
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


u 850hPa anl for lead=27
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS for lead=27
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa fv3refcst for lead=27
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=27
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
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-6
-4
-2
0
2
4
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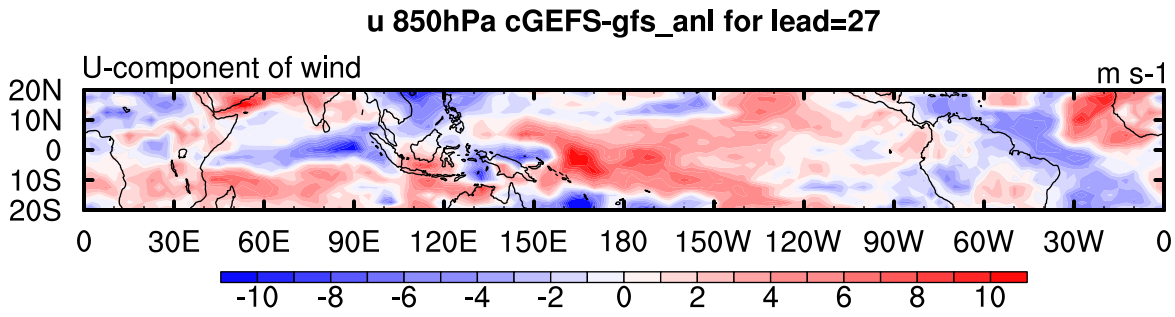
8
10


u 850hPa cGEFS-gfs_anl for lead=27
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
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8
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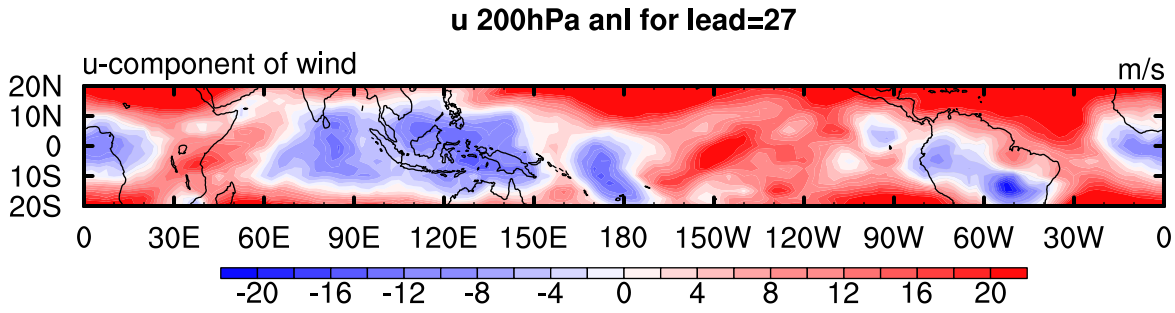
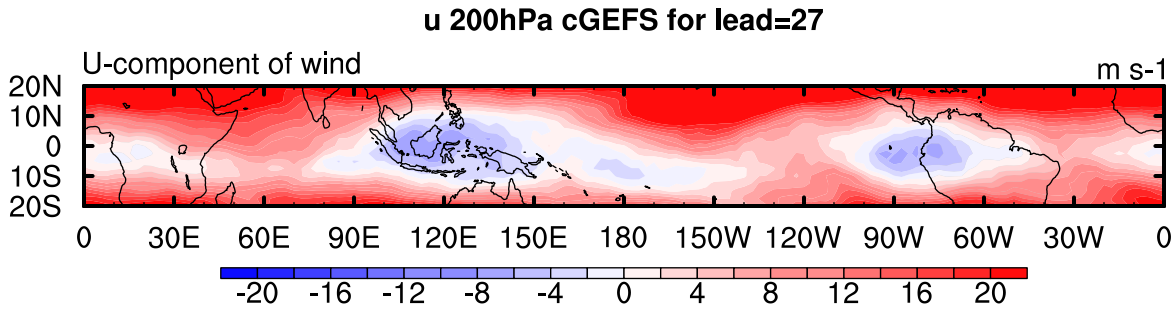
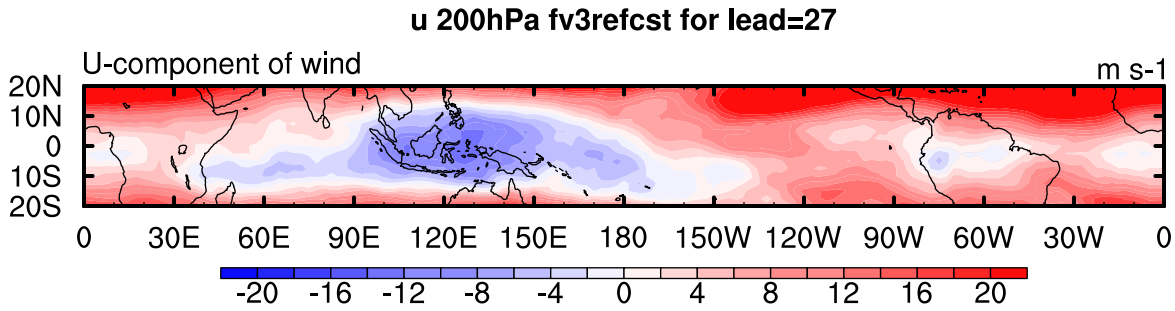
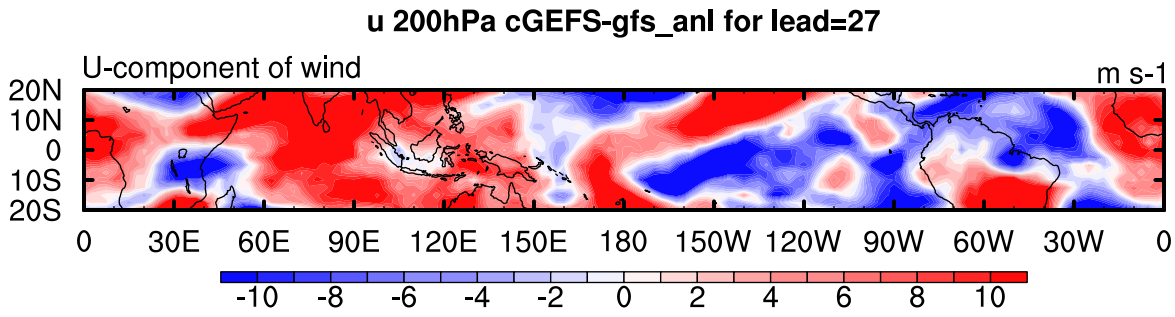

u 200hPa anl for lead=27
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=27
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=27
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=27
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-10
-8
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-4
-2
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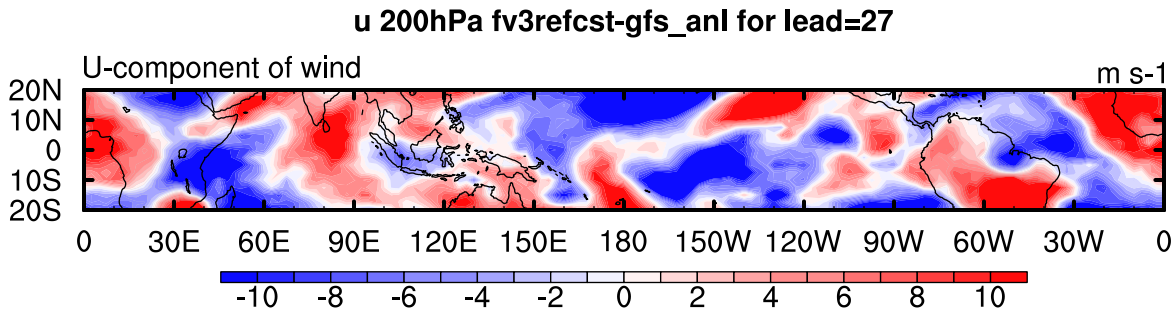
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=27
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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-2
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8
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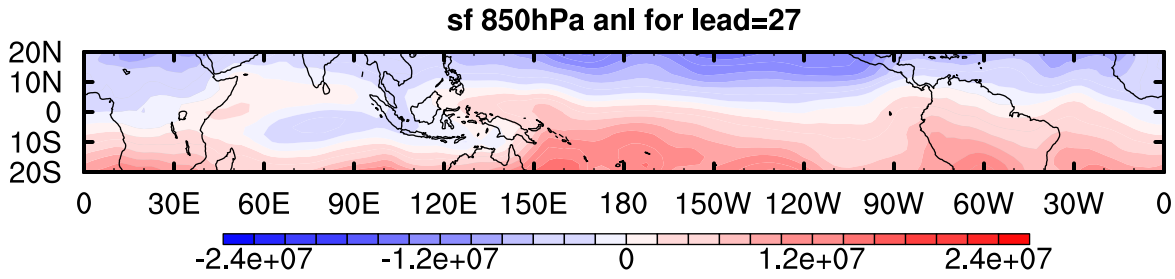
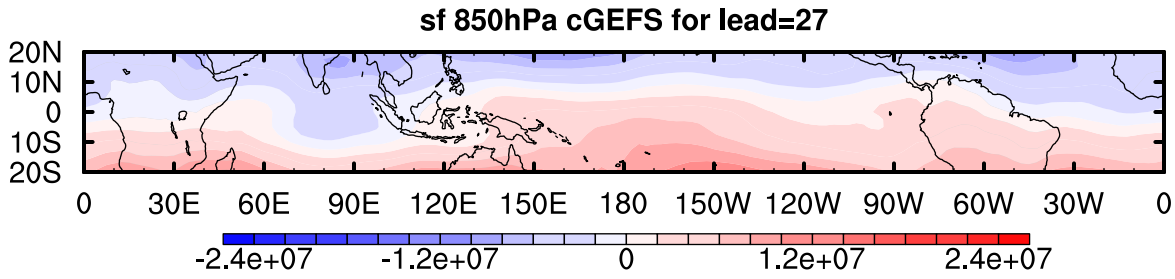

sf 850hPa anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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60W
30W
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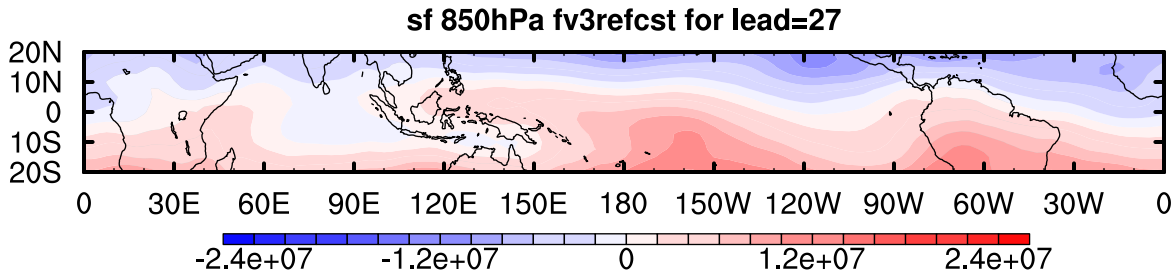
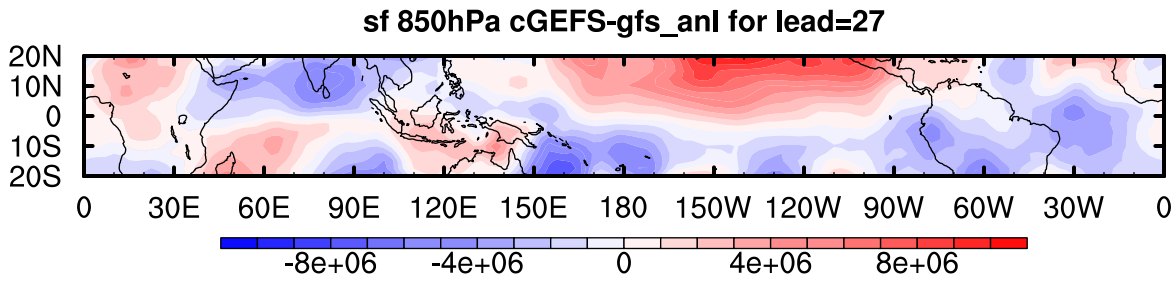
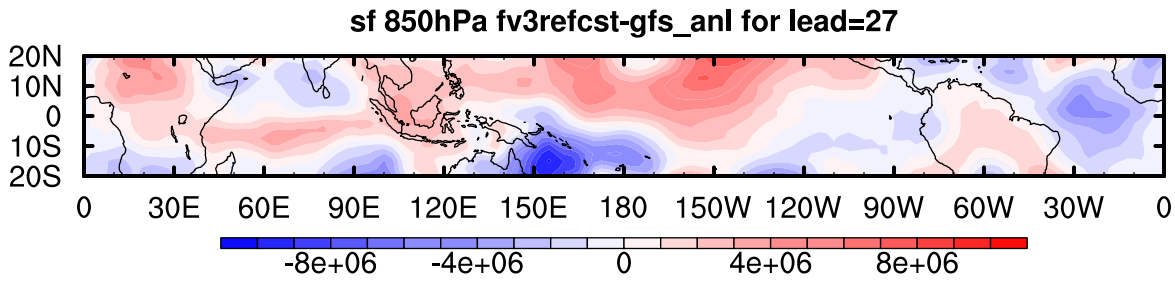
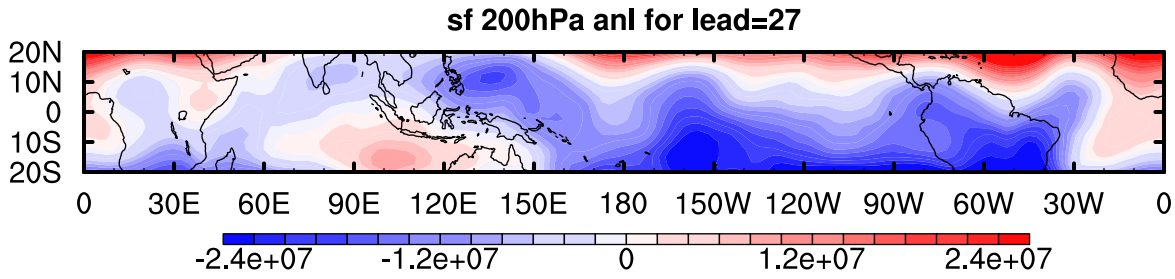
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-1.2e+07
0
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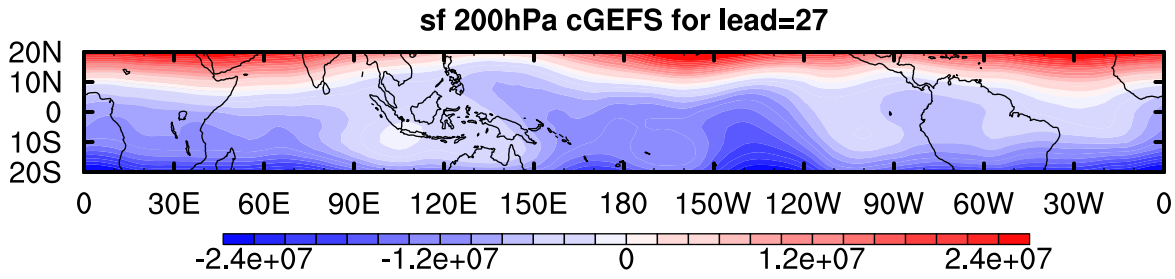
2.4e+07


sf 200hPa cGEFS for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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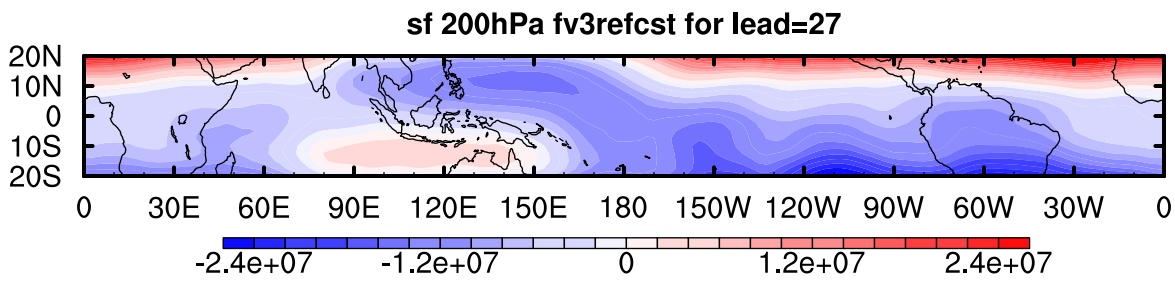
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-1.2e+07
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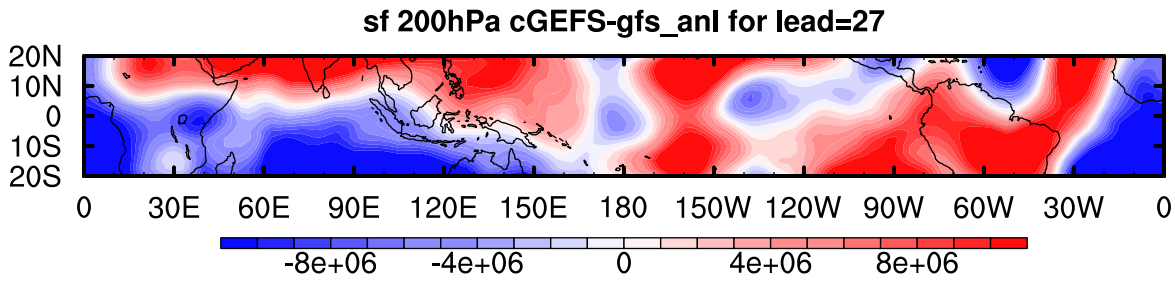
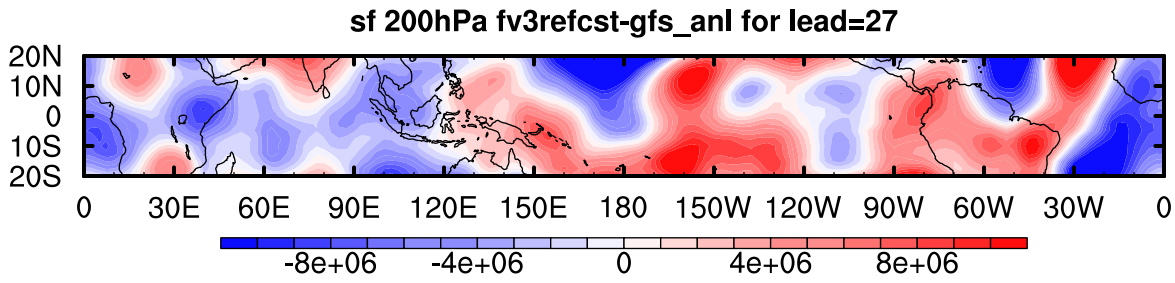
1.2e+07
2.4e+07


sf 200hPa cGEFS-gfs_anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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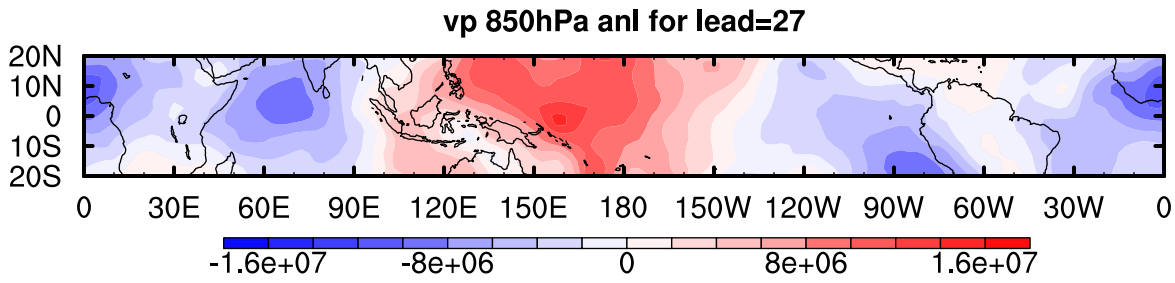
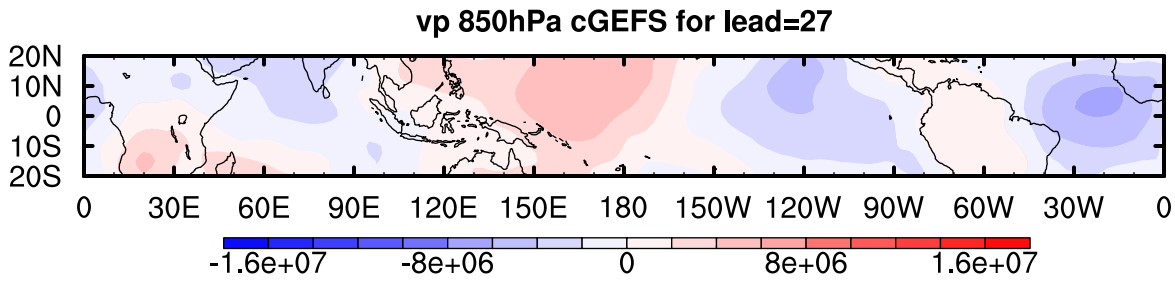
-4e+06
0
4e+06
8e+06


vp 850hPa anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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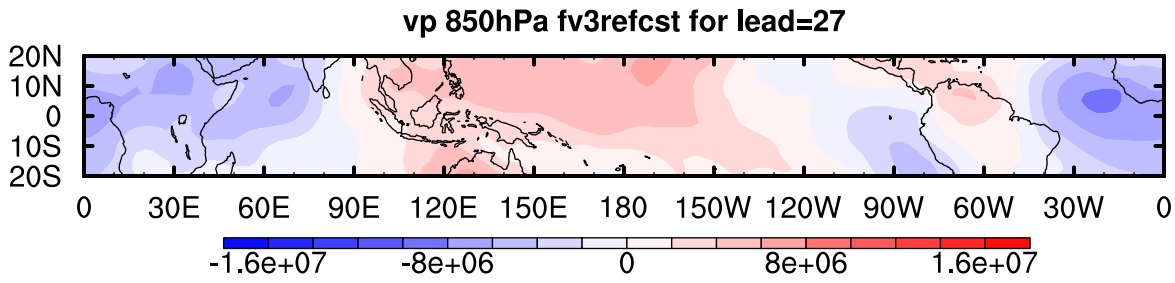
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
90W
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30W
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-1.6e+07
-8e+06
0
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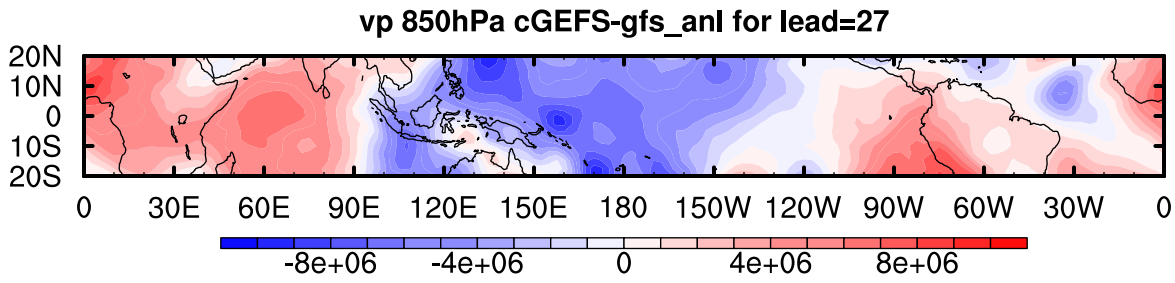
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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180
150W
120W
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30W
0
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-4e+06
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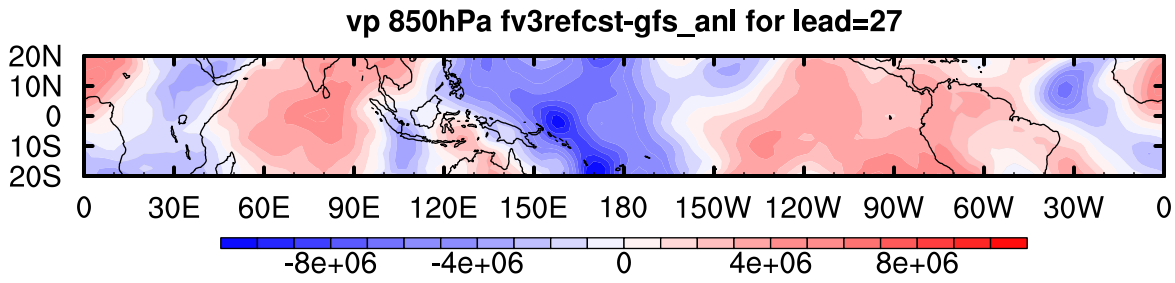
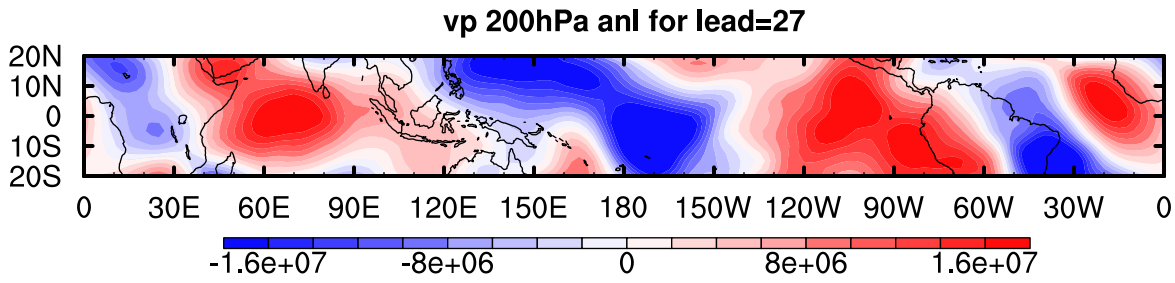
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 200hPa anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-1.6e+07
-8e+06
0
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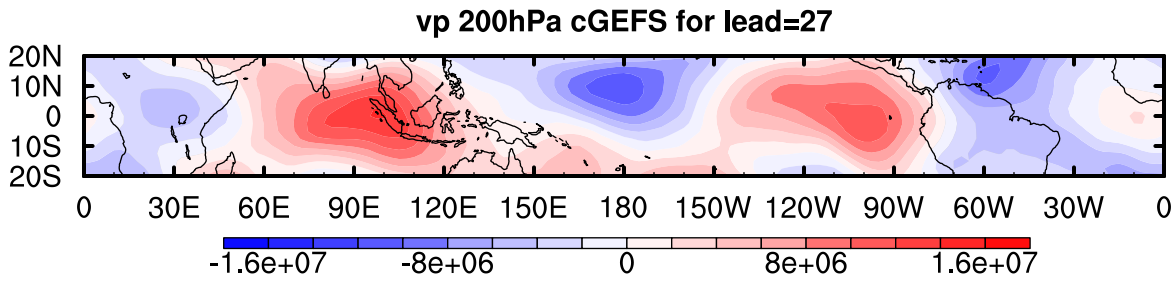
1.6e+07


vp 200hPa cGEFS for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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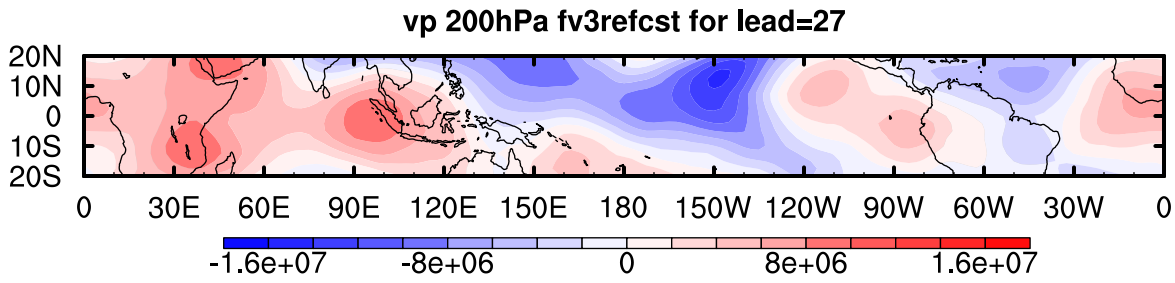
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa fv3refcst for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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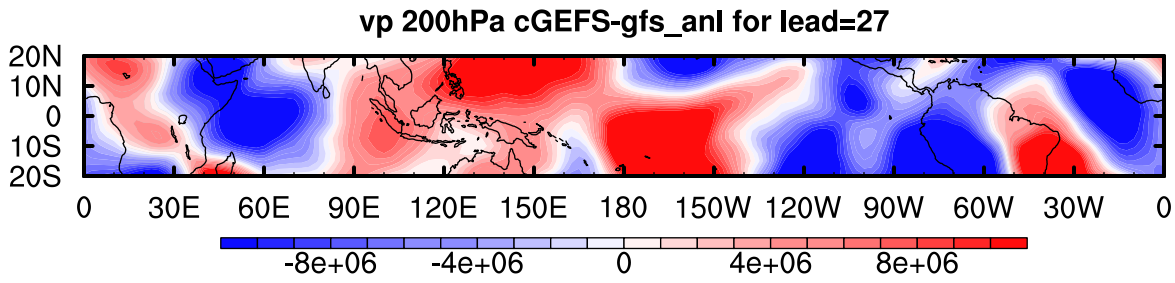
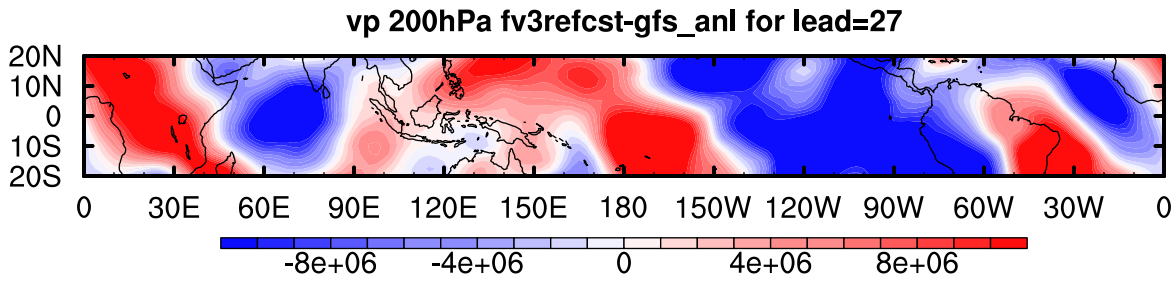
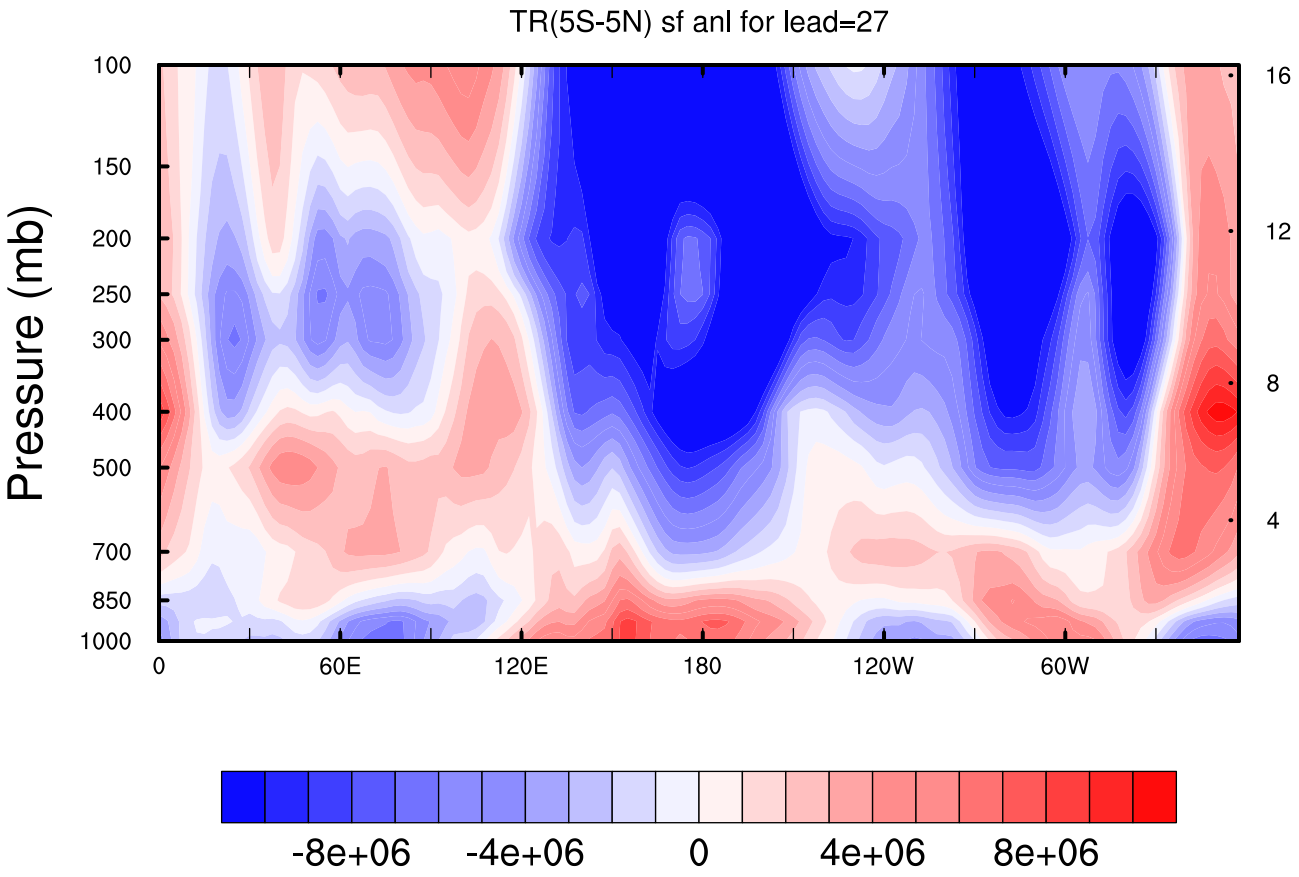
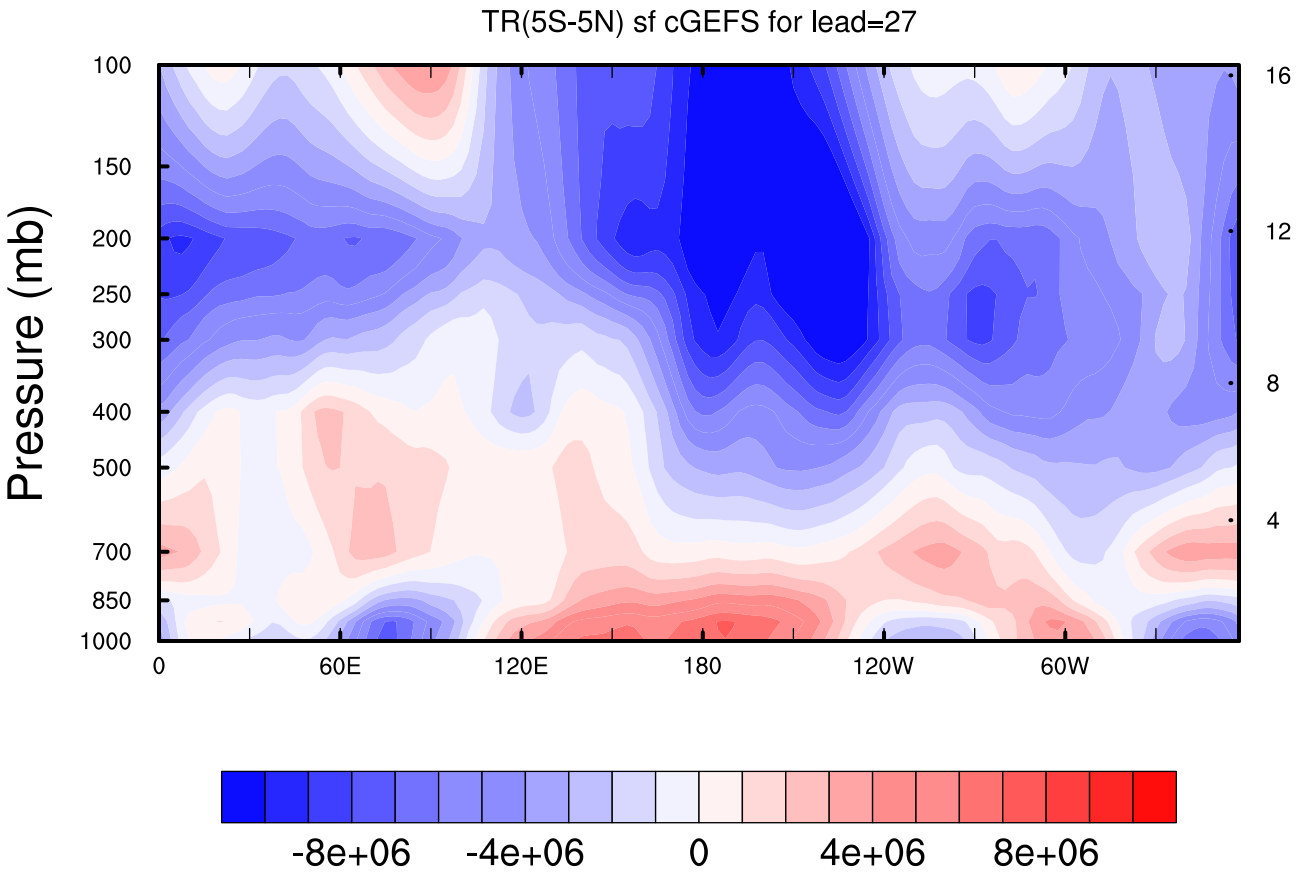
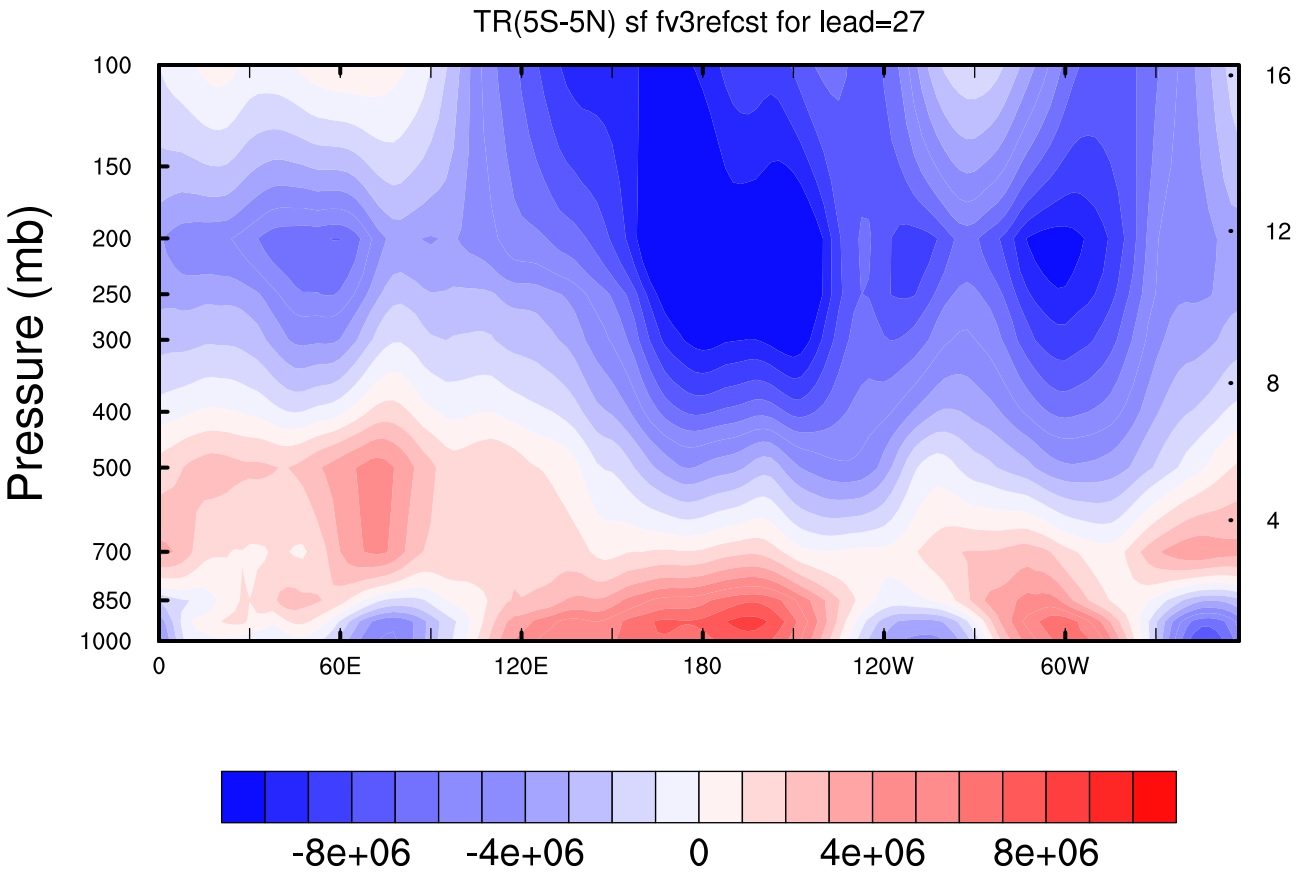
1.6e+07

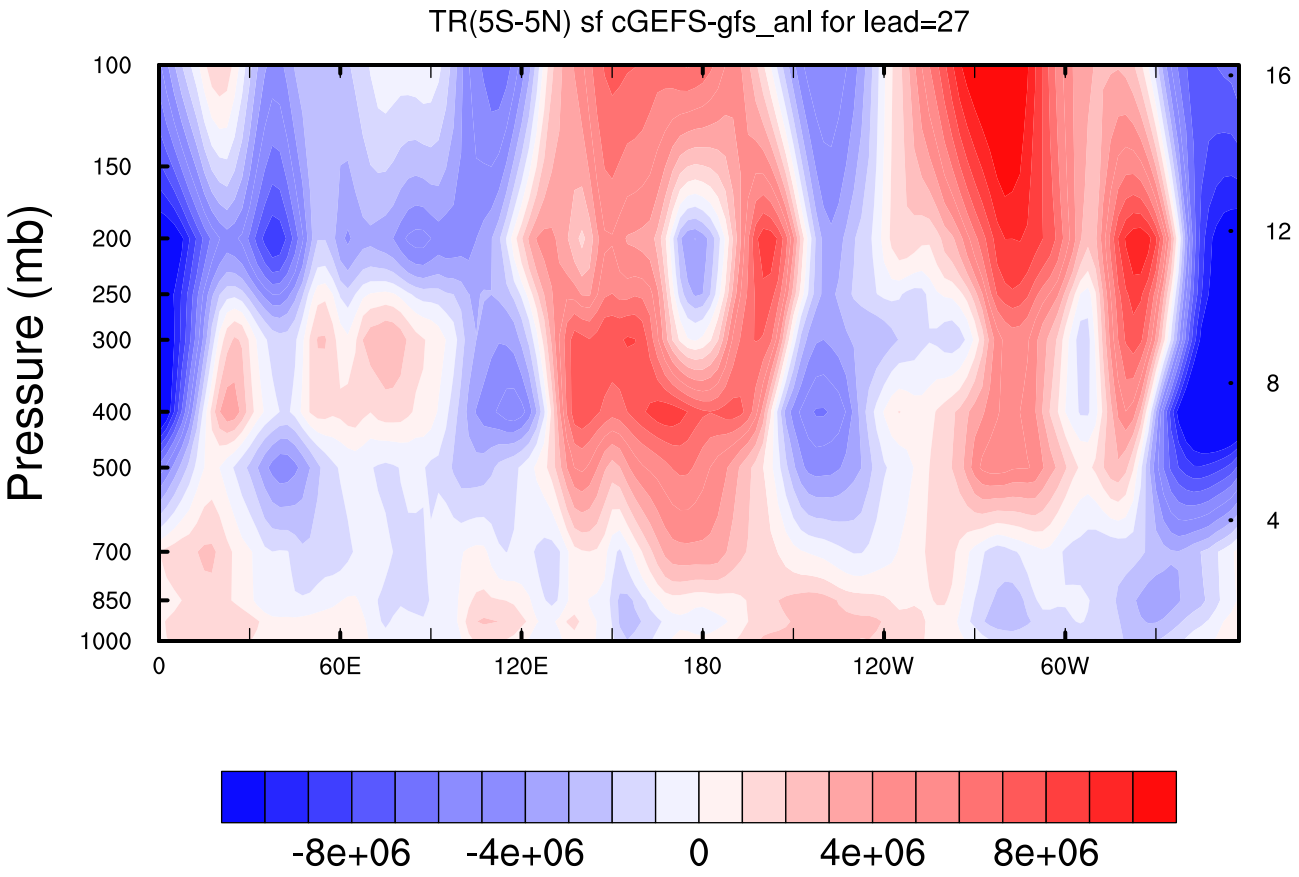

vp 200hPa cGEFS-gfs_anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

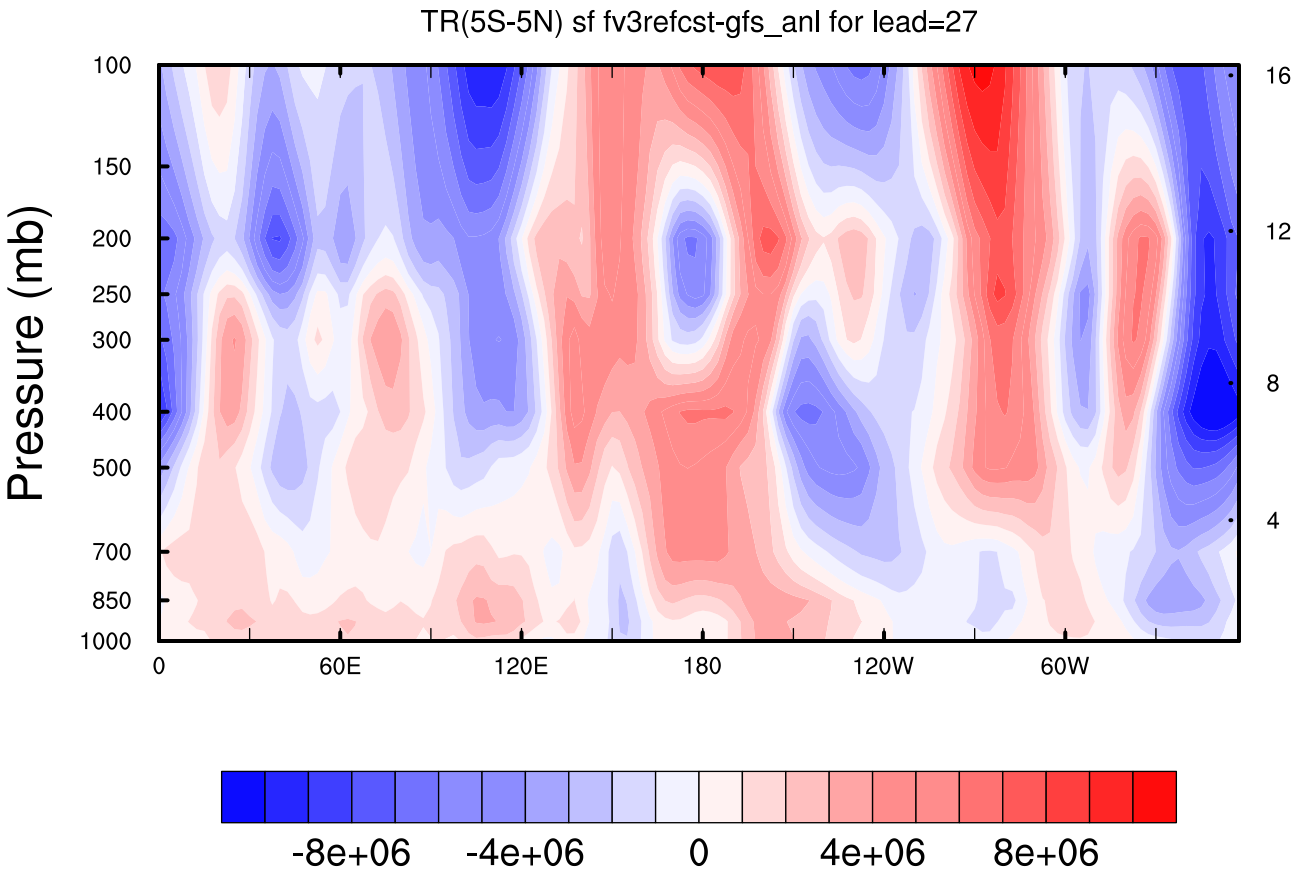

vp 200hPa fv3refcst-gfs_anl for lead=27
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

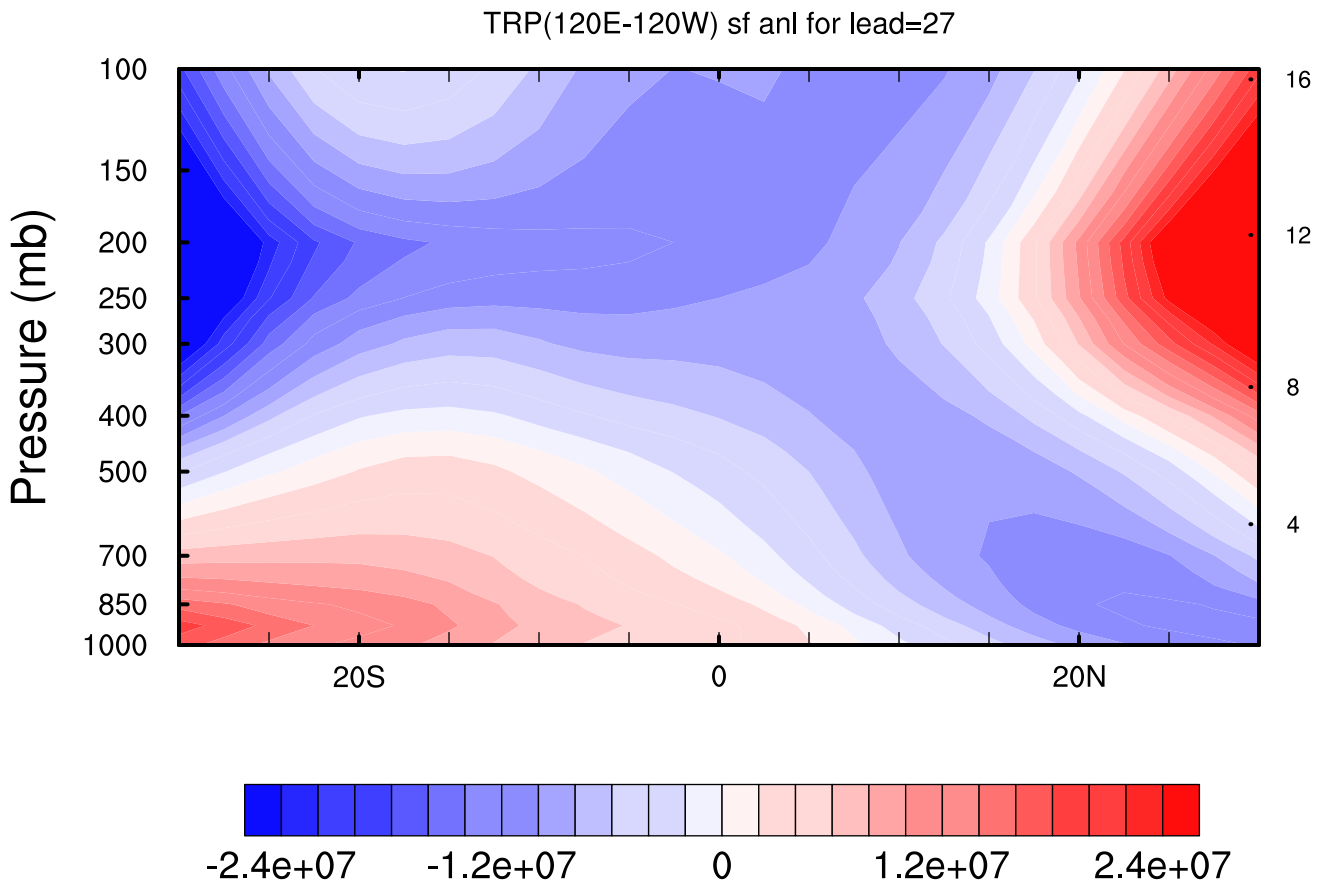

TR(5S-5N) sf anl for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

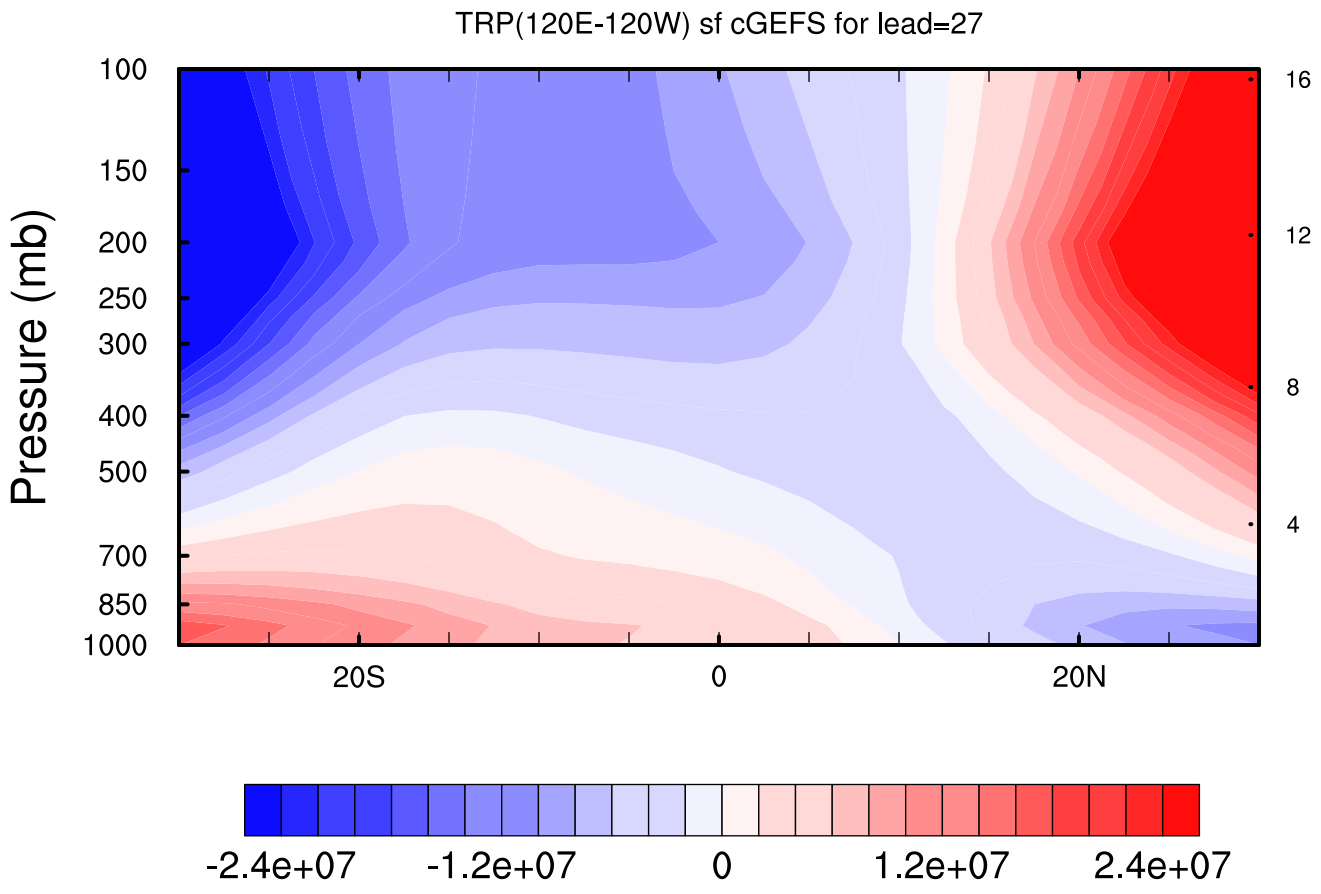

TR(5S-5N) sf cGEFS for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

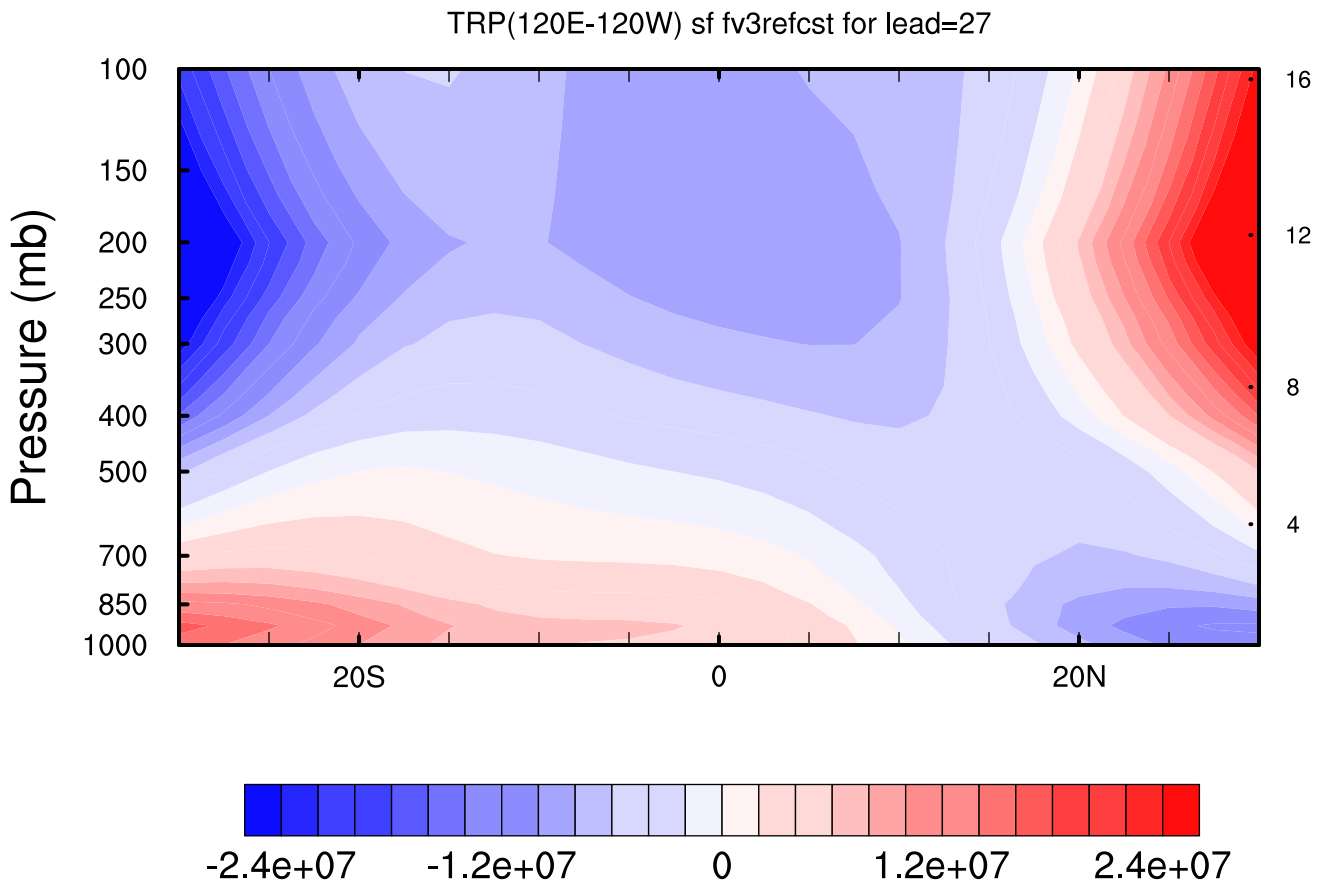

TR(5S-5N) sf fv3refcst for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

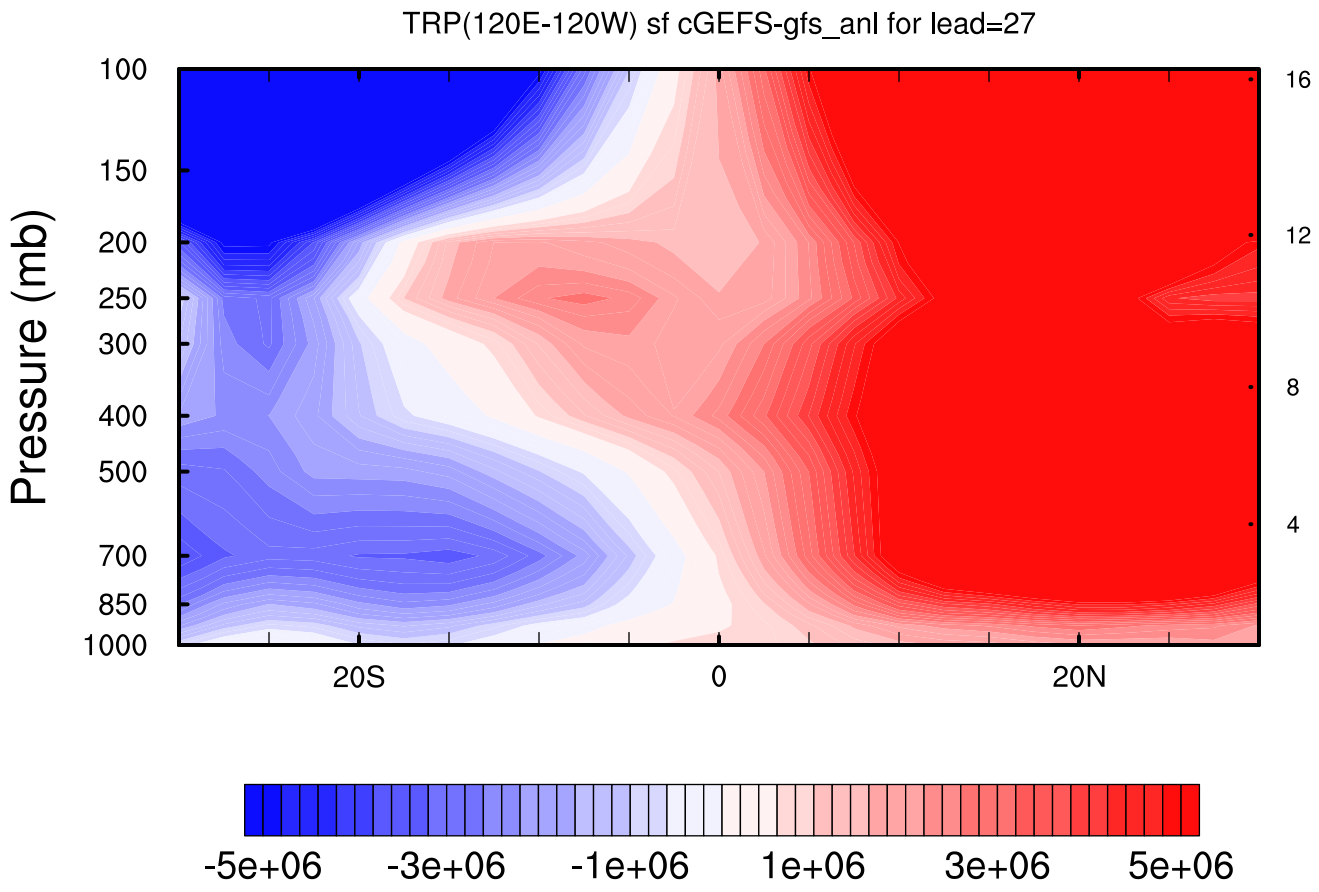

TR(5S-5N) sf cGEFS-gfs_anl for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

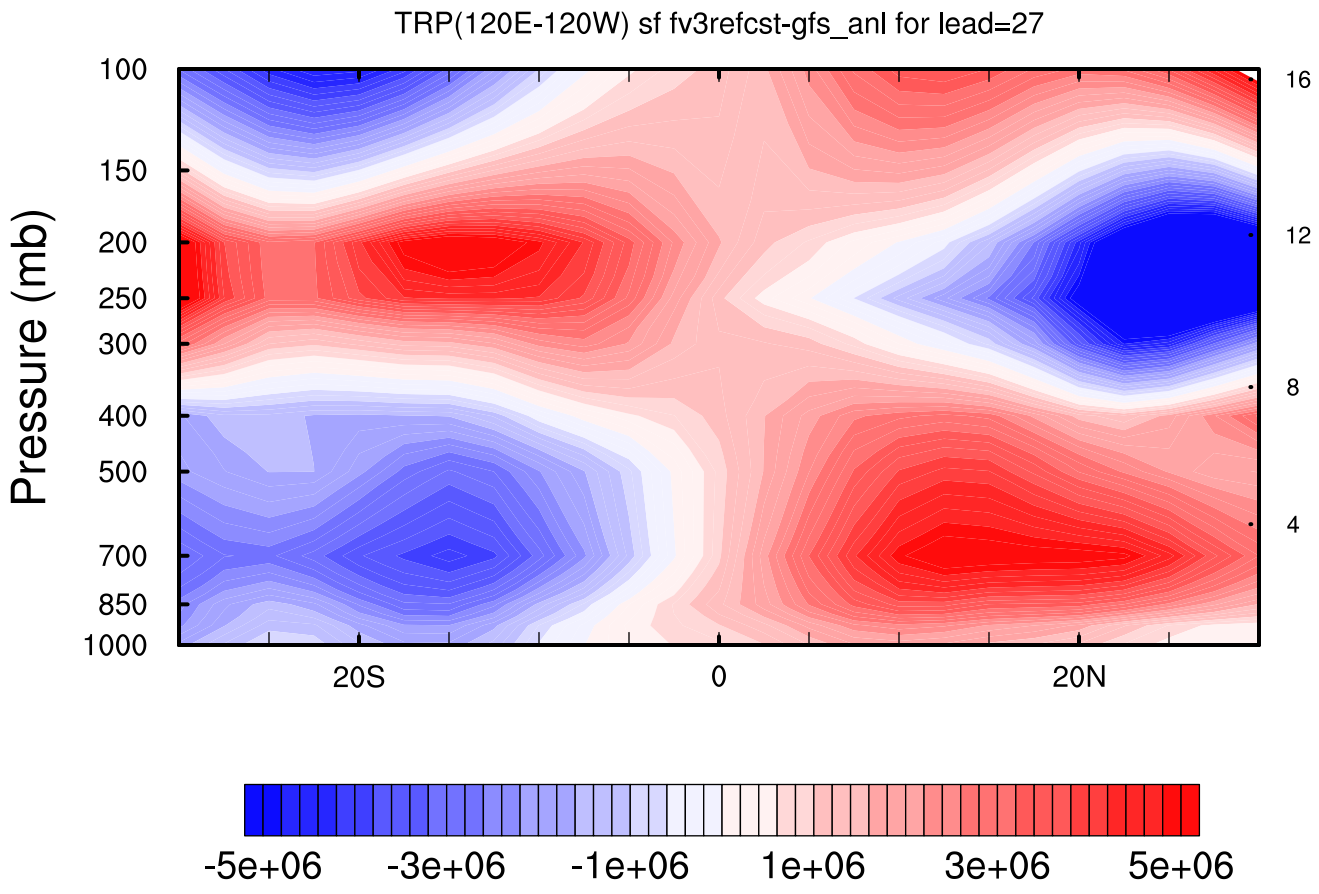

TR(5S-5N) sf fv3refcst-gfs_anl for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

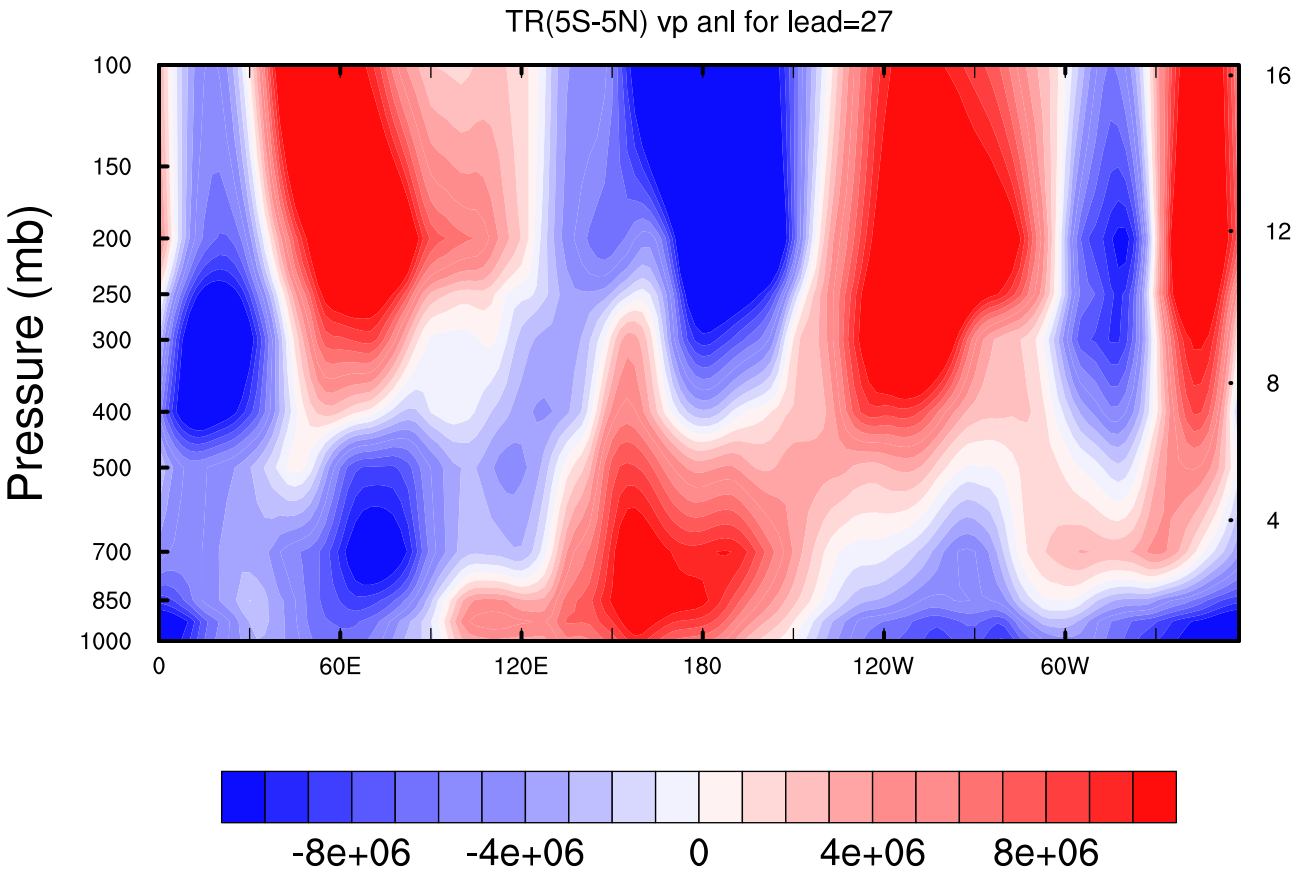

TRP(120E-120W) sf anl for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

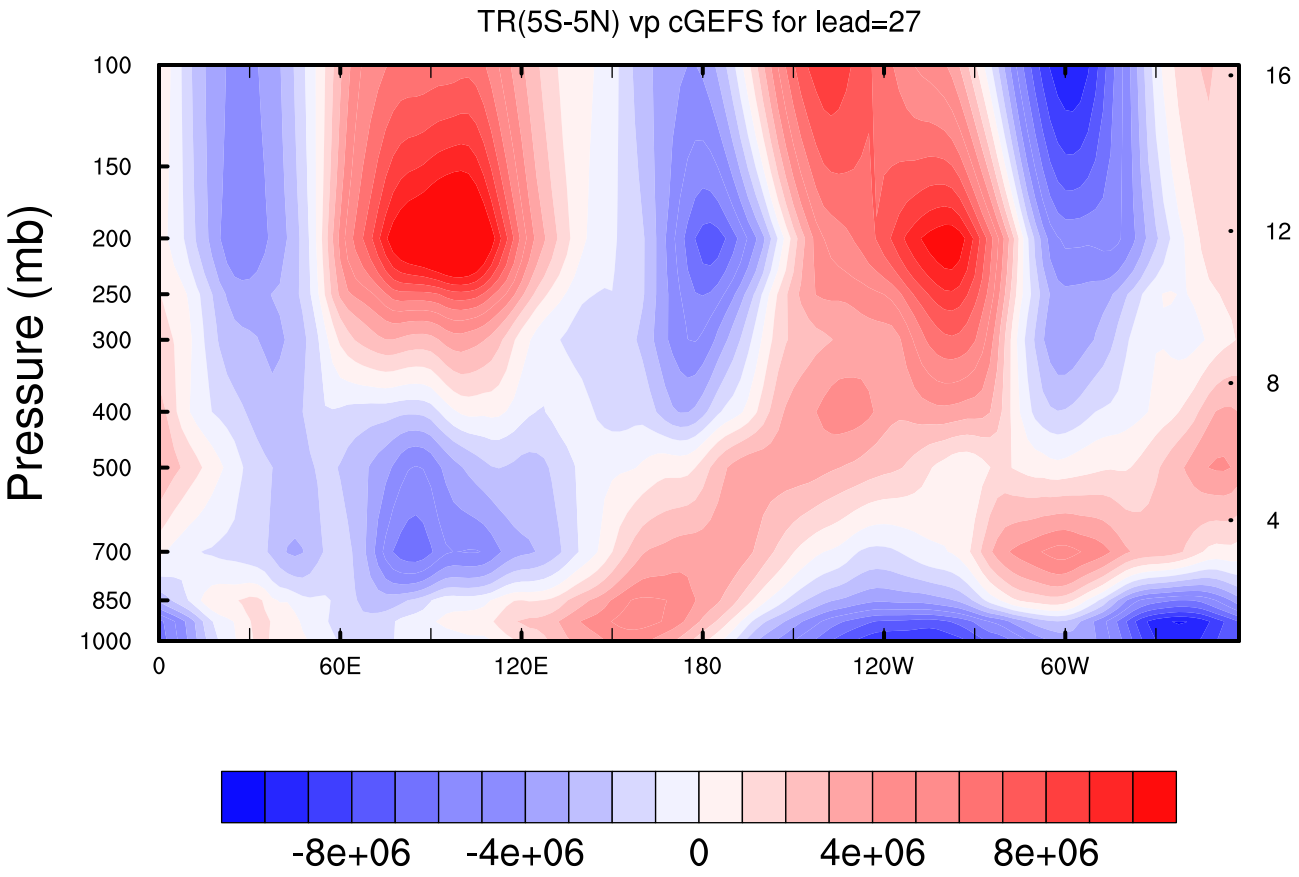

TRP(120E-120W) sf cGEFS for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

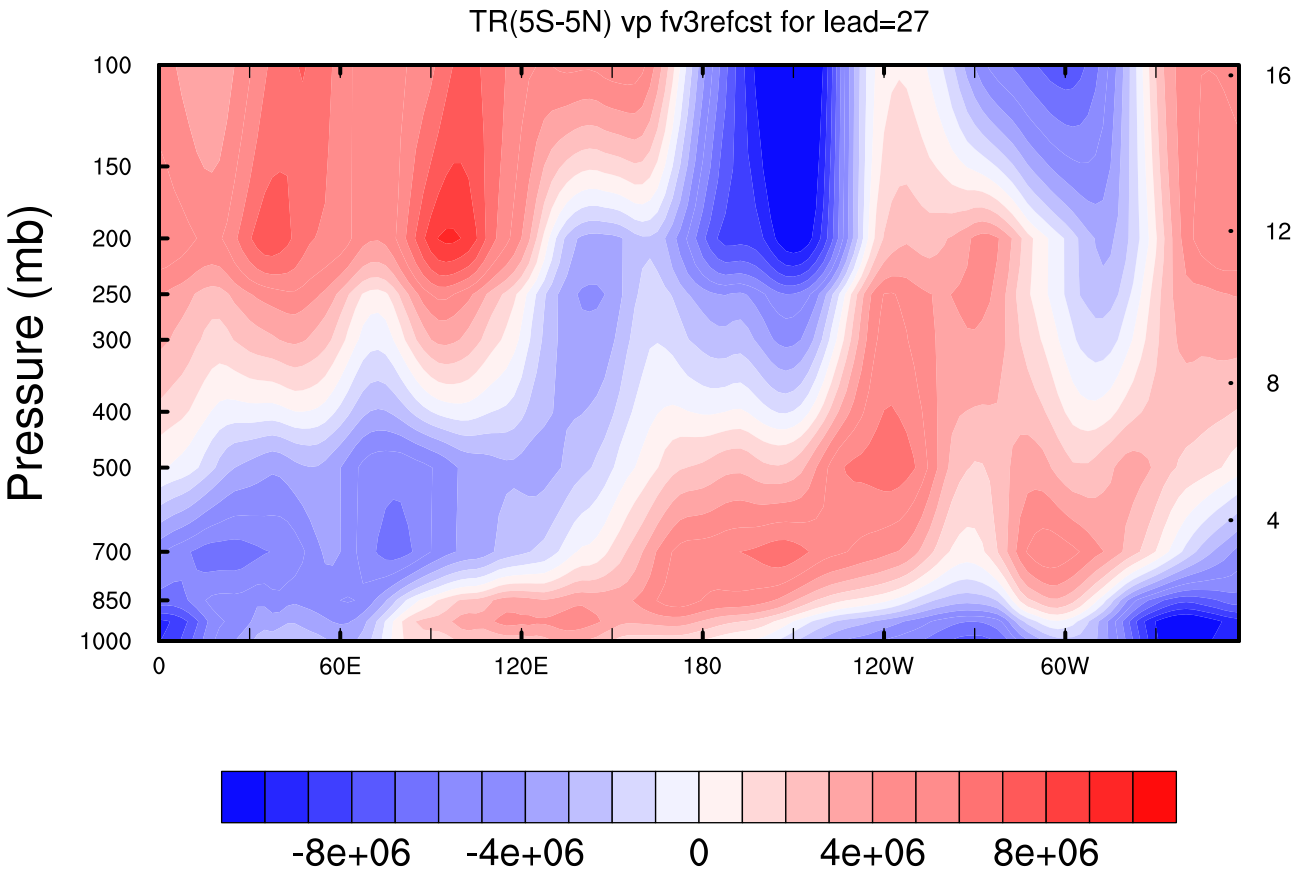

TRP(120E-120W) sf fv3refcst for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

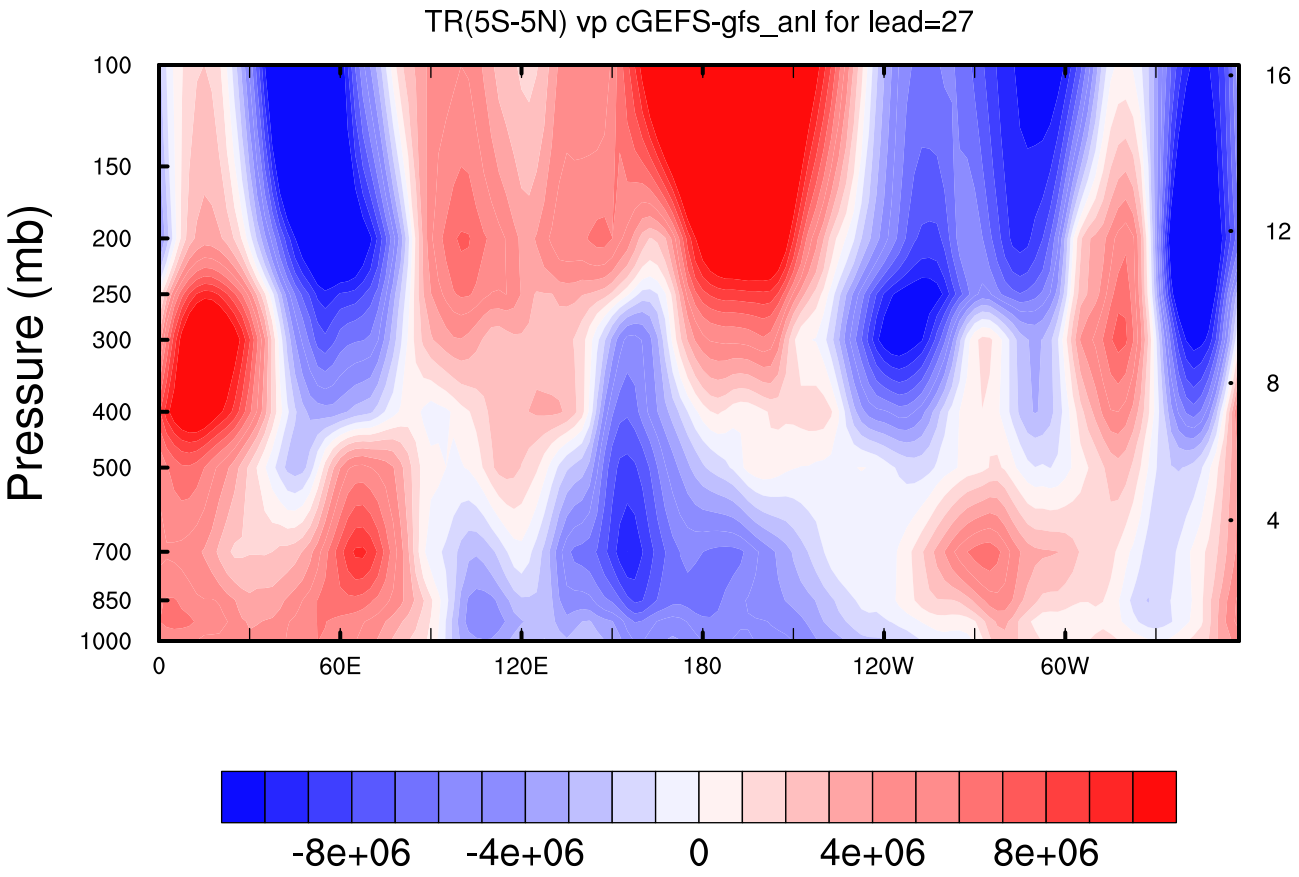

TRP(120E-120W) sf cGEFS-gfs_anl for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

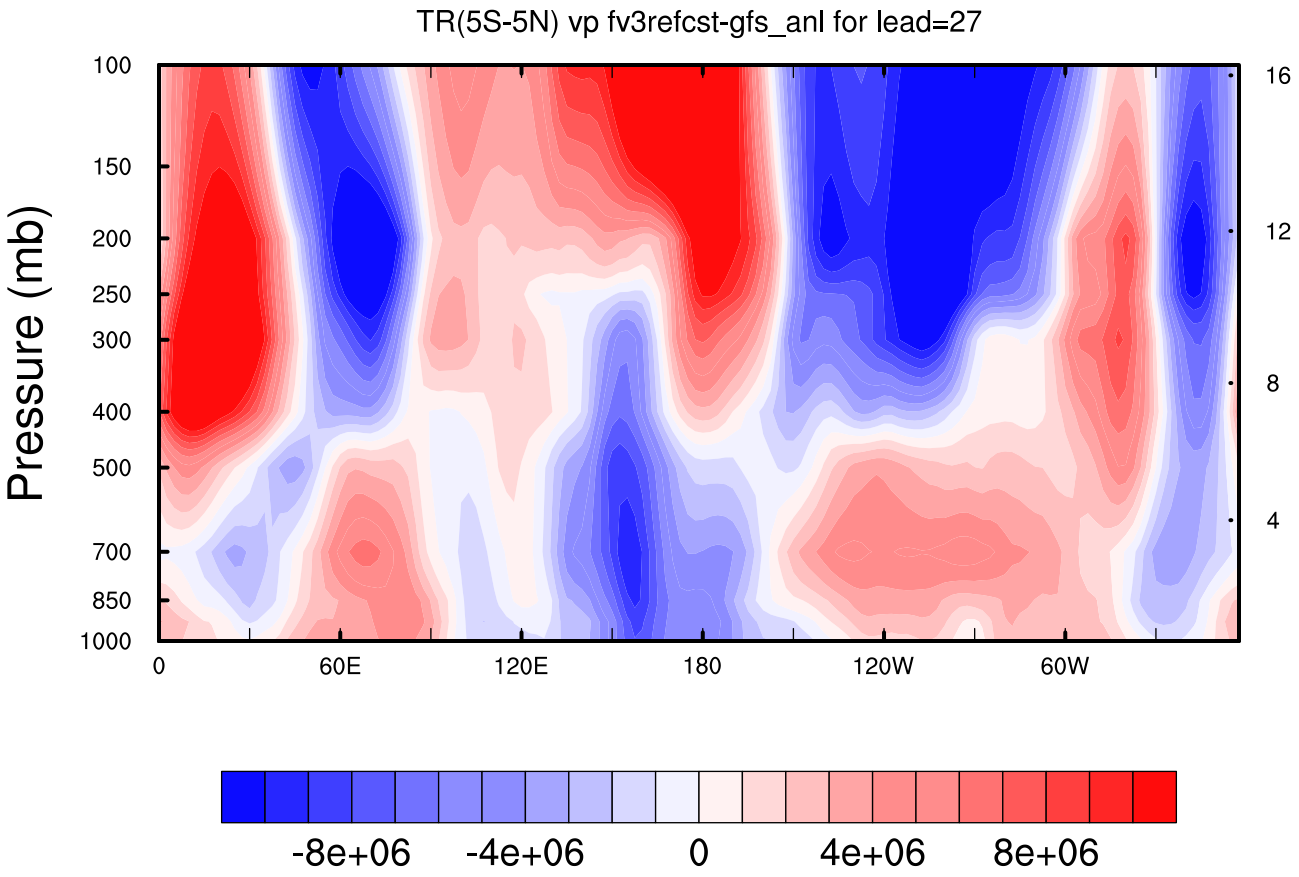

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

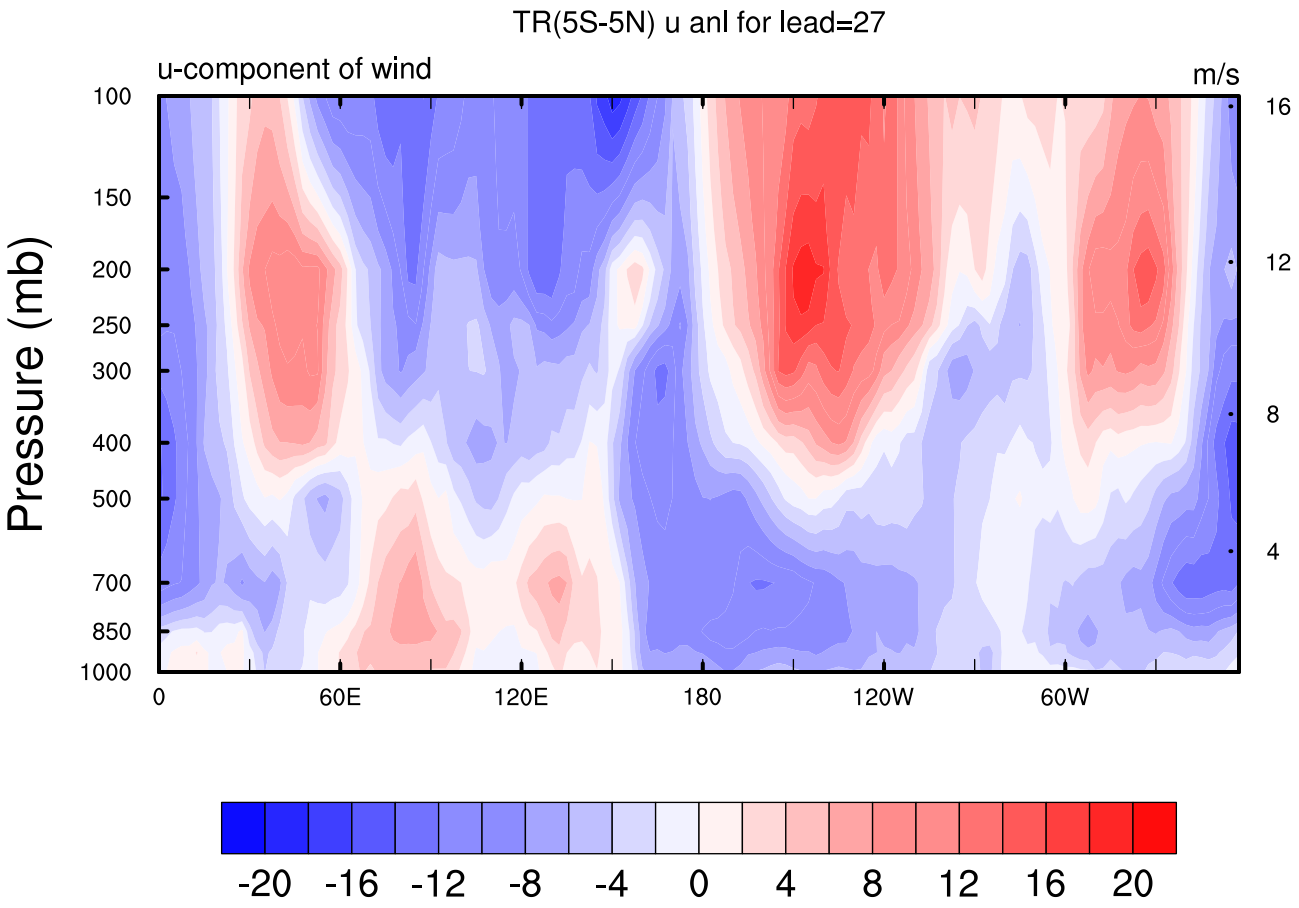

TR(5S-5N) vp anl for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

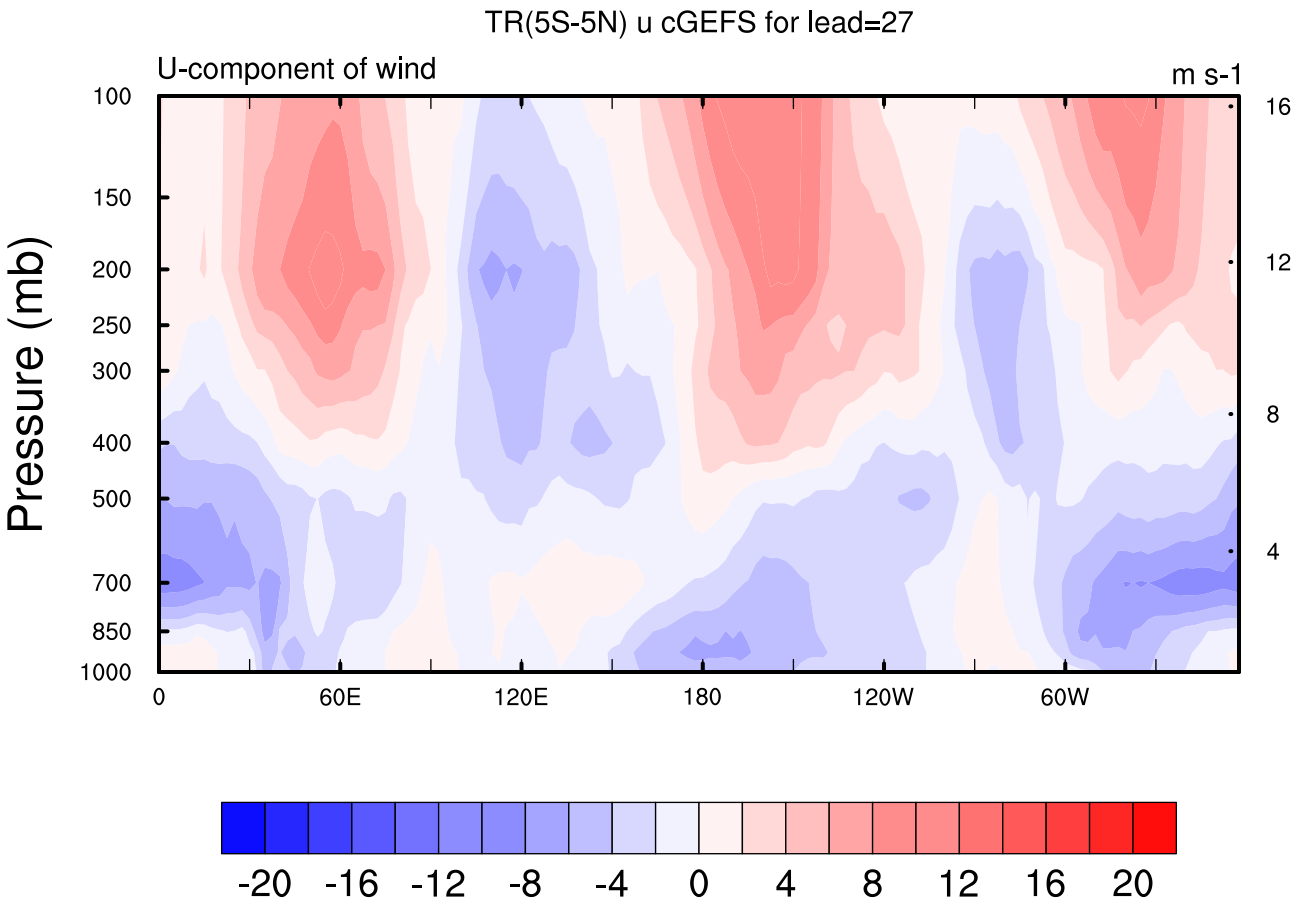

TR(5S-5N) vp cGEFS for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

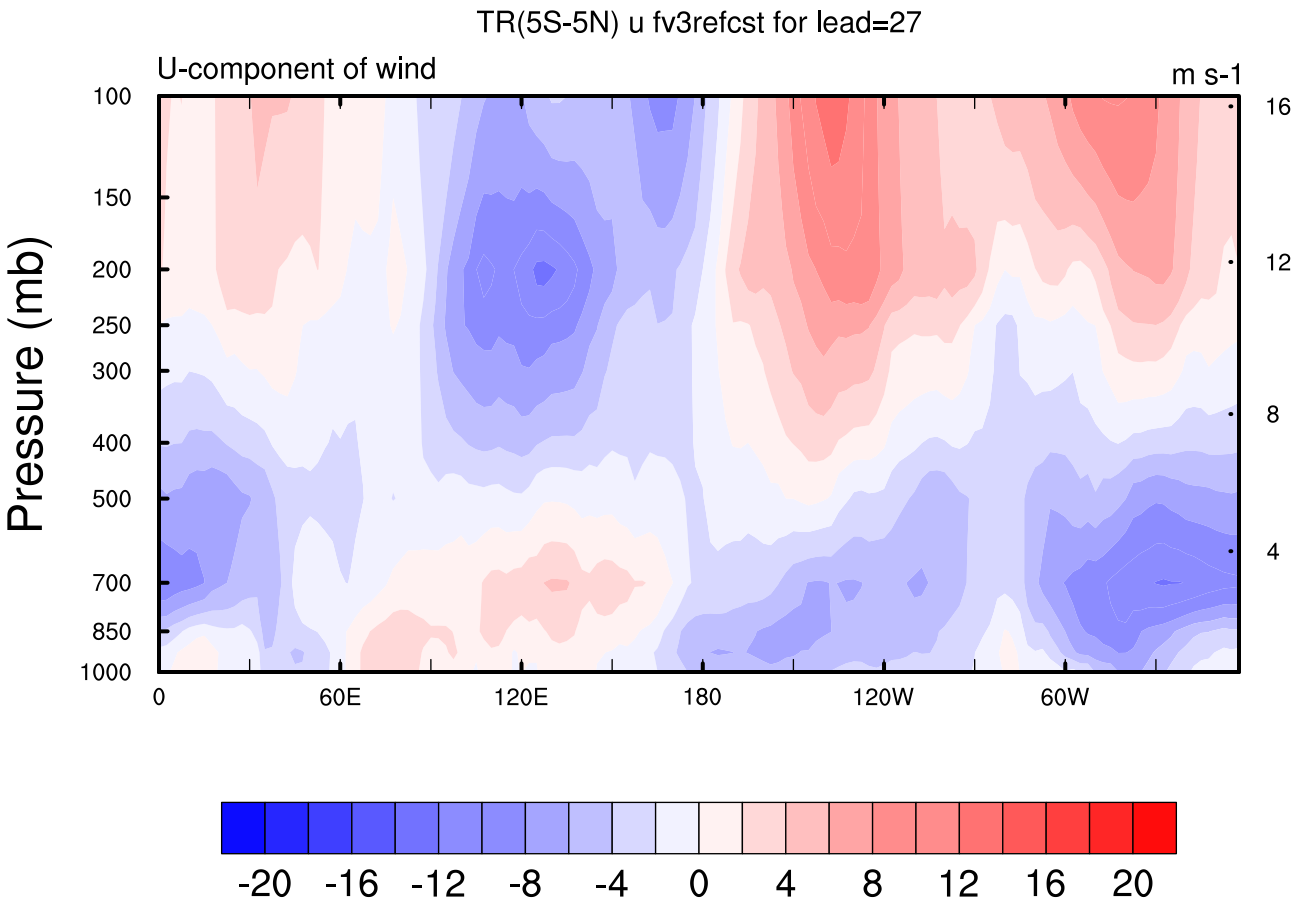

TR(5S-5N) vp fv3refcst for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

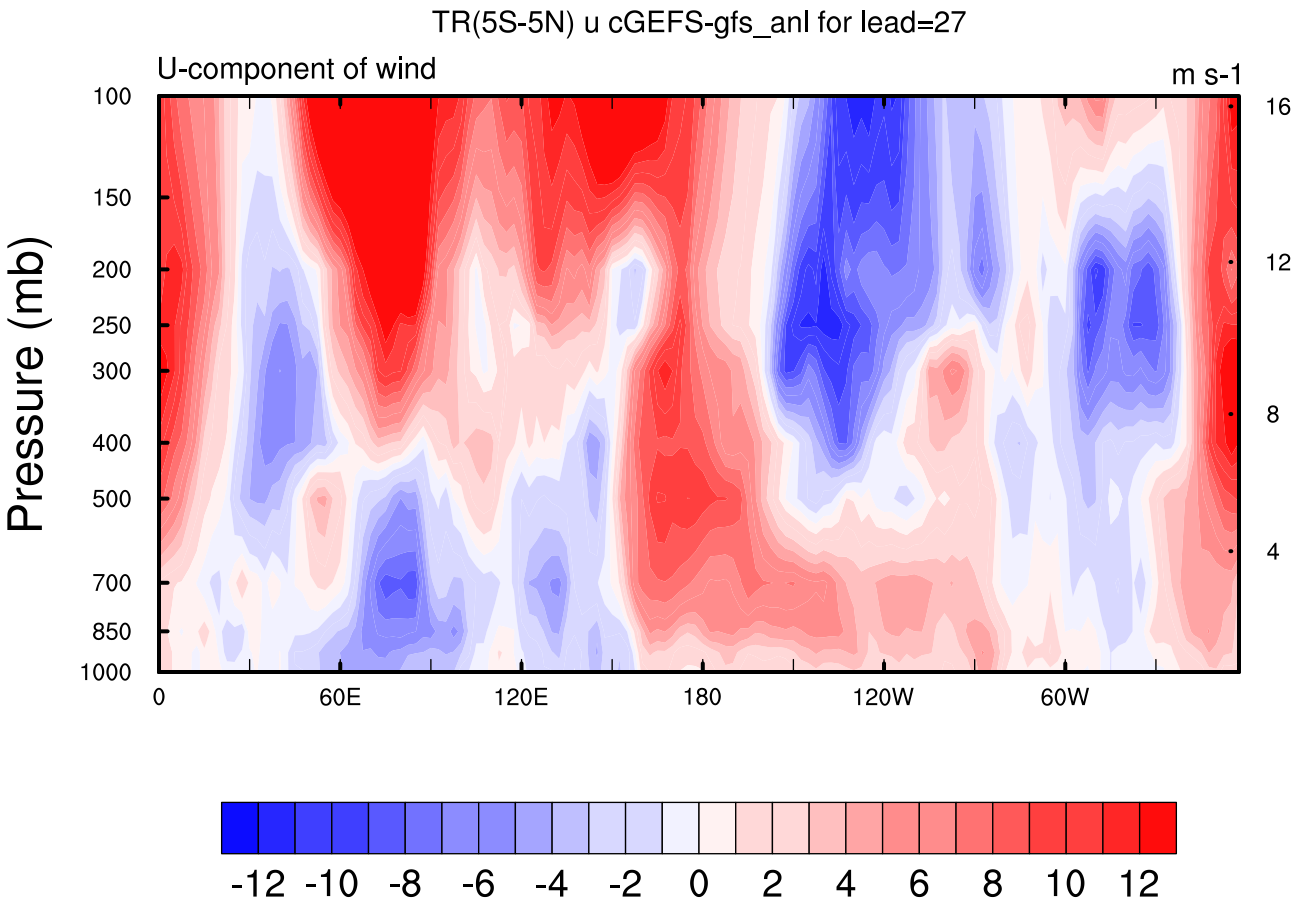

TR(5S-5N) vp cGEFS-gfs_anl for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

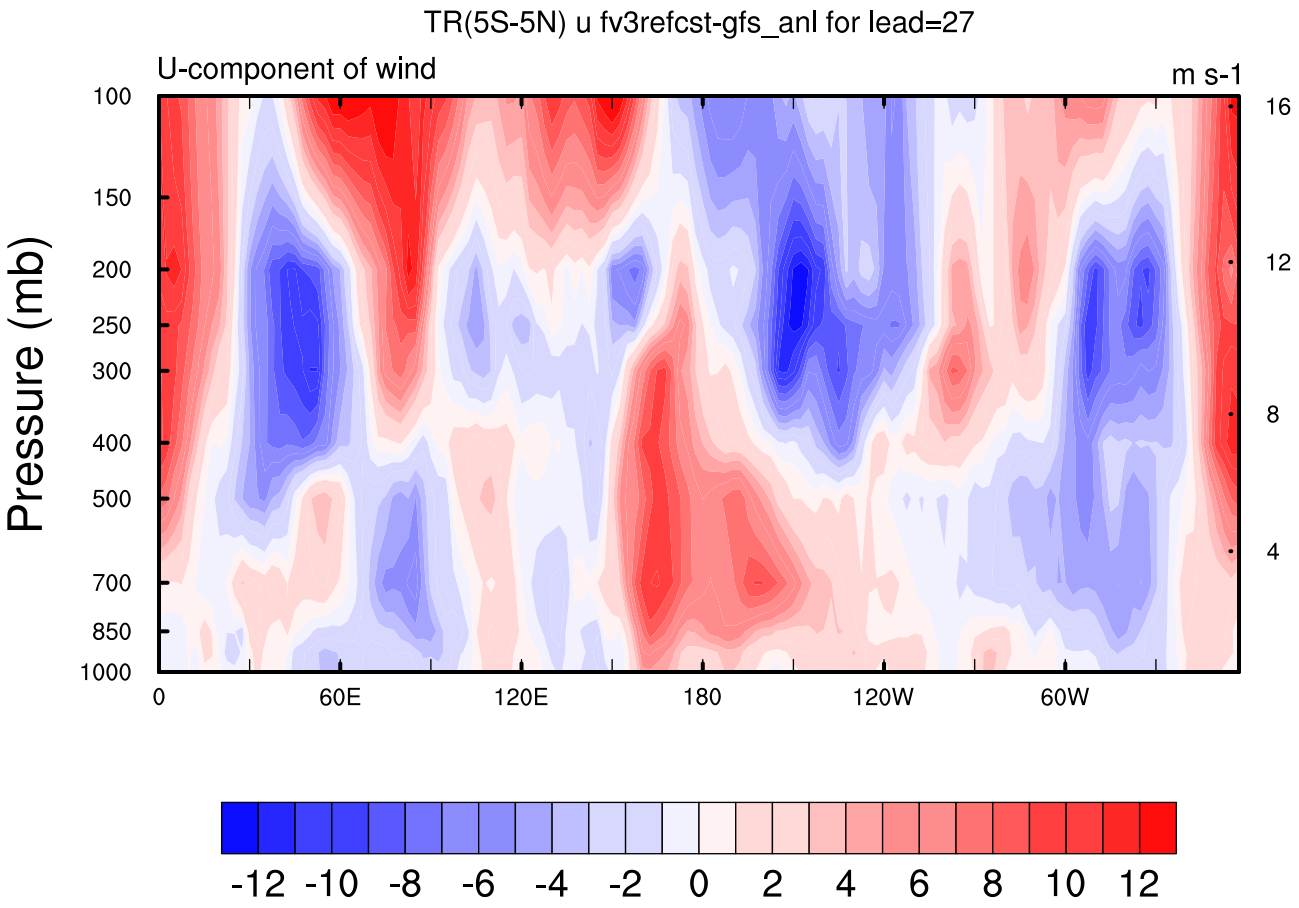

TR(5S-5N) vp fv3refcst-gfs_anl for lead=27
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

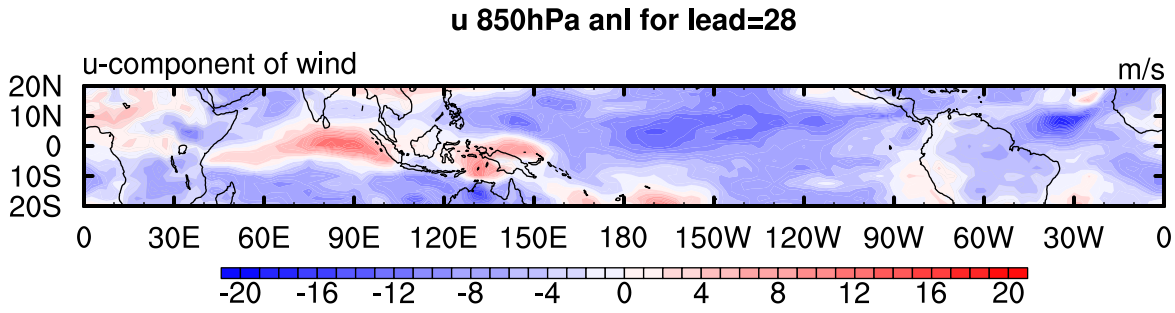

TR(5S-5N) u anl for lead=27
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

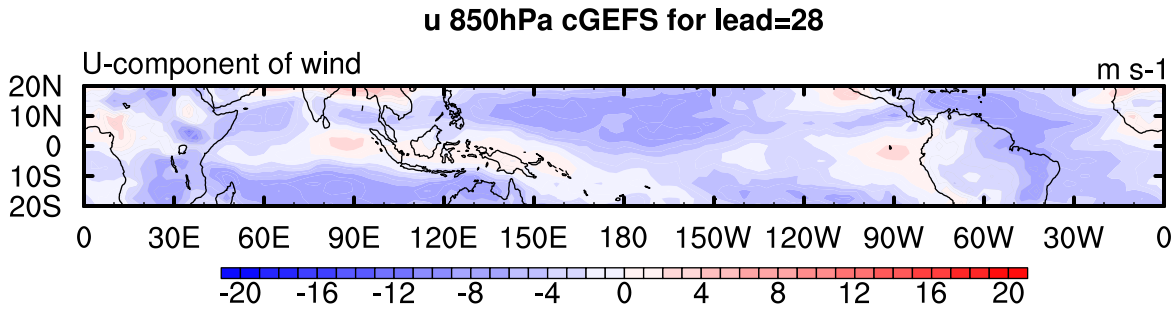

TR(5S-5N) u cGEFS for lead=27
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

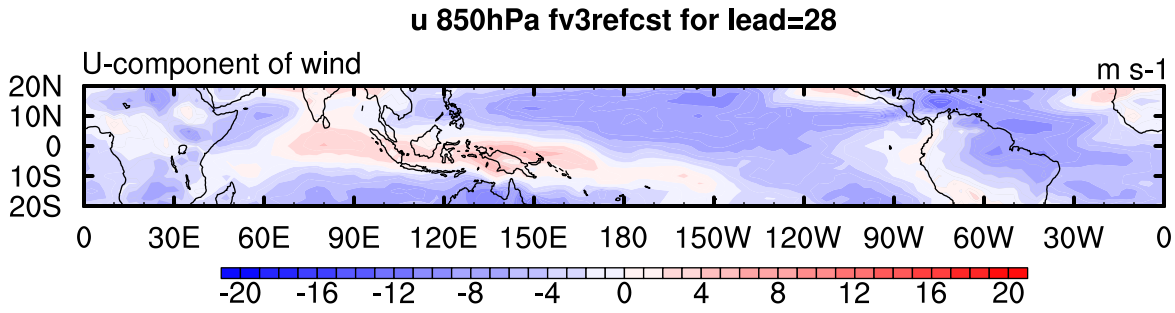

TR(5S-5N) u fv3refcst for lead=27
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

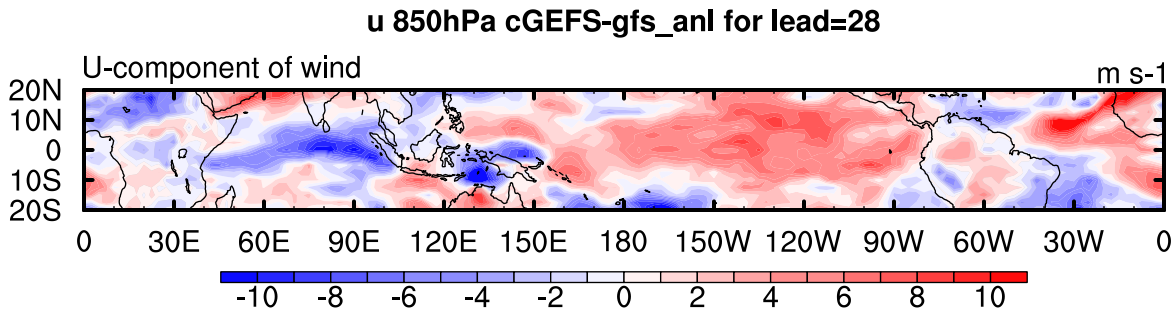

TR(5S-5N) u cGEFS-gfs_anl for lead=27
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

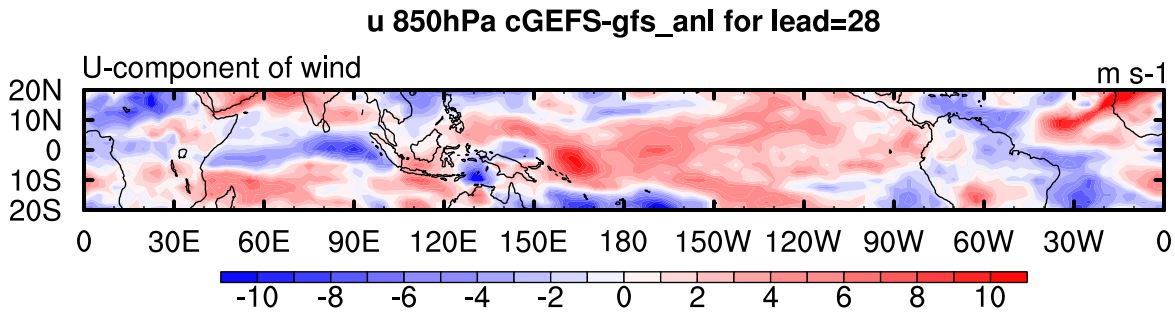

TR(5S-5N) u fv3refcst-gfs_anl for lead=27
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

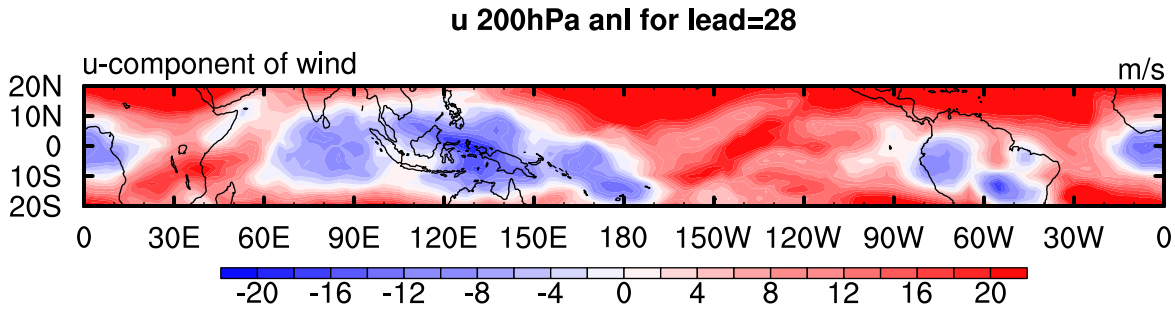

u 850hPa anl for lead=28
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

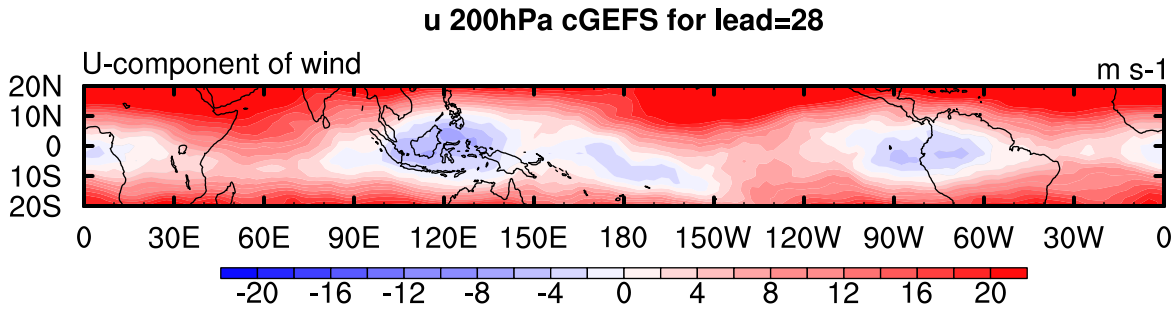

u 850hPa cGEFS for lead=28
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

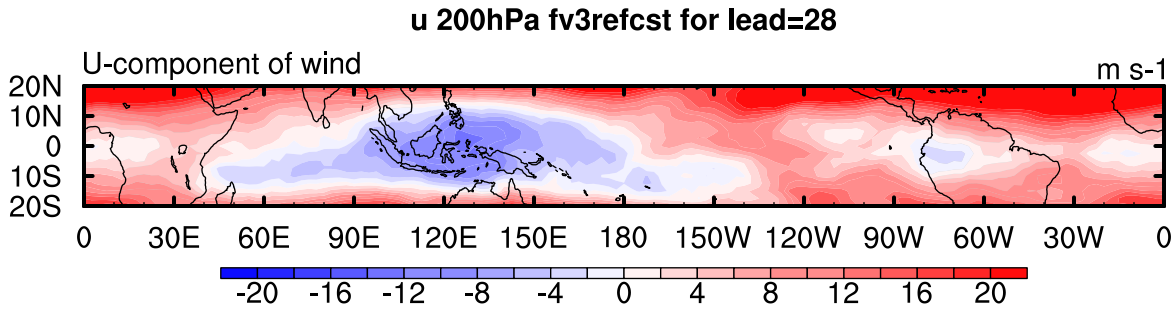

u 850hPa fv3refcst for lead=28
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

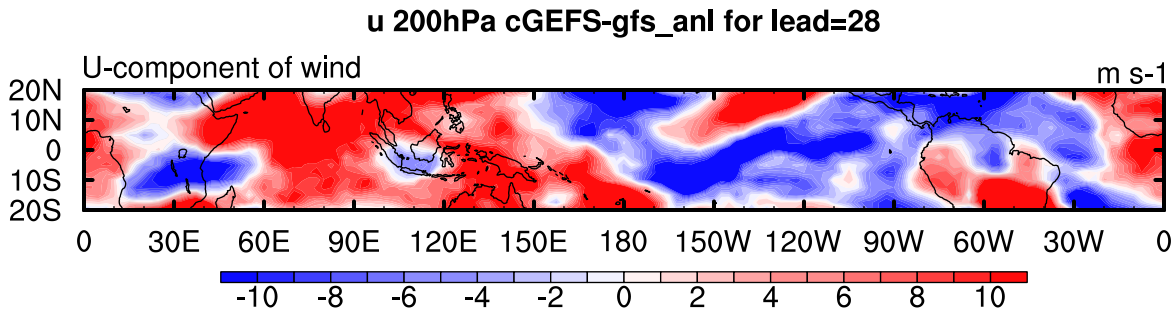

u 850hPa cGEFS-gfs_anl for lead=28
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

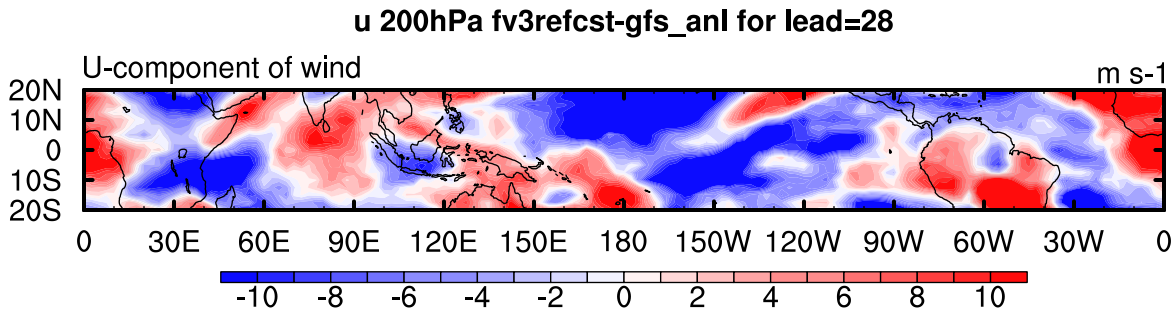

u 850hPa cGEFS-gfs_anl for lead=28
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=28
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=28
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=28
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS-gfs_anl for lead=28
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=28
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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60W
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-10
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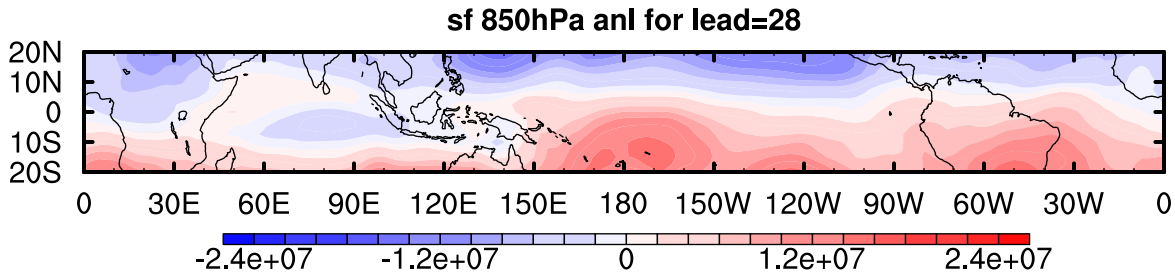
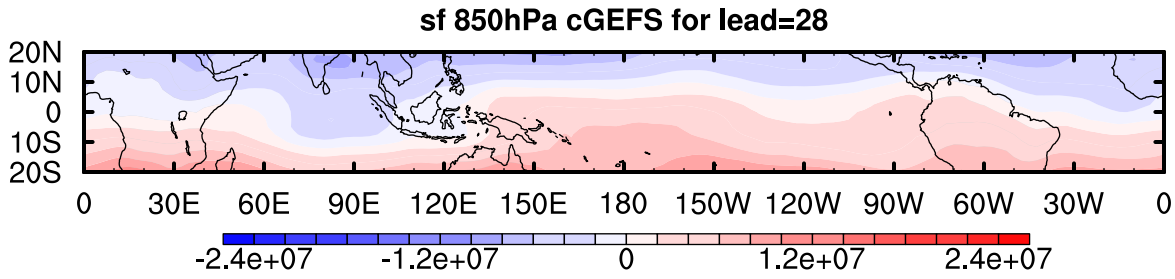

sf 850hPa anl for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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120W
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30W
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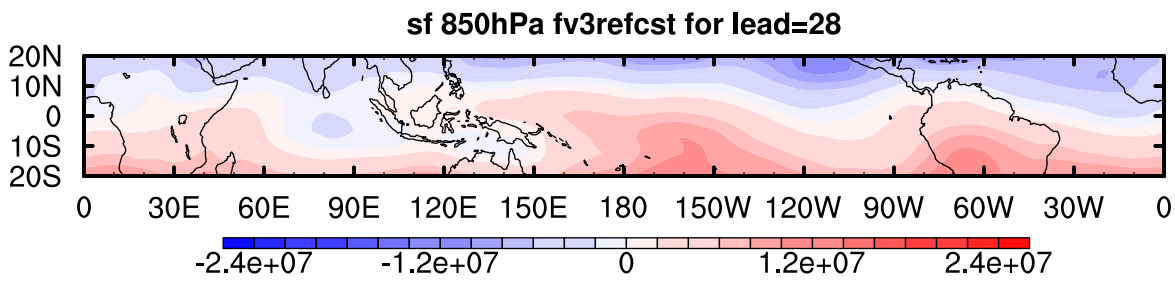
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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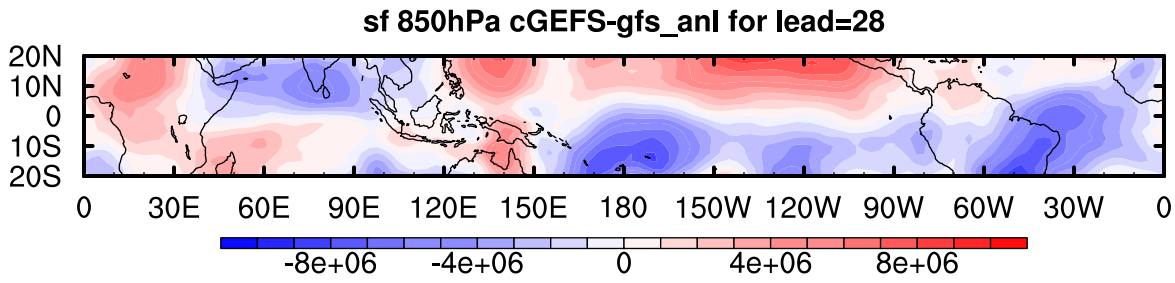
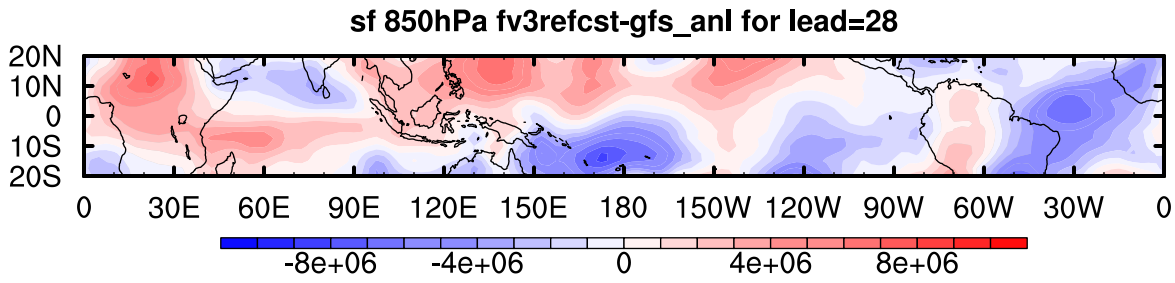
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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90W
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30W
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-4e+06
0
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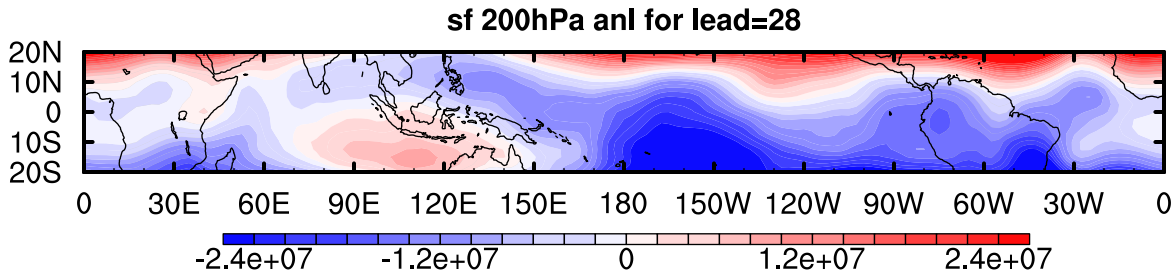
8e+06


sf 200hPa anl for lead=28
20N
10N
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10S
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30E
60E
90E
120E
150E
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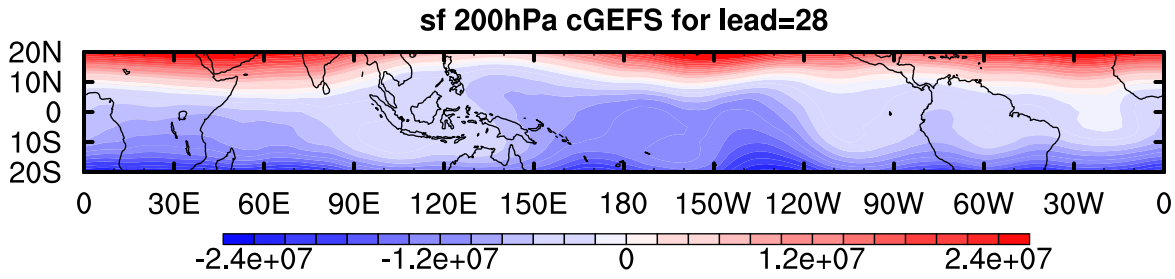
sf 200hPa cGEFS for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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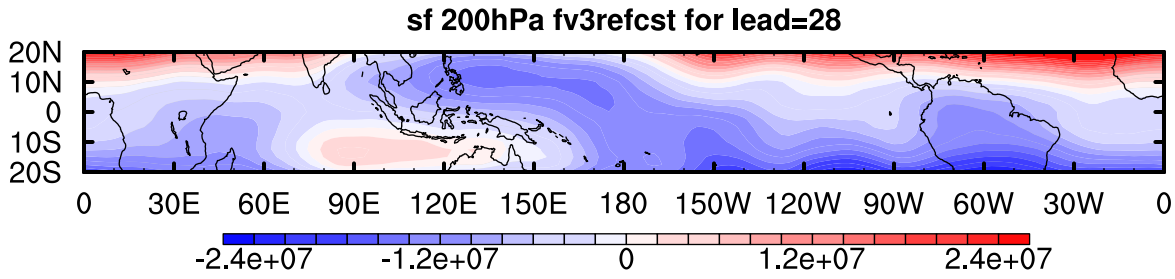
sf 200hPa fv3refcst for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
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30W
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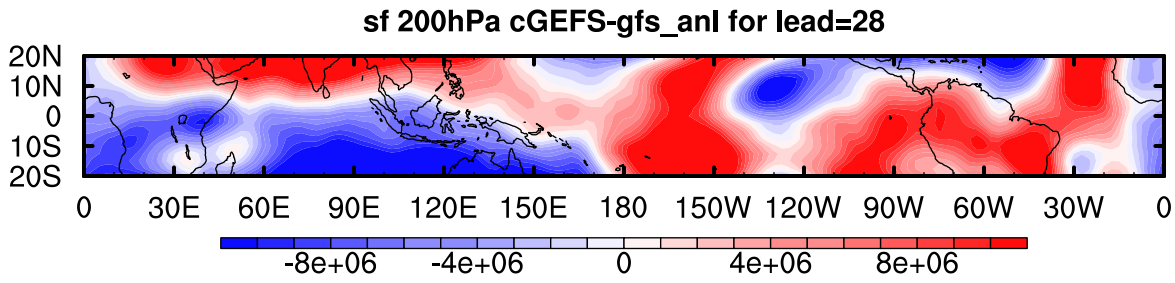
sf 200hPa cGEFS-gfs_anl for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
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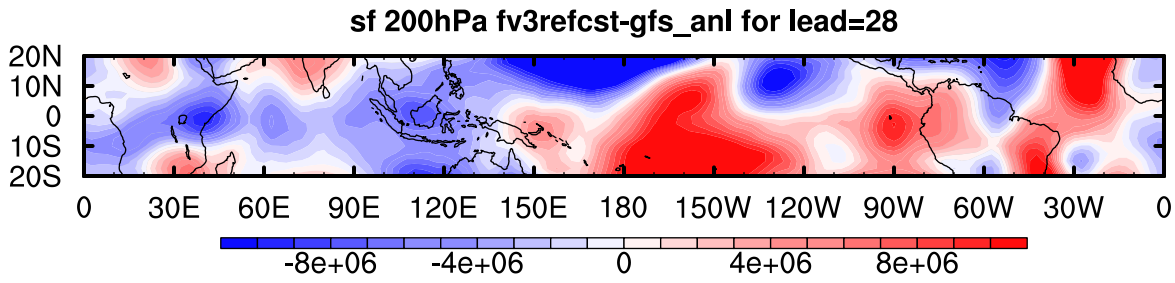
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
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120W
90W
60W
30W
0
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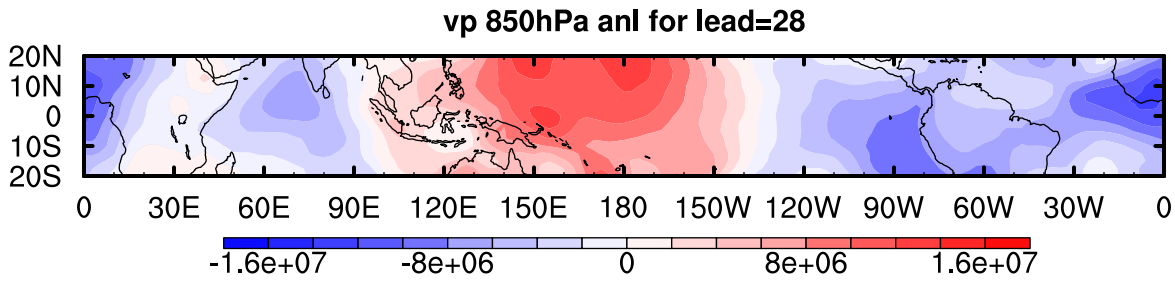
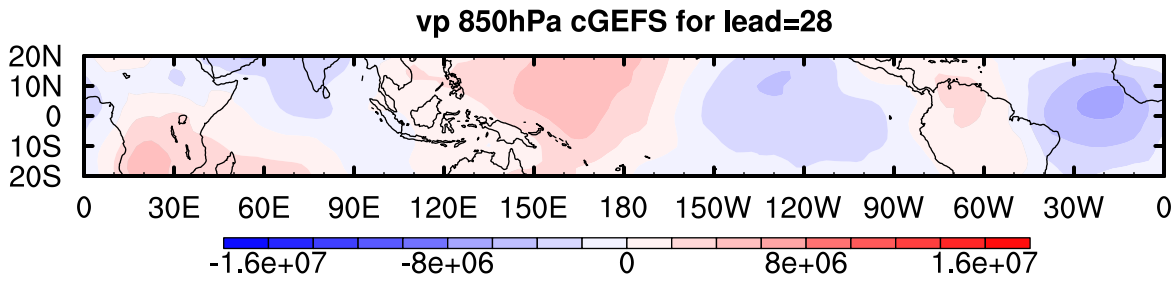
-4e+06
0
4e+06
8e+06


vp 850hPa anl for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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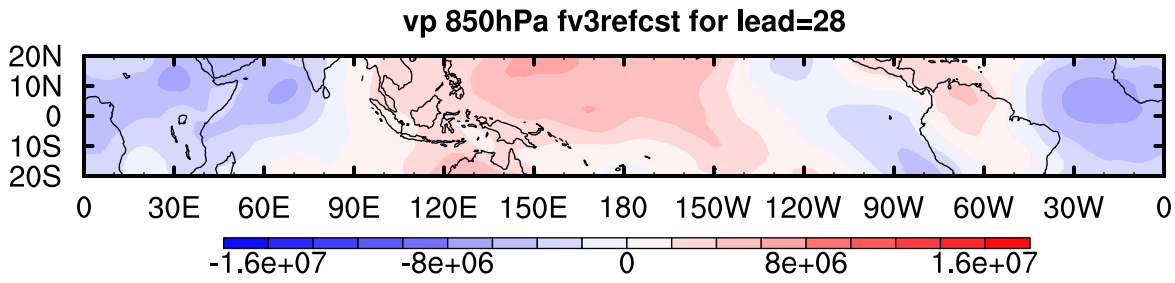
1.6e+07


vp 850hPa fv3refcst for lead=28
20N
10N
0
10S
20S
0
30E
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90E
120E
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60W
30W
0
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-8e+06
0
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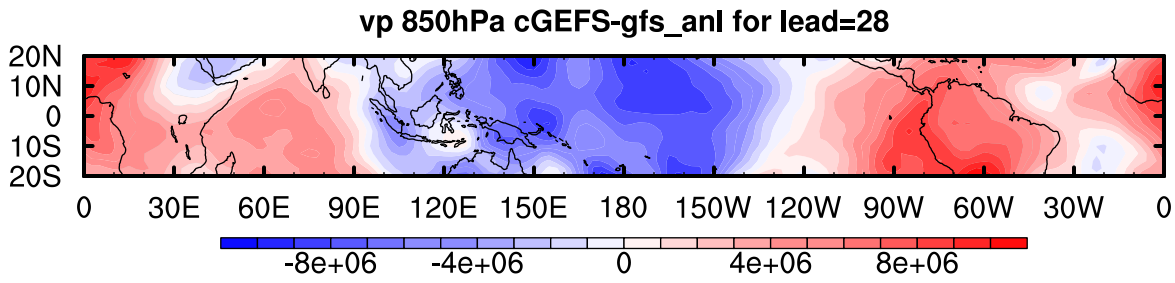
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=28
20N
10N
0
10S
20S
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30E
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90E
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120W
90W
60W
30W
0
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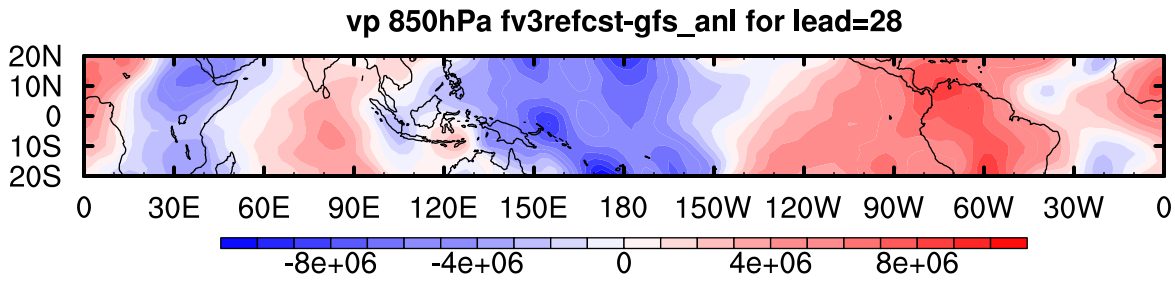
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=28
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10N
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10S
20S
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90E
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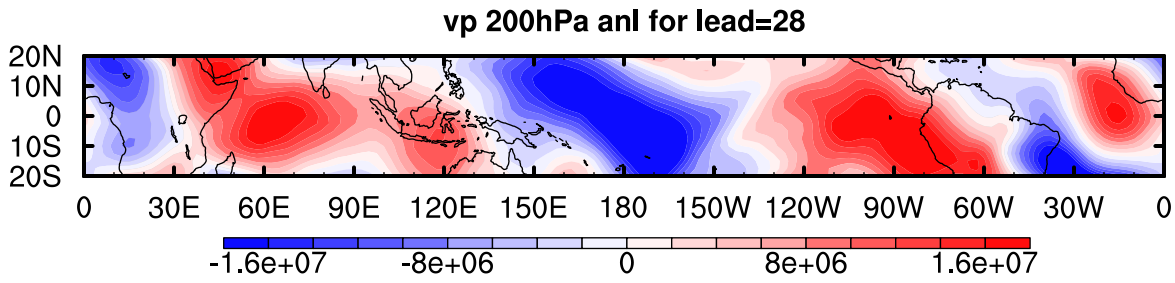
8e+06


vp 200hPa anl for lead=28
20N
10N
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10S
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120E
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60W
30W
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-8e+06
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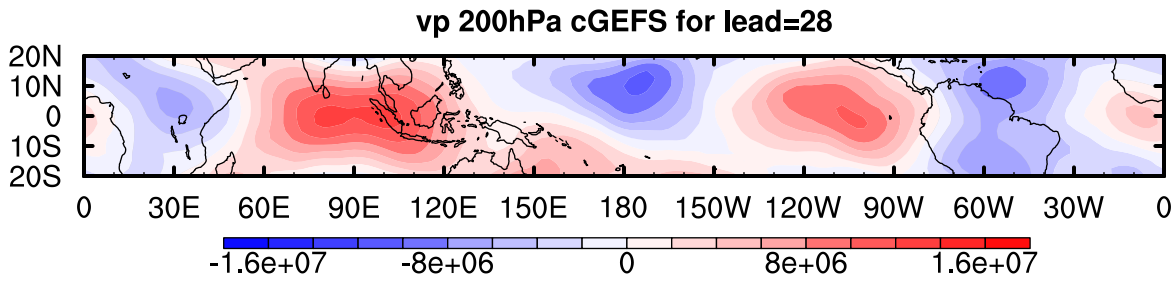
1.6e+07


vp 200hPa cGEFS for lead=28
20N
10N
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10S
20S
0
30E
60E
90E
120E
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90W
60W
30W
0
-1.6e+07
-8e+06
0
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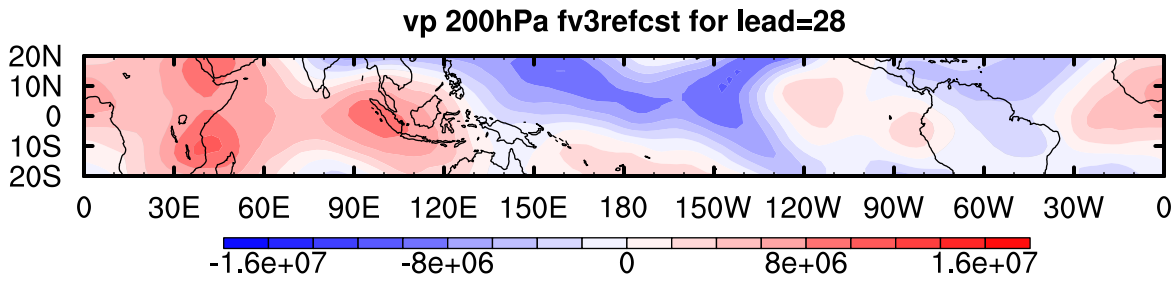
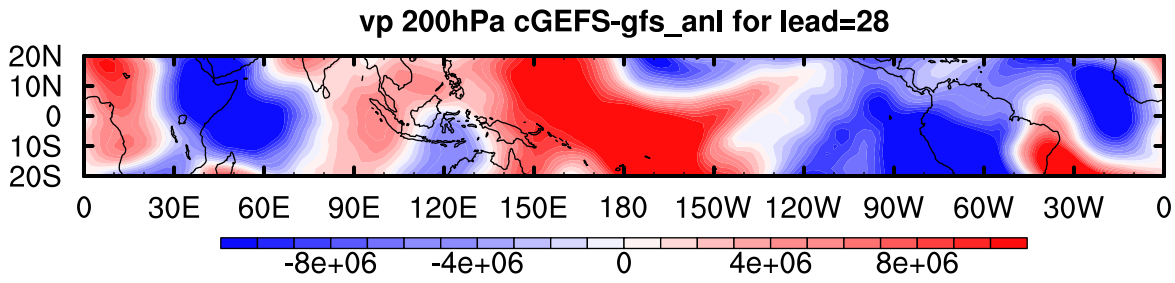
1.6e+07


vp 200hPa fv3refcst for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa cGEFS-gfs_anl for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
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180
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90W
60W
30W
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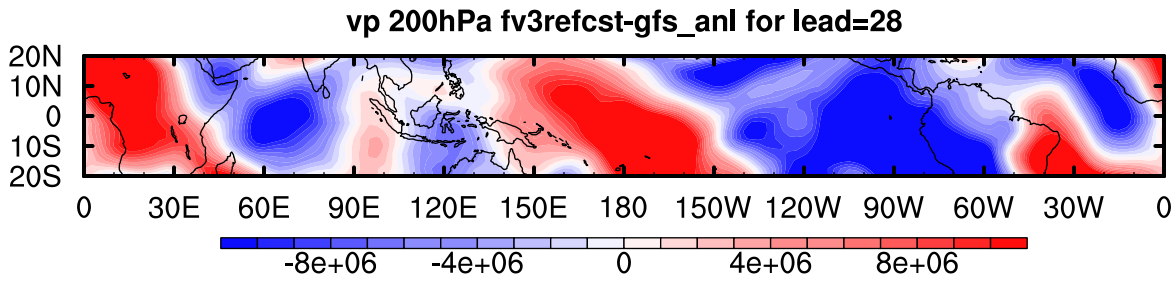
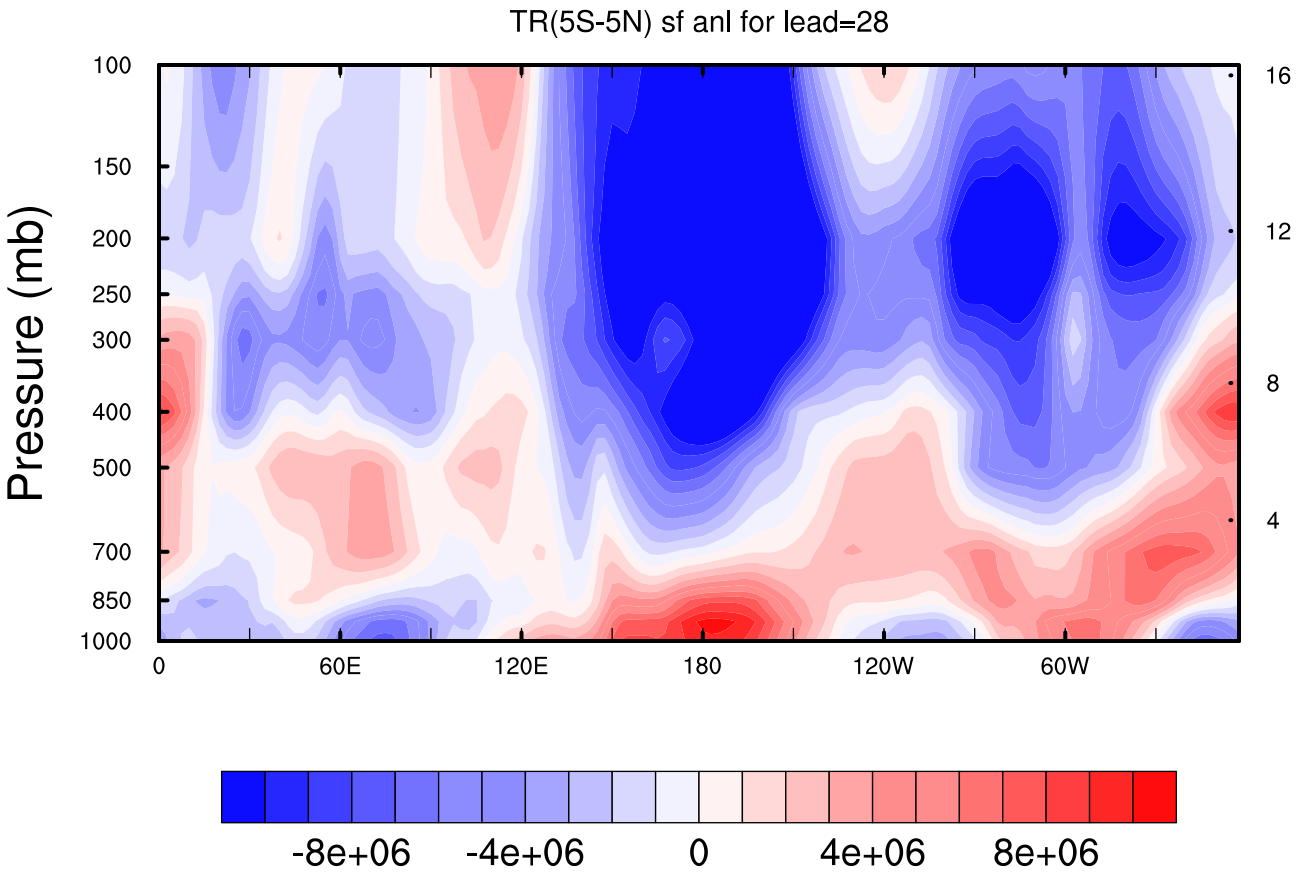
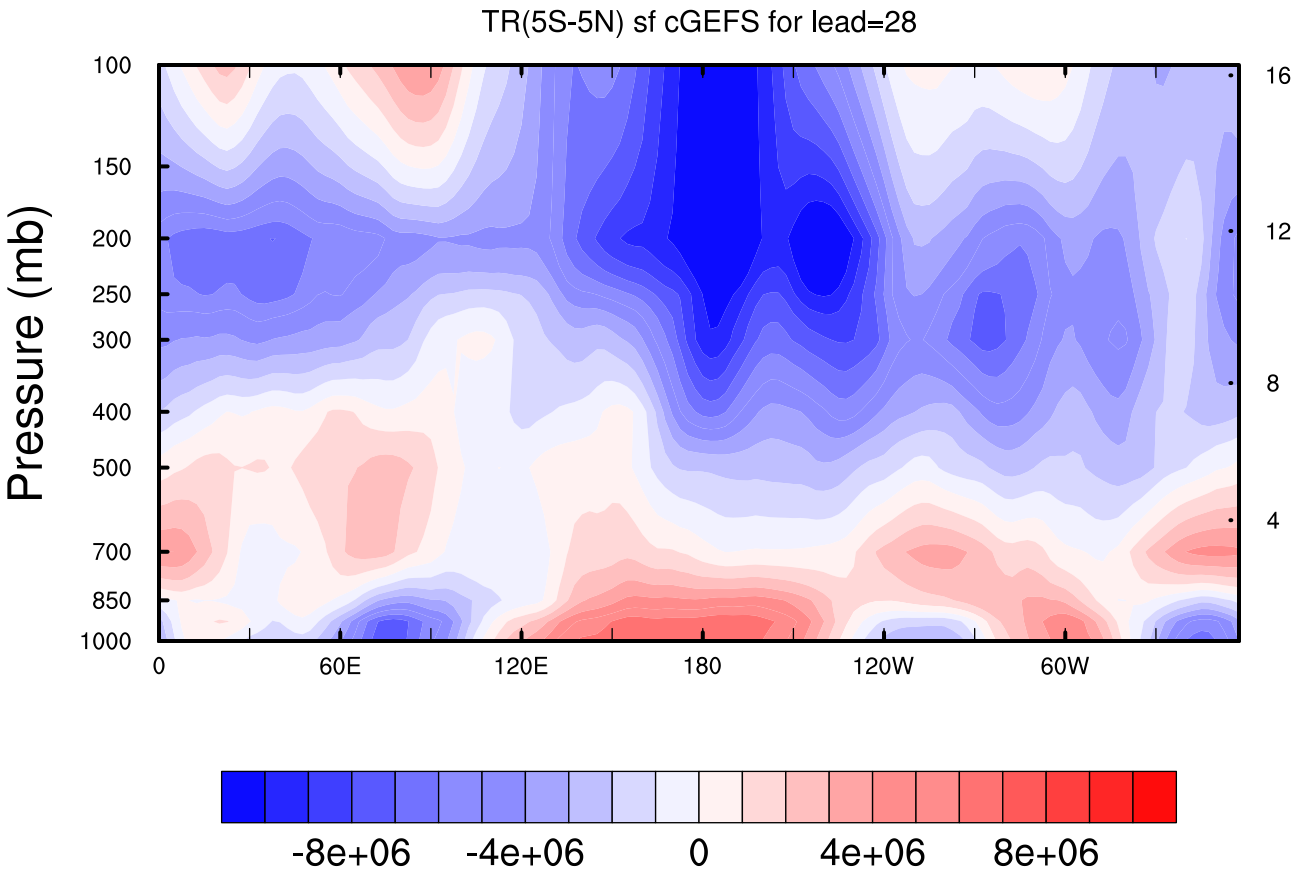
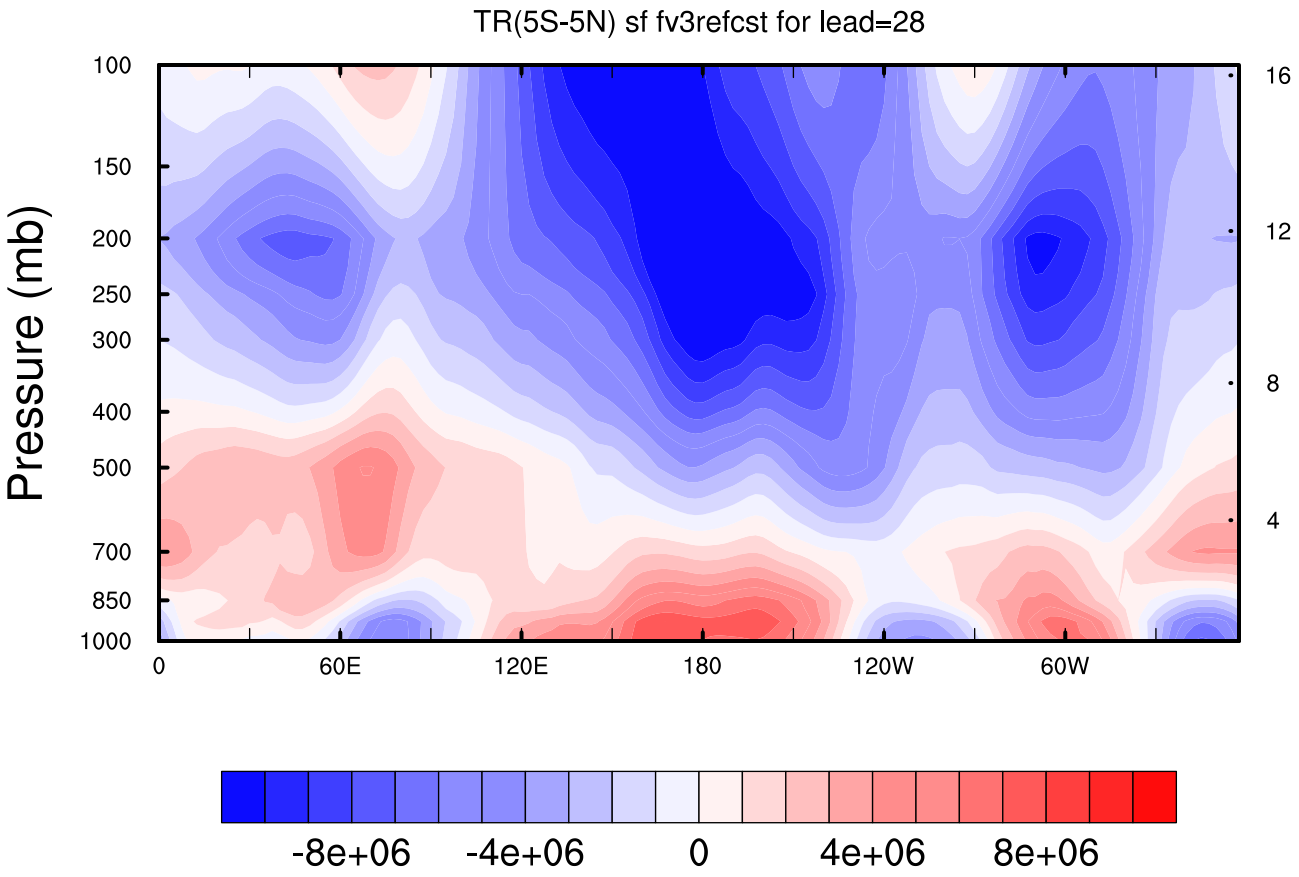
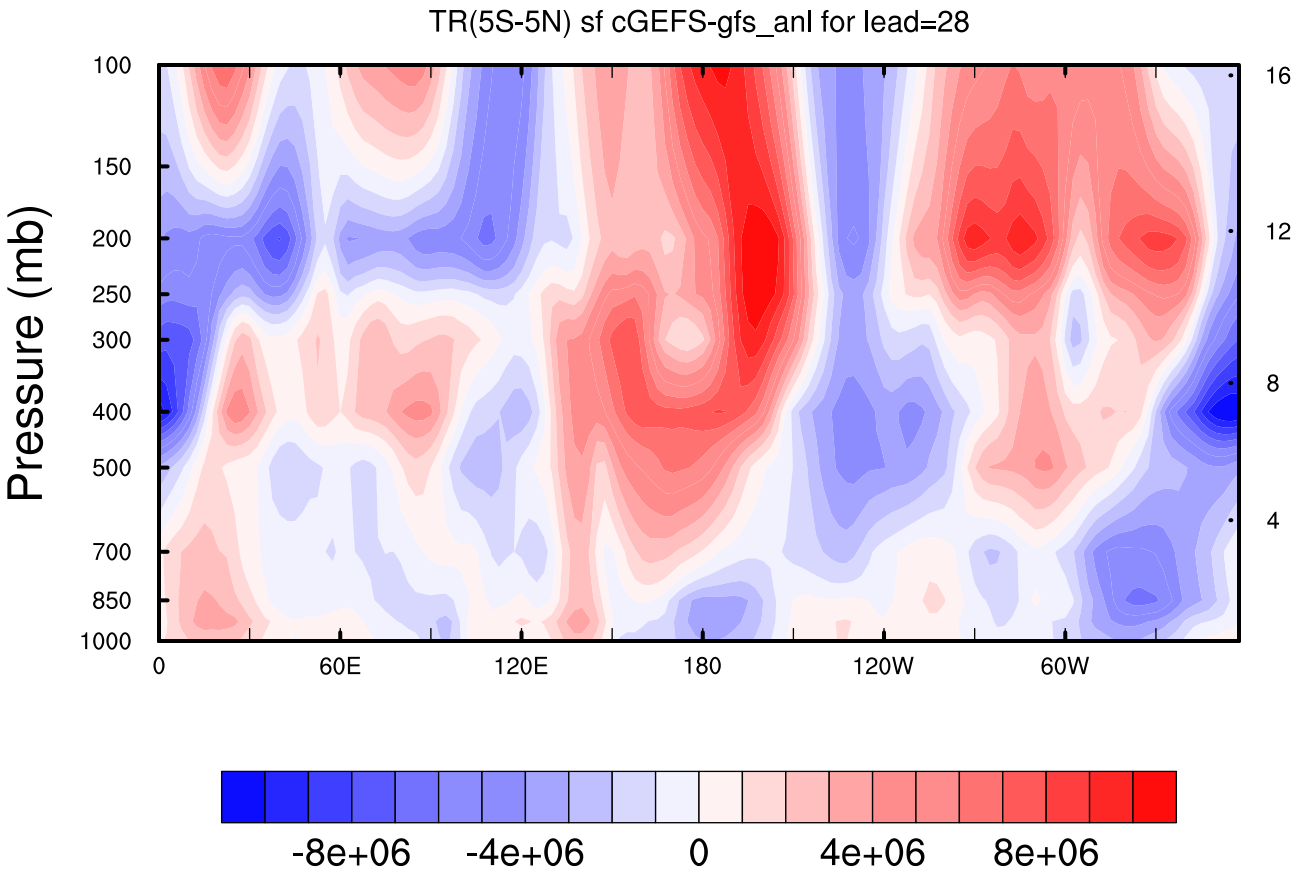
-4e+06
0
4e+06
8e+06

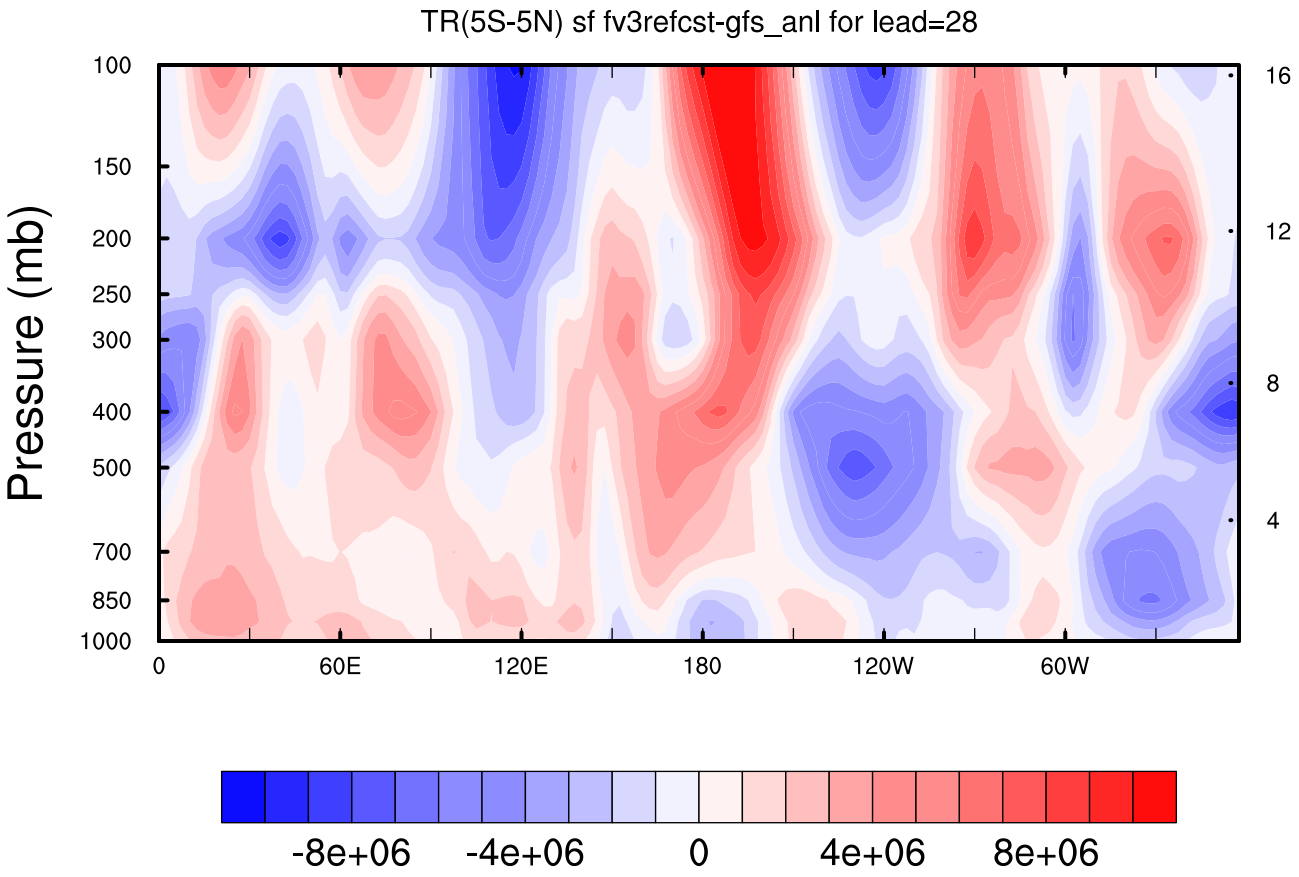

vp 200hPa fv3refcst-gfs_anl for lead=28
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

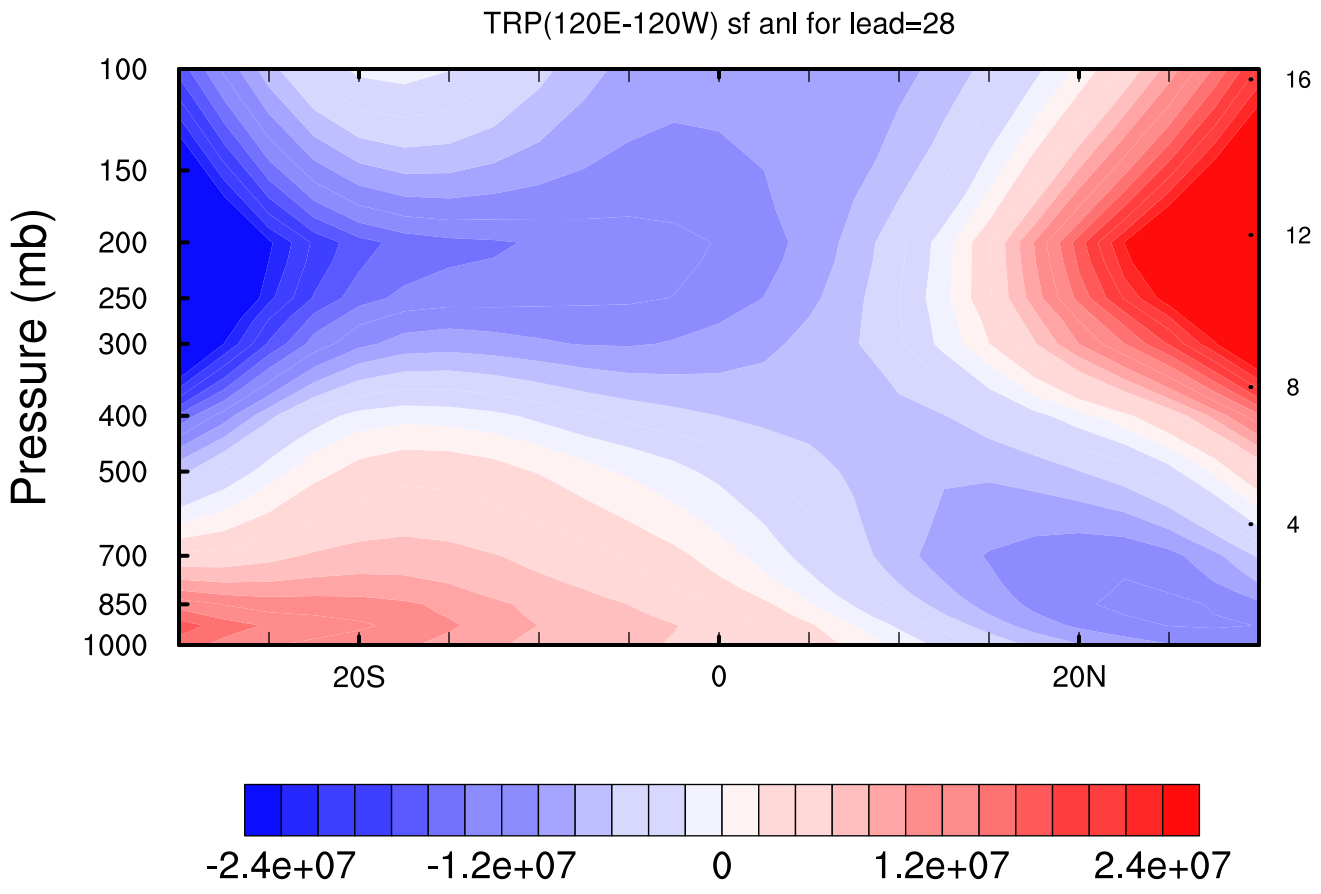

TR(5S-5N) sf anl for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

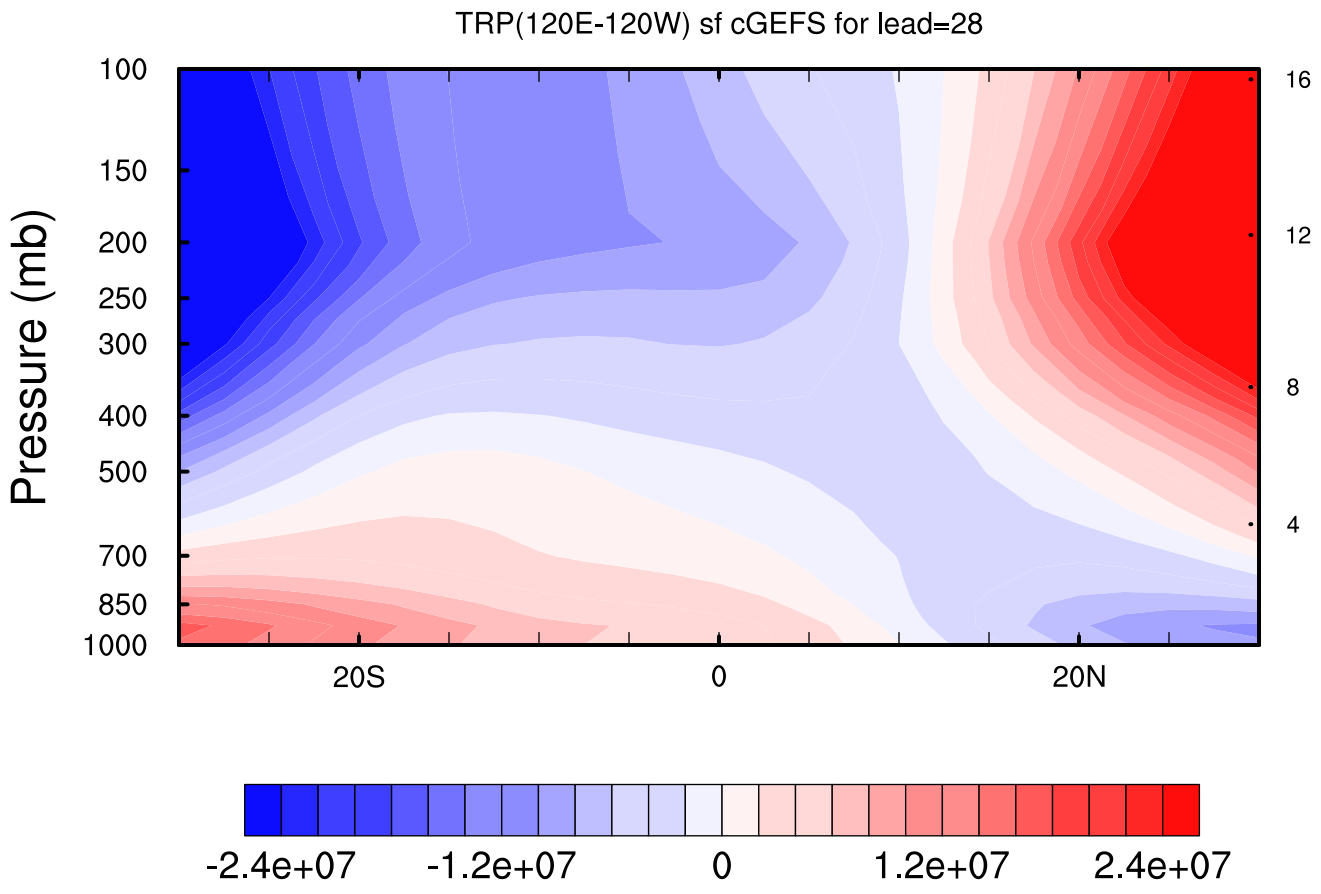

TR(5S-5N) sf cGEFS for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

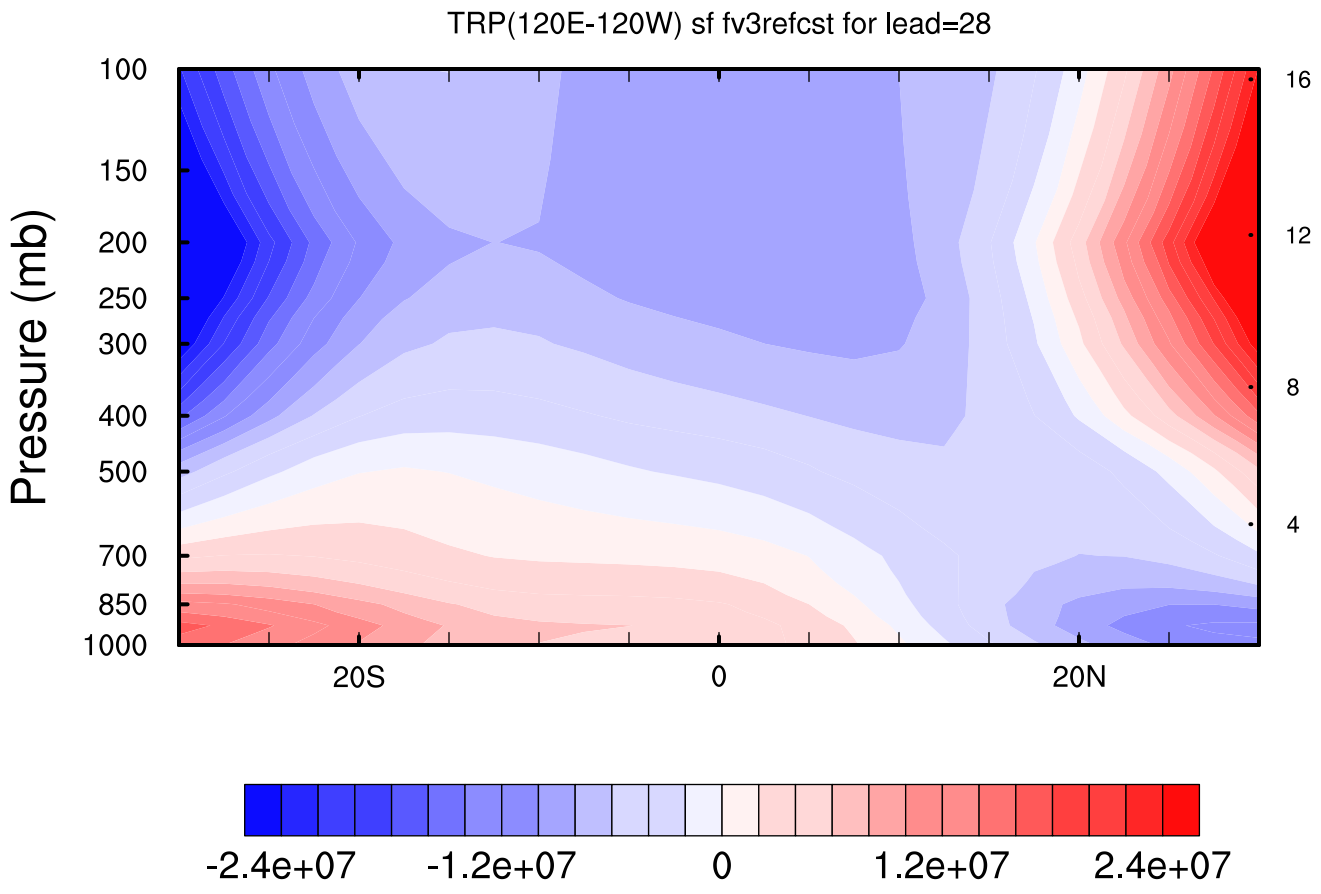

TR(5S-5N) sf fv3refcst for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

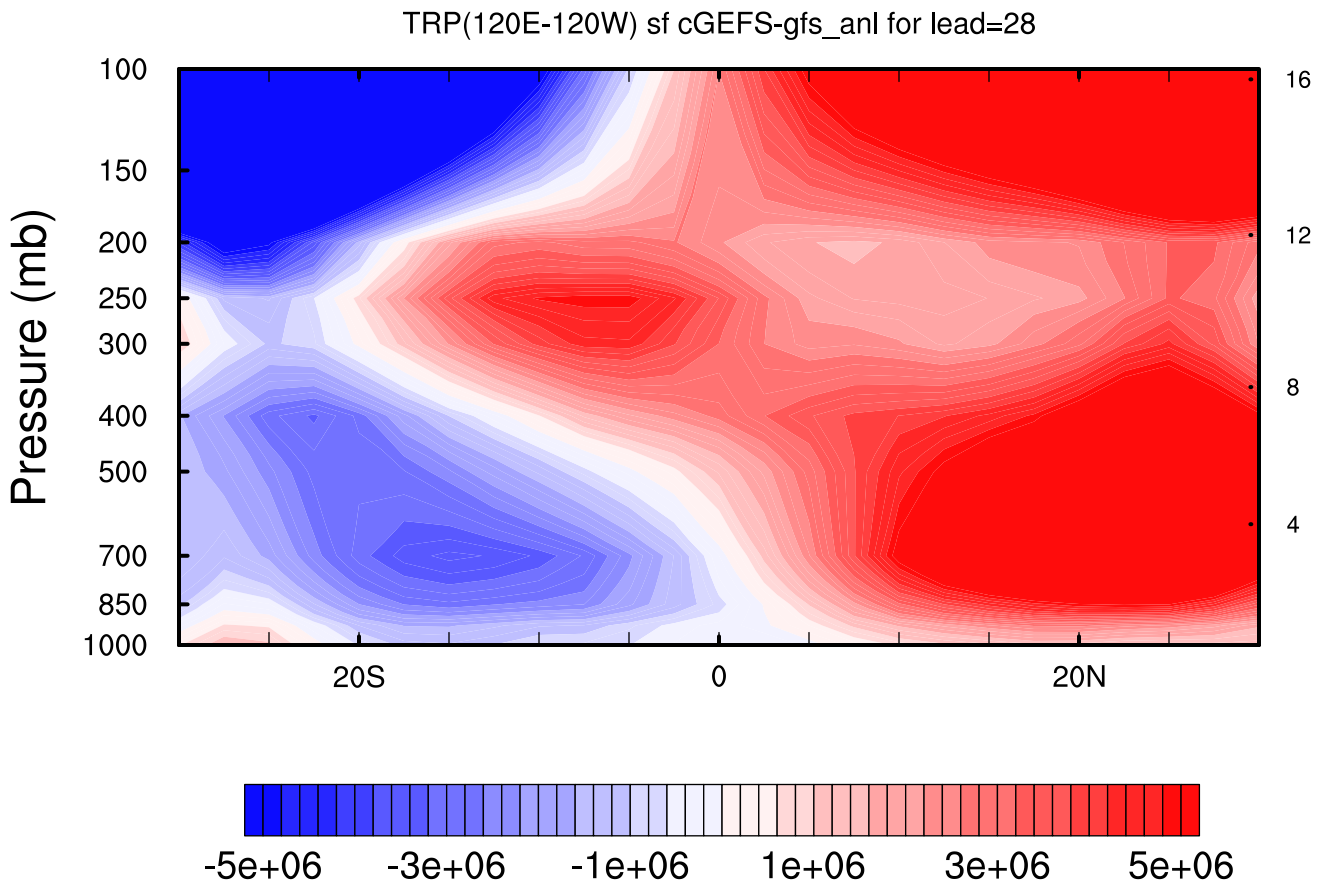

TR(5S-5N) sf cGEFS-gfs_anl for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

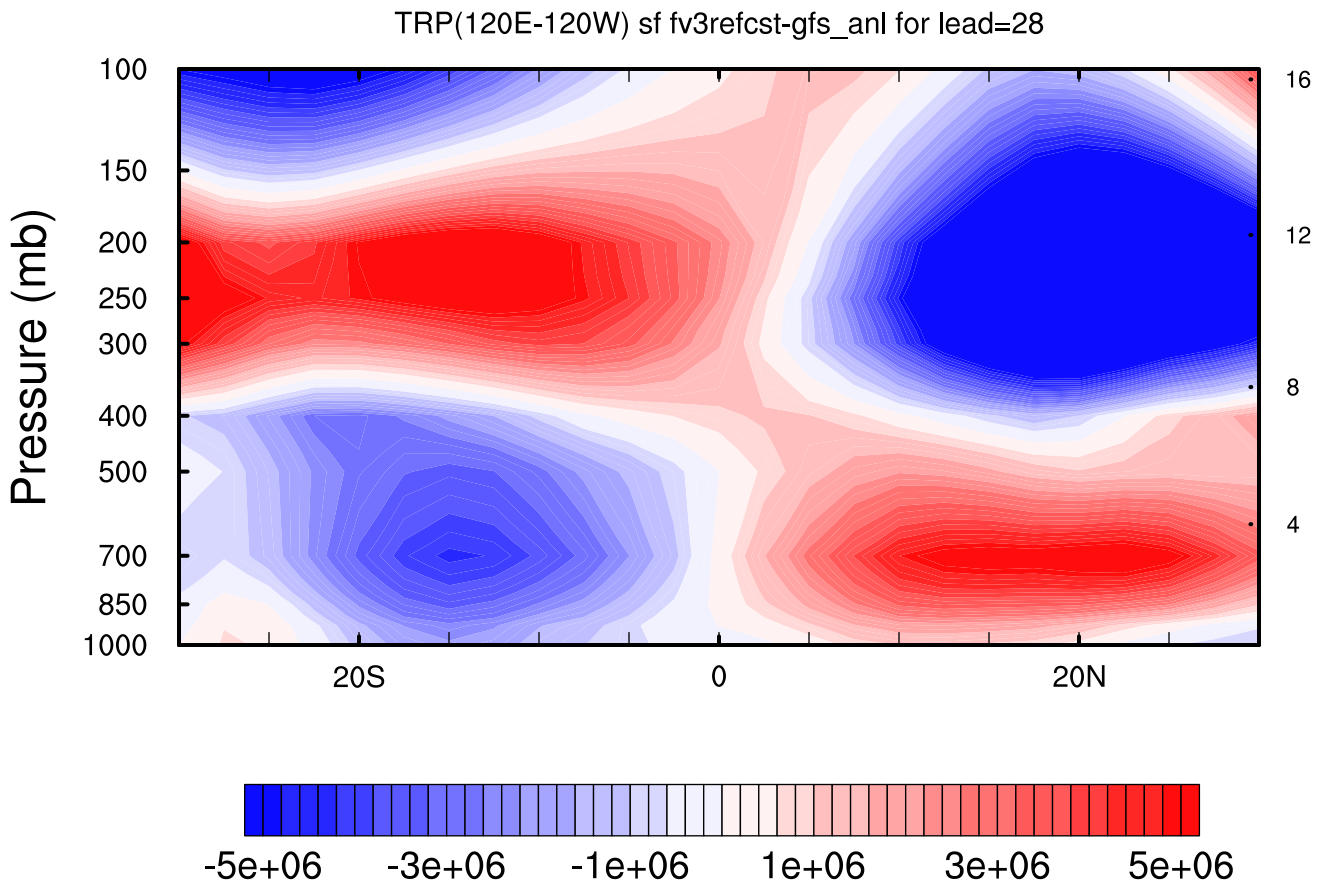

TR(5S-5N) sf fv3refcst-gfs_anl for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

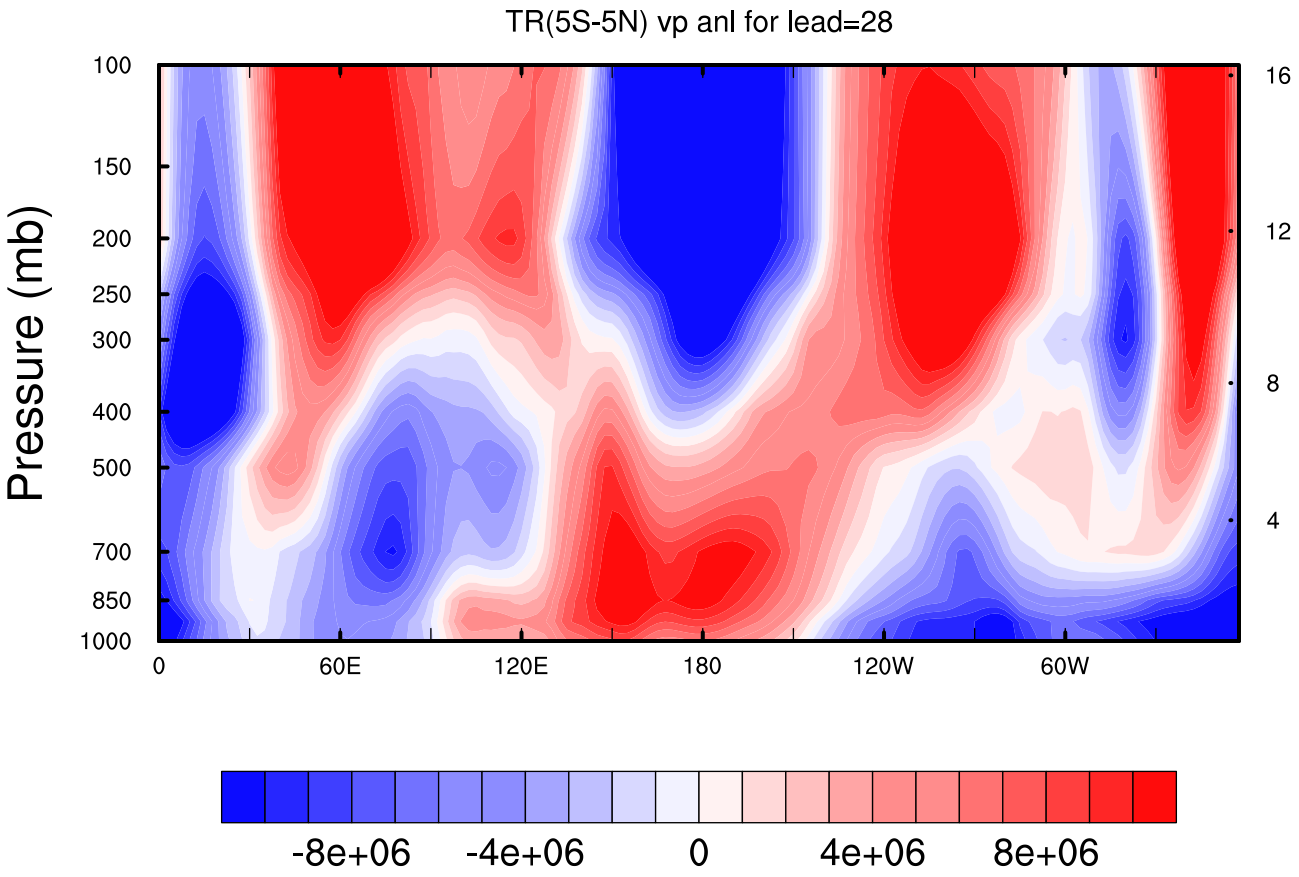

TRP(120E-120W) sf anl for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

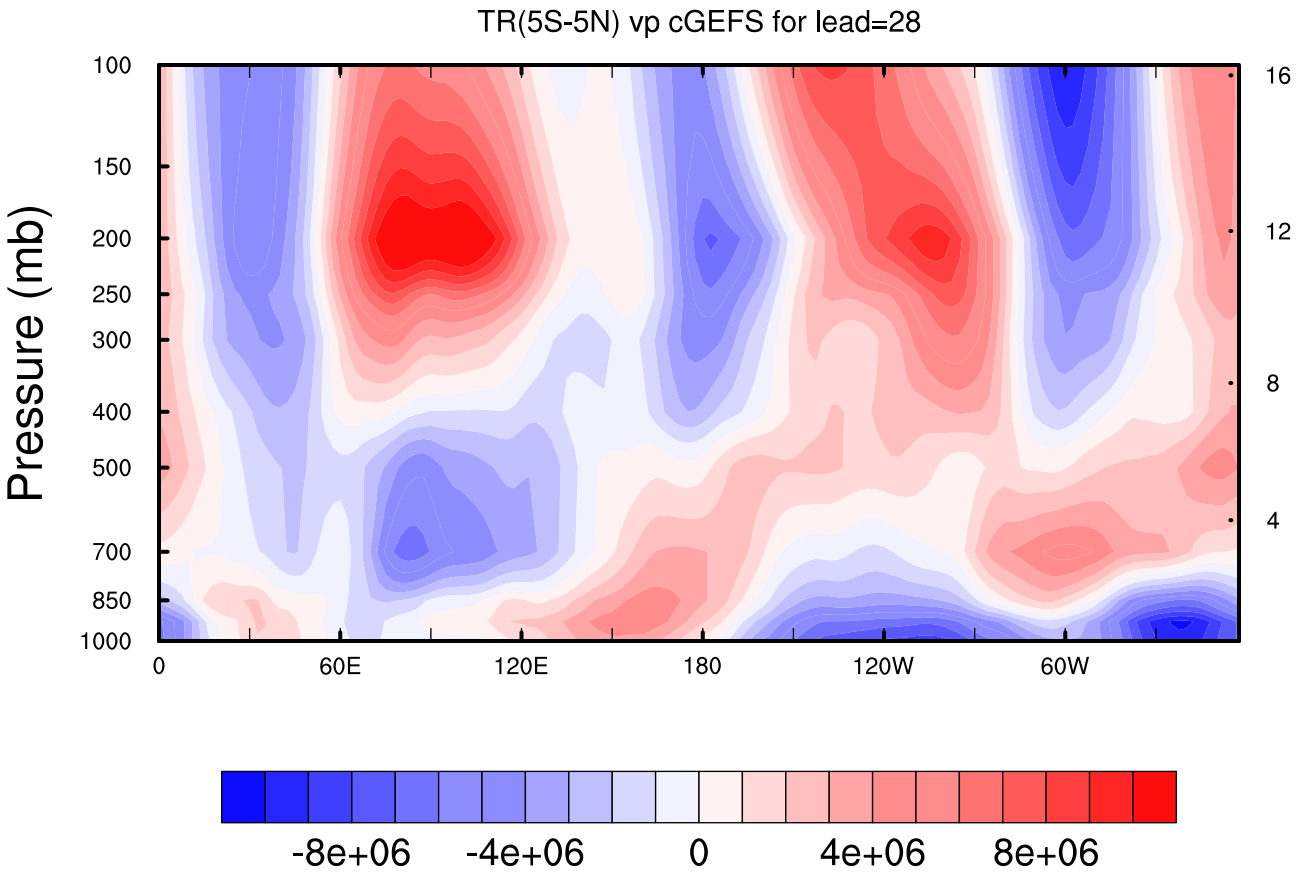

TRP(120E-120W) sf cGEFS for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

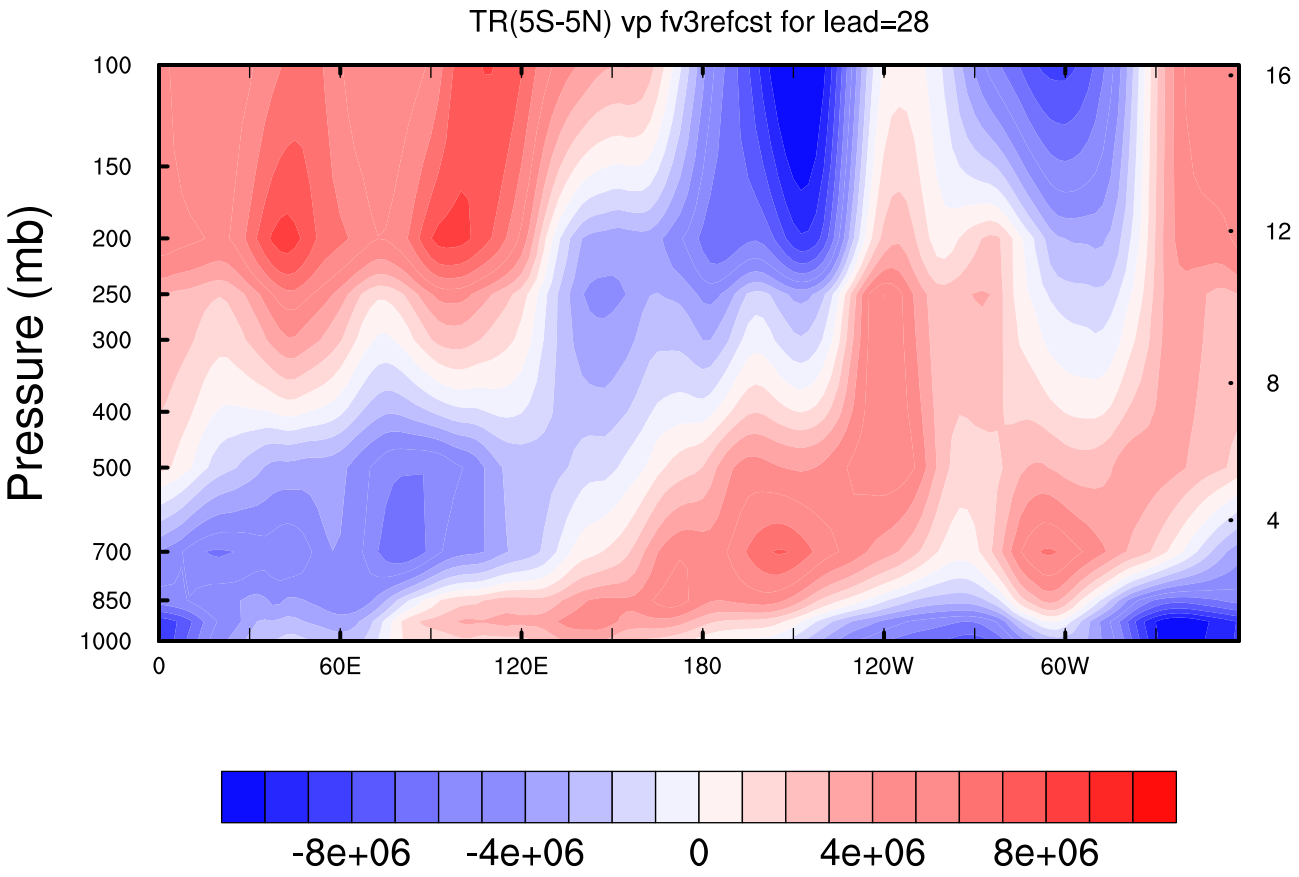

TRP(120E-120W) sf fv3refcst for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

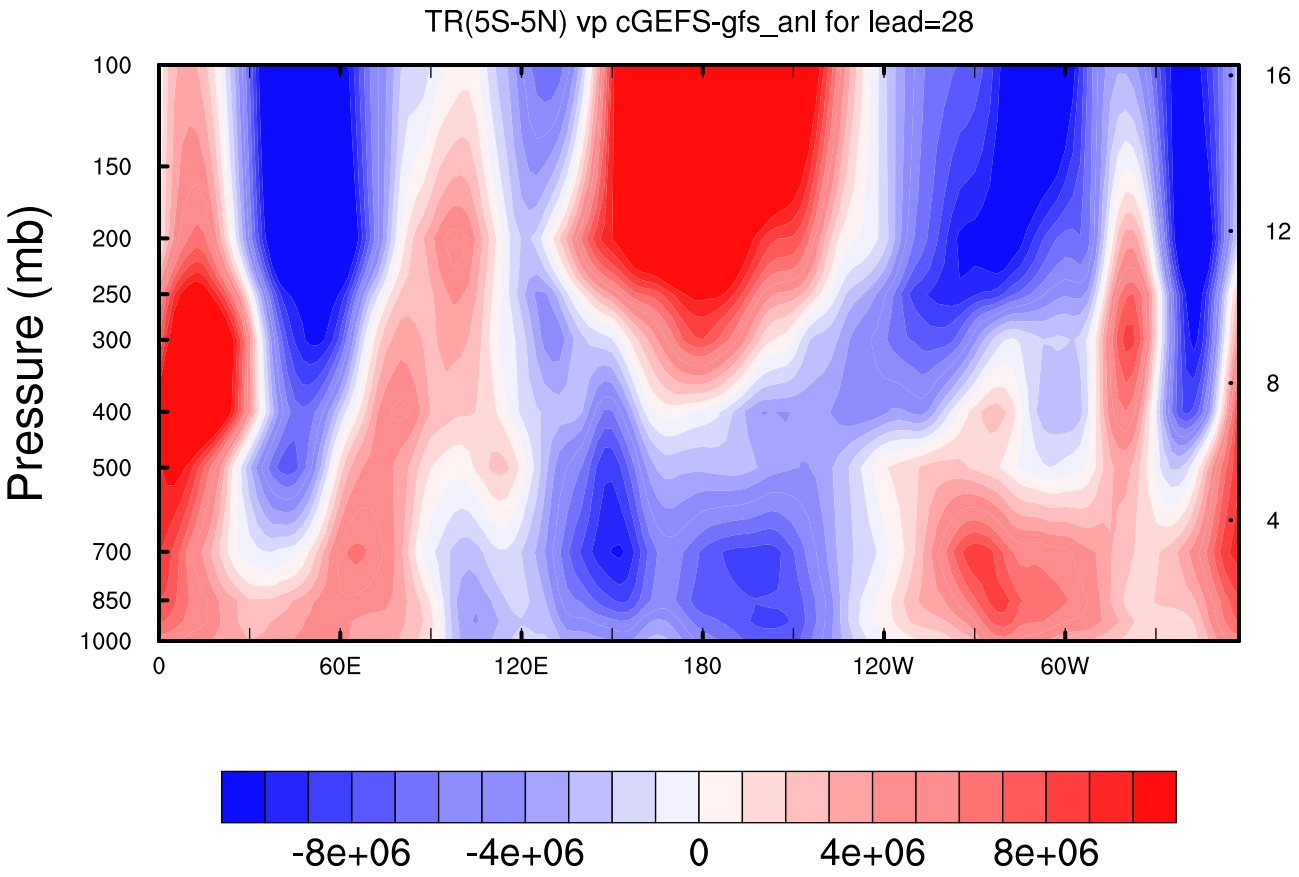

TRP(120E-120W) sf cGEFS-gfs_anl for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

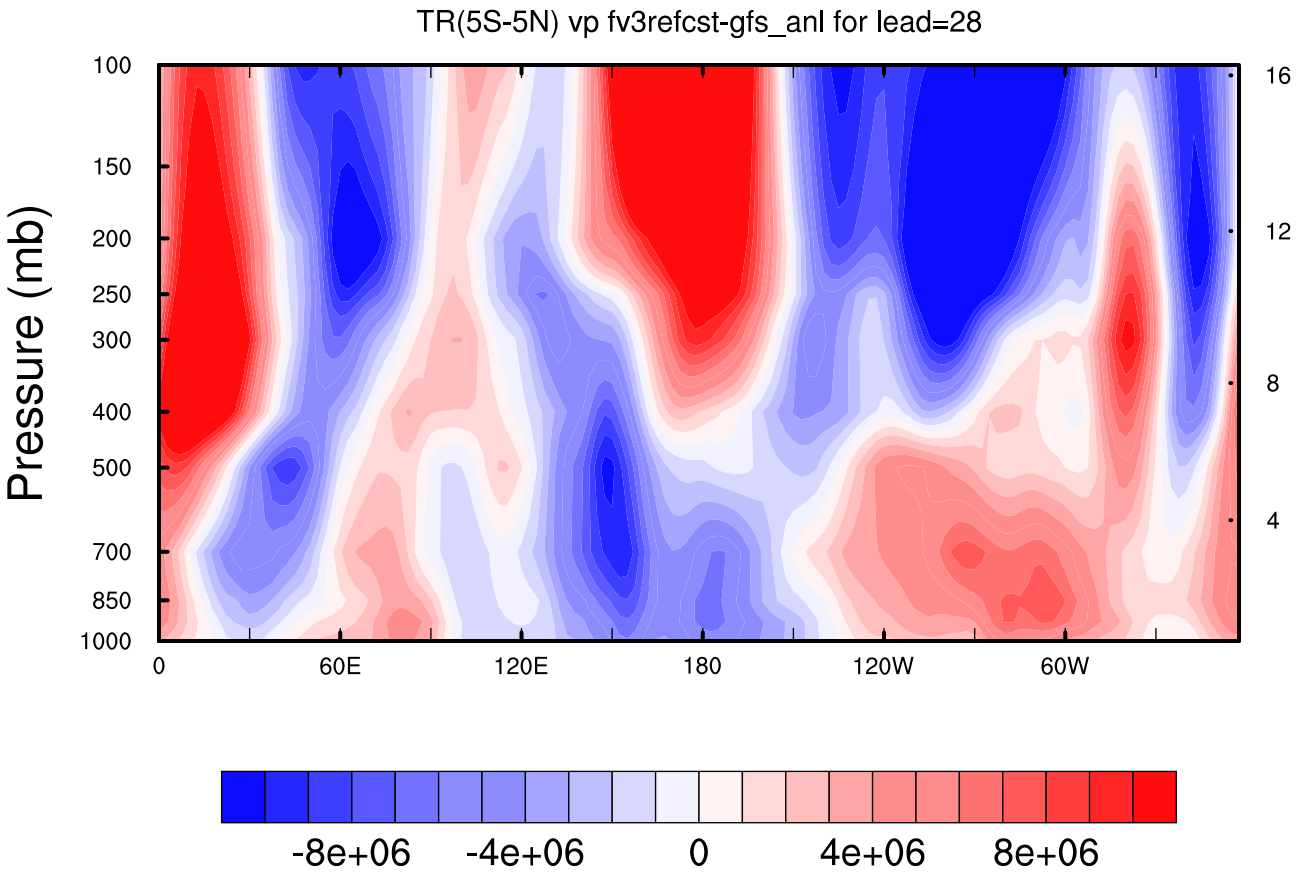

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

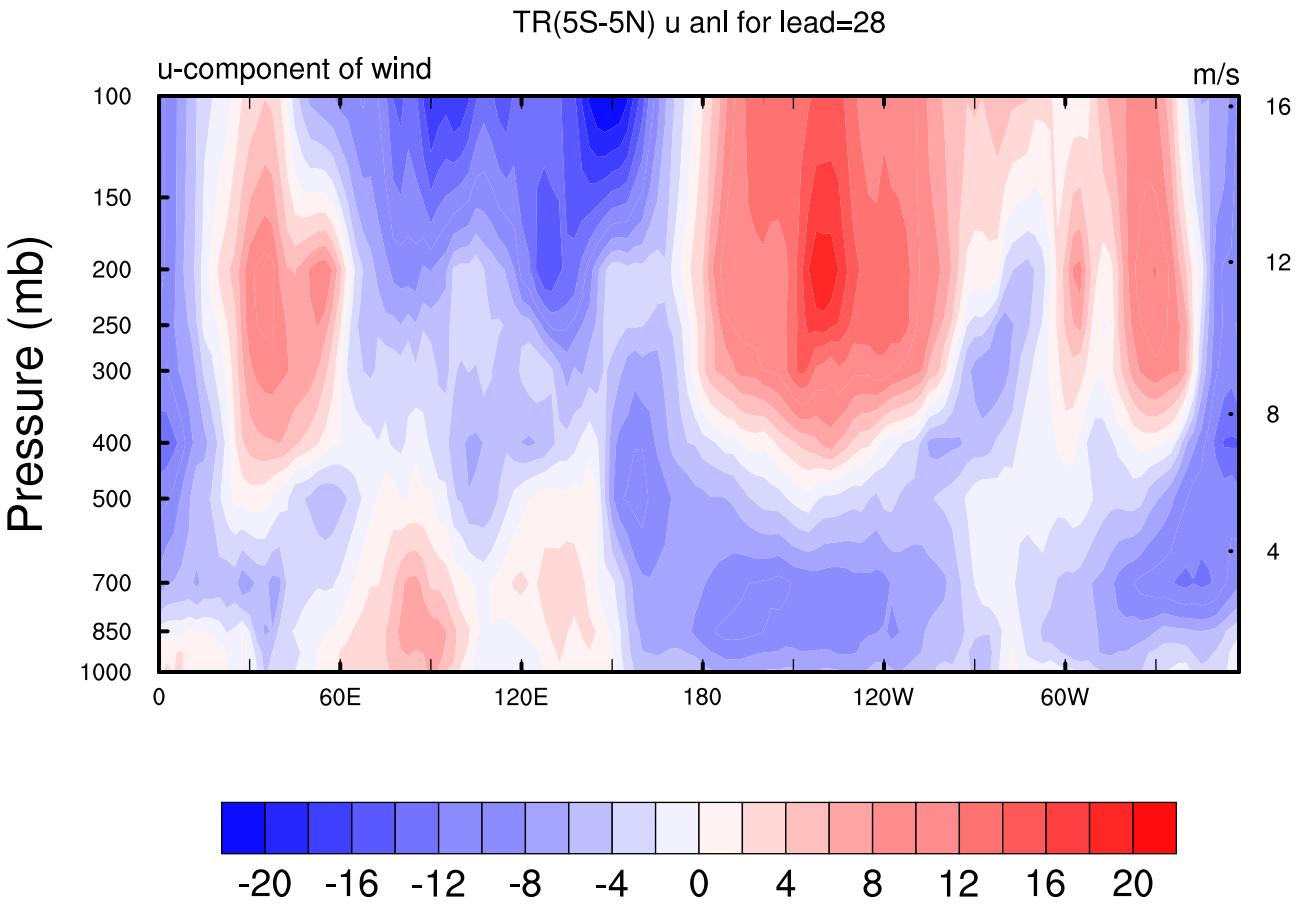

TR(5S-5N) vp anl for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

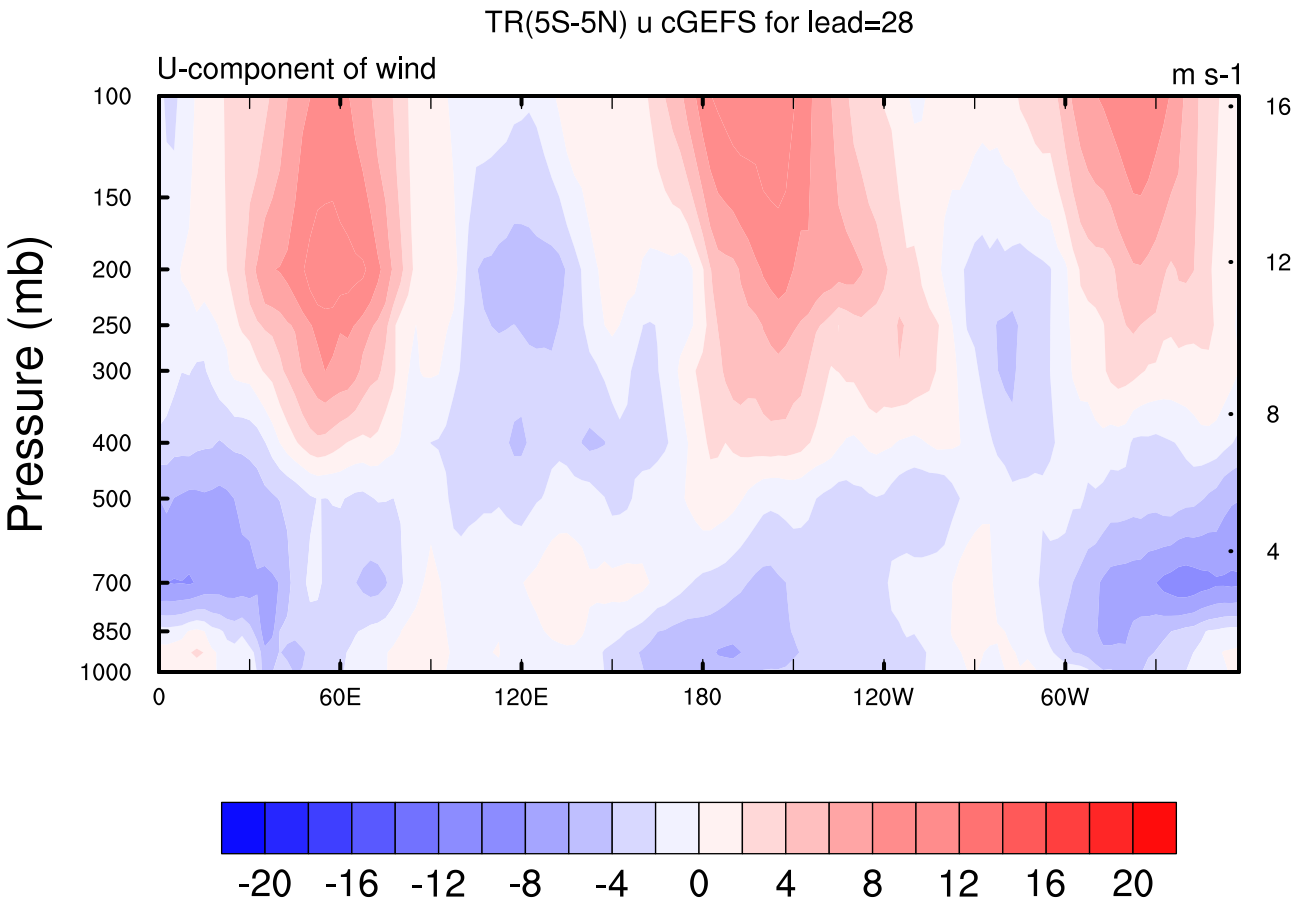

TR(5S-5N) vp cGEFS for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

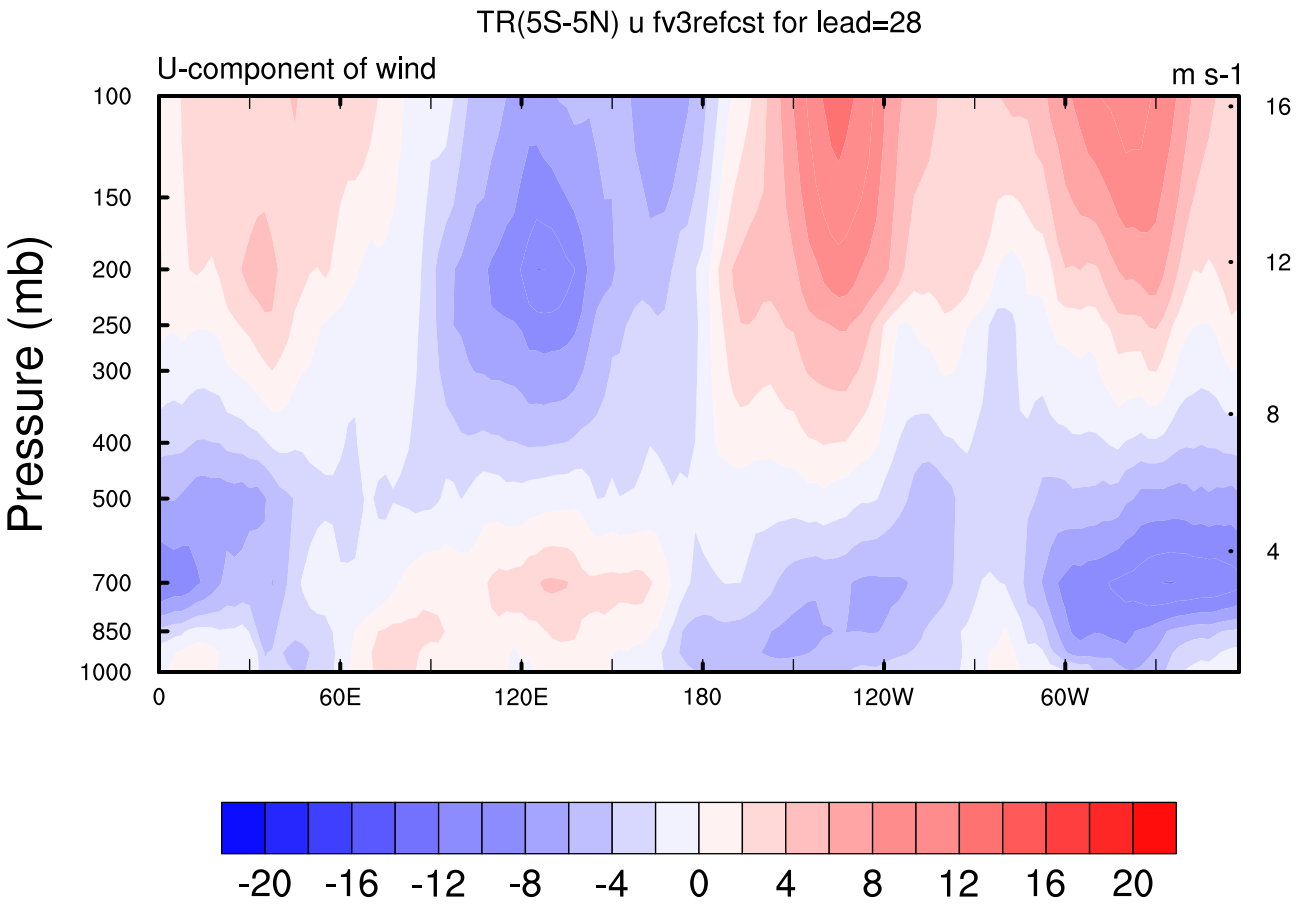

TR(5S-5N) vp fv3refcst for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

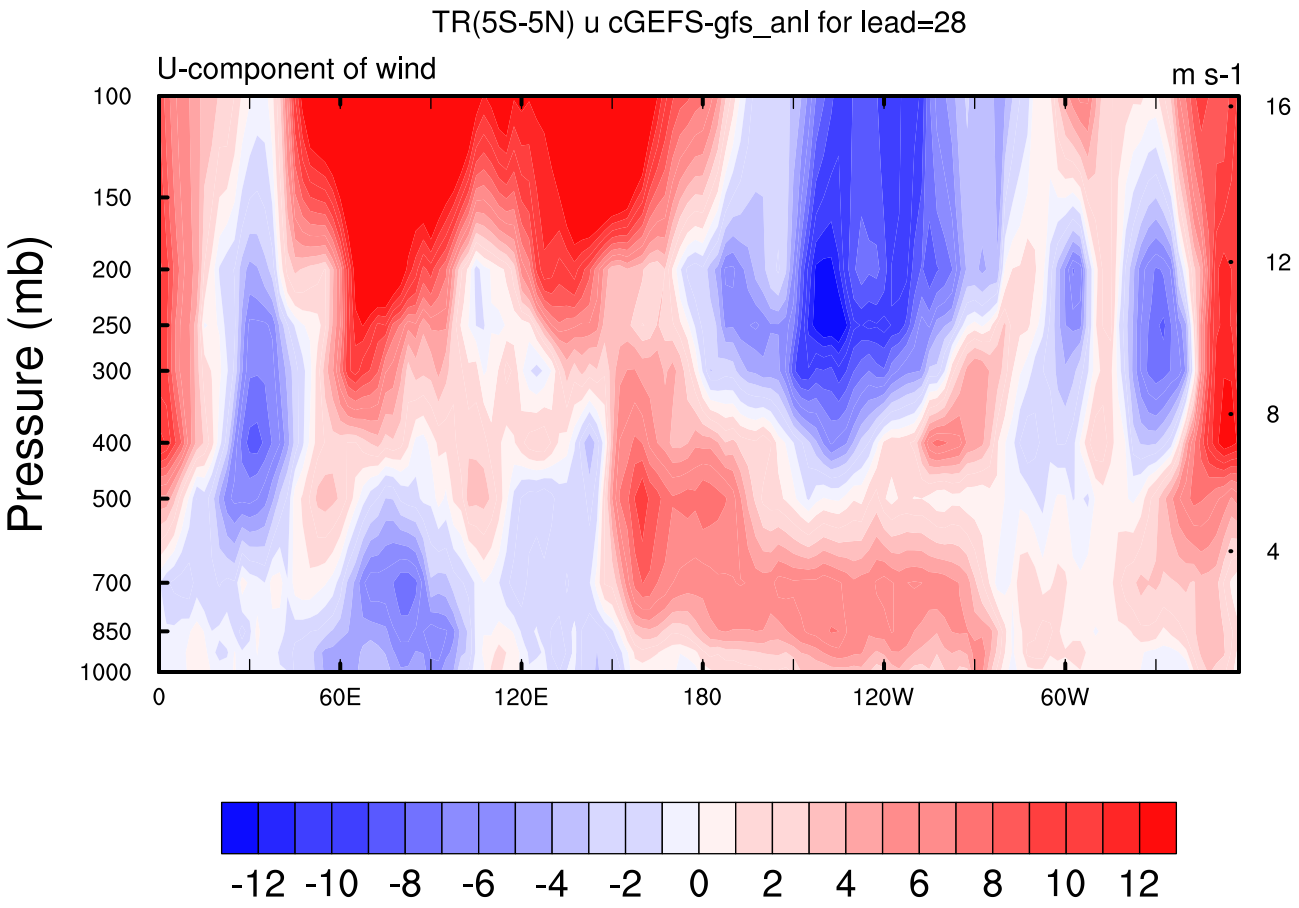

TR(5S-5N) vp cGEFS-gfs_anl for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

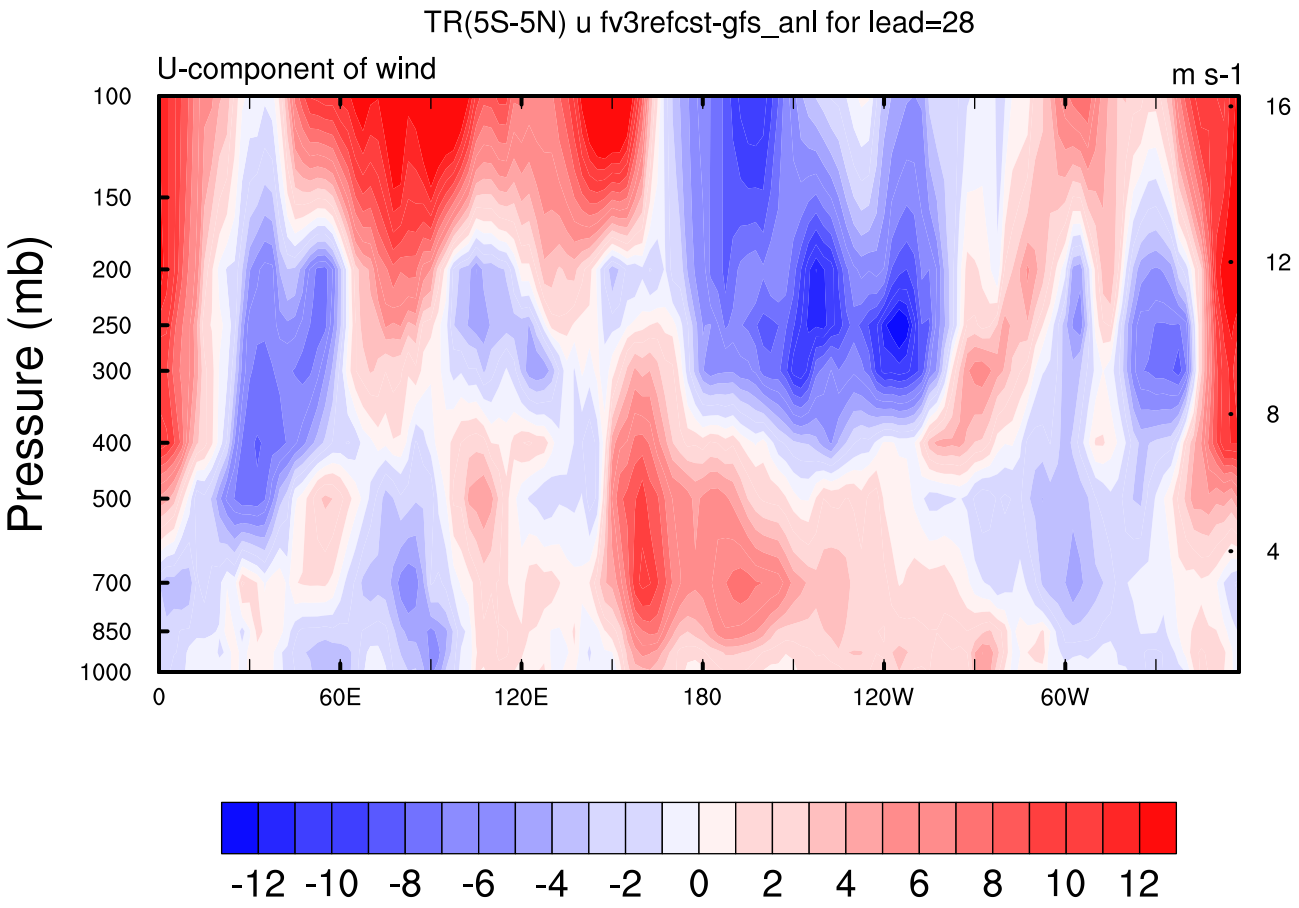

TR(5S-5N) vp fv3refcst-gfs_anl for lead=28
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

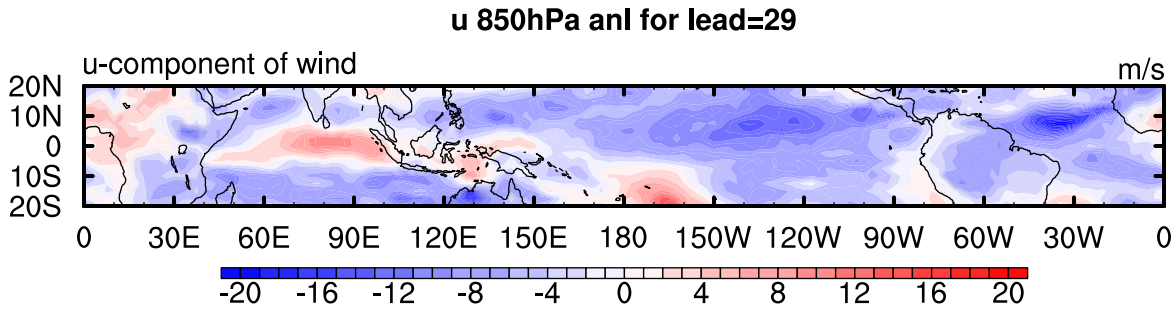

TR(5S-5N) u anl for lead=28
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

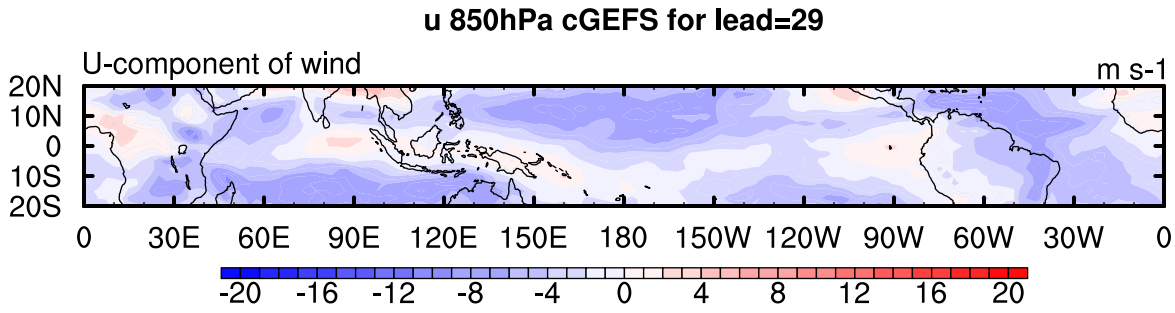

TR(5S-5N) u cGEFS for lead=28
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

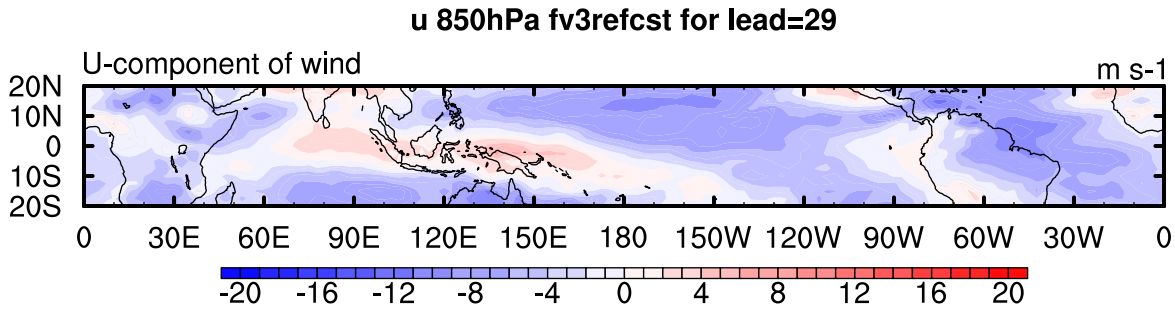

TR(5S-5N) u fv3refcst for lead=28
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

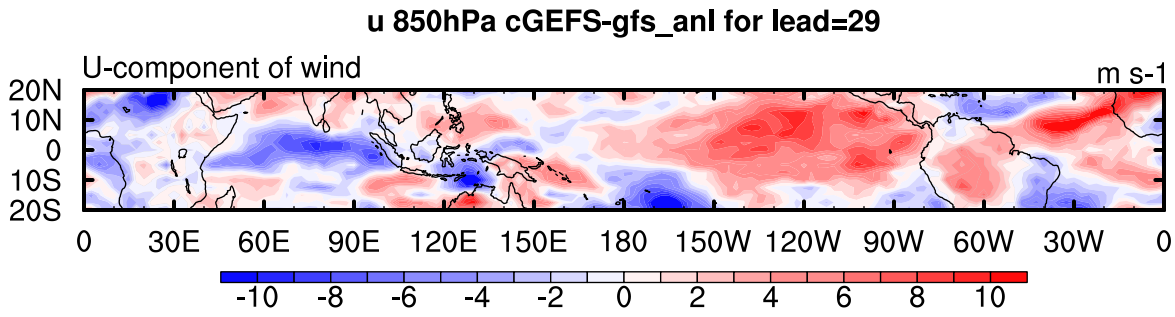

TR(5S-5N) u cGEFS-gfs_anl for lead=28
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

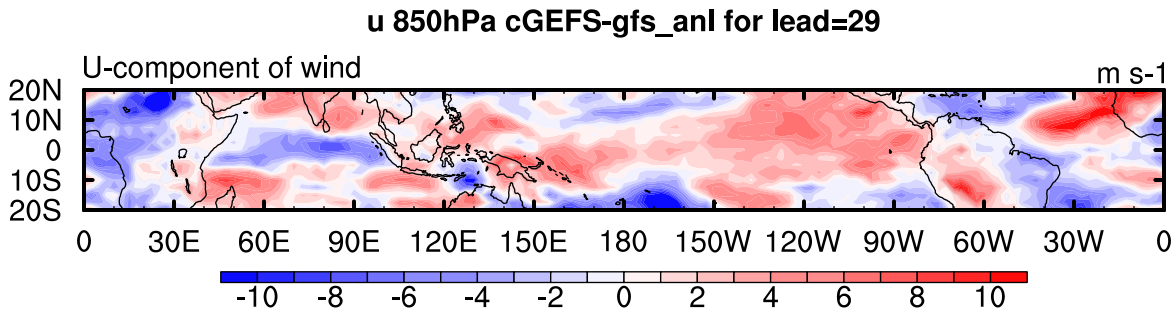

TR(5S-5N) u fv3refcst-gfs_anl for lead=28
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

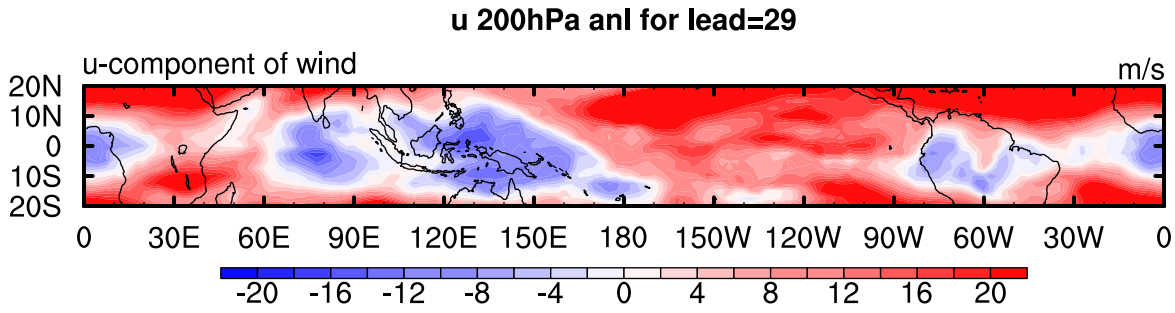

u 850hPa anl for lead=29
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

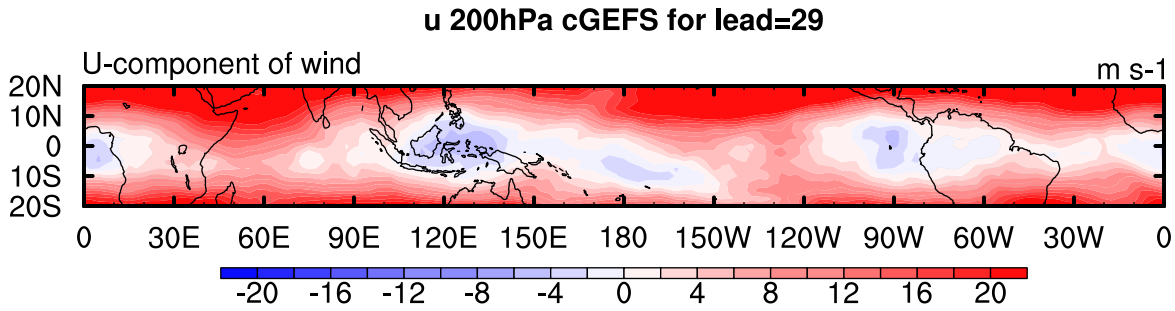

u 850hPa cGEFS for lead=29
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

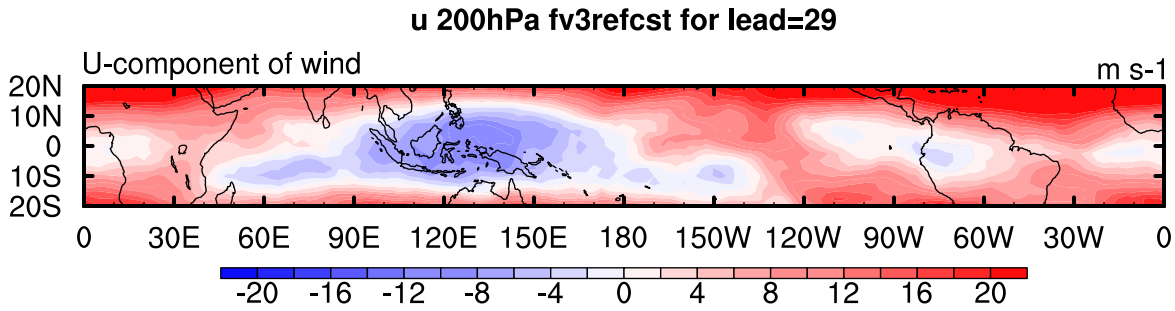

u 850hPa fv3refcst for lead=29
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=29
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 850hPa cGEFS-gfs_anl for lead=29
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=29
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=29
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa fv3refcst for lead=29
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-20
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-4
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8
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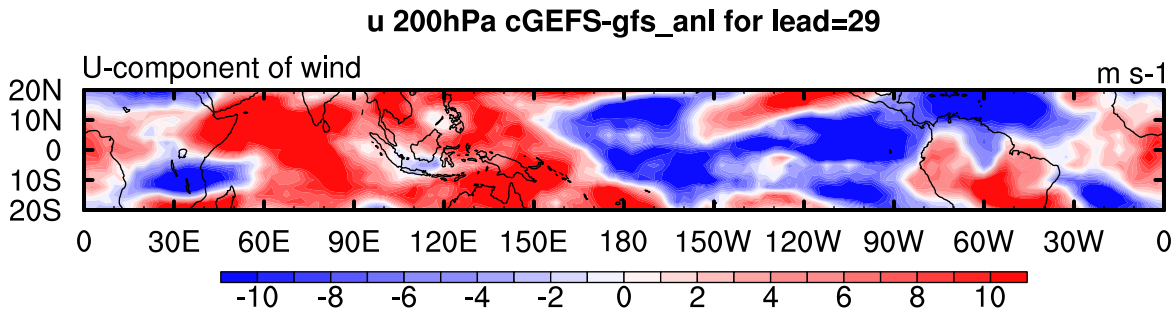
u 200hPa cGEFS-gfs_anl for lead=29
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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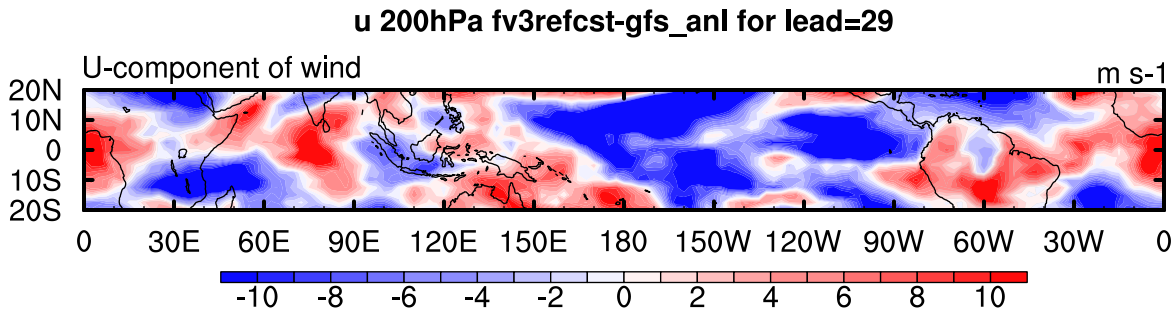
10


u 200hPa fv3refcst-gfs_anl for lead=29
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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30W
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-10
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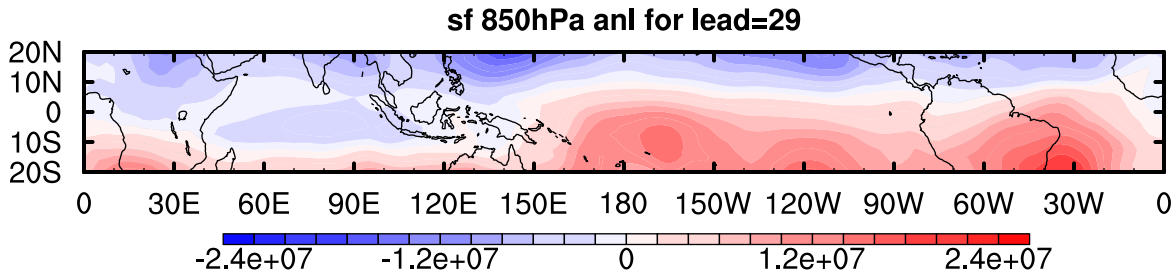
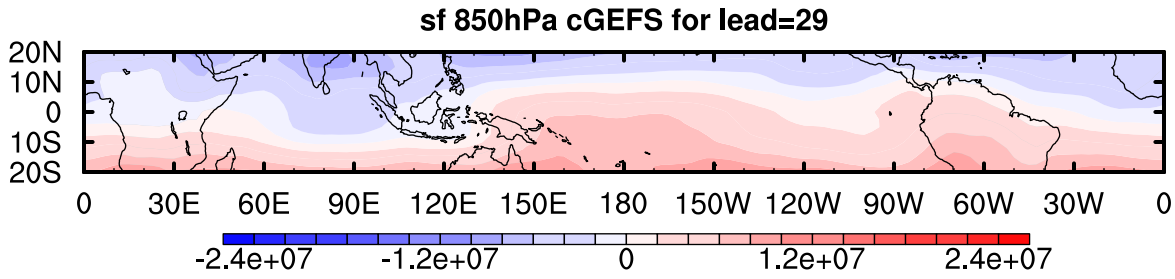

sf 850hPa anl for lead=29
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=29
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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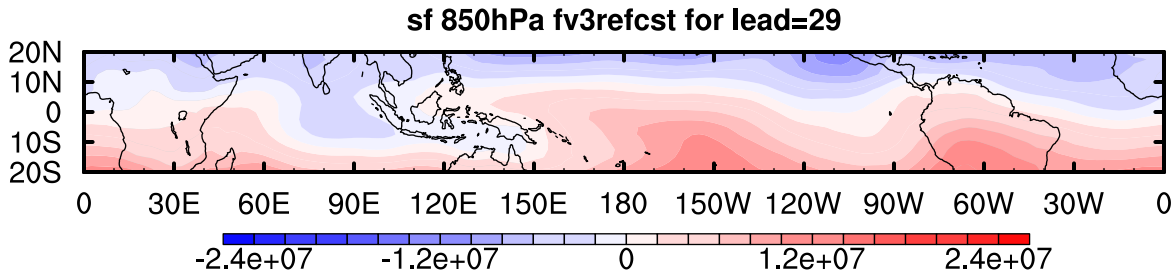
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90E
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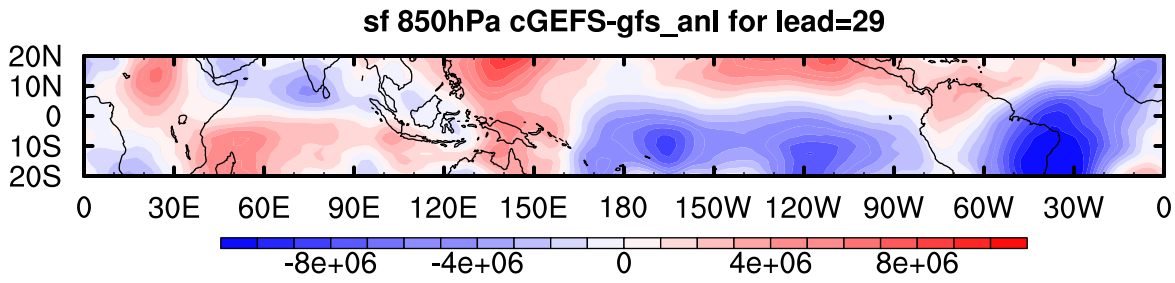
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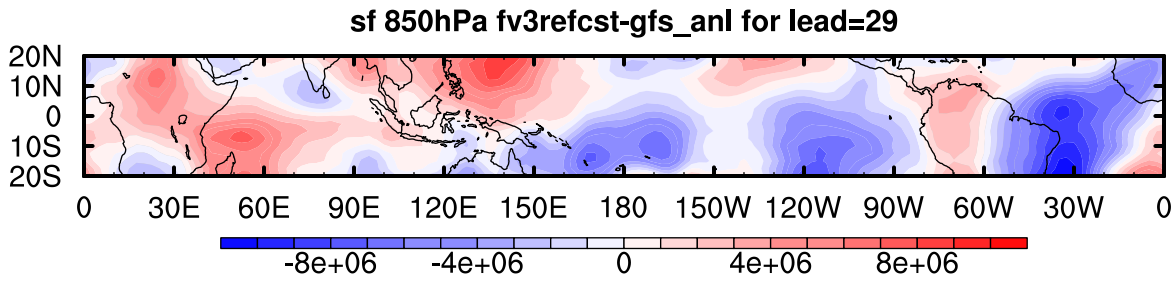
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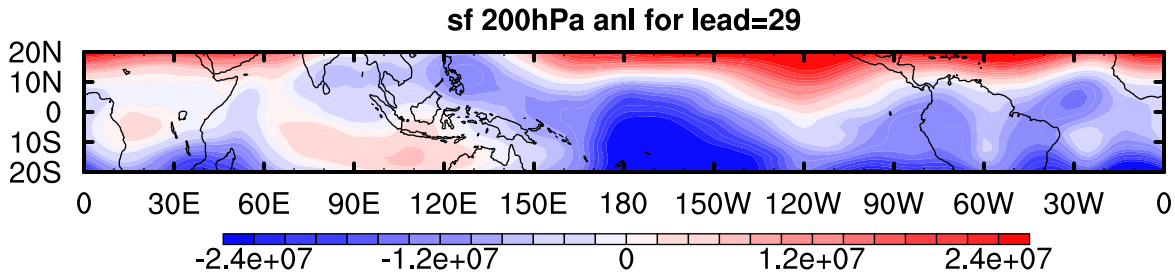
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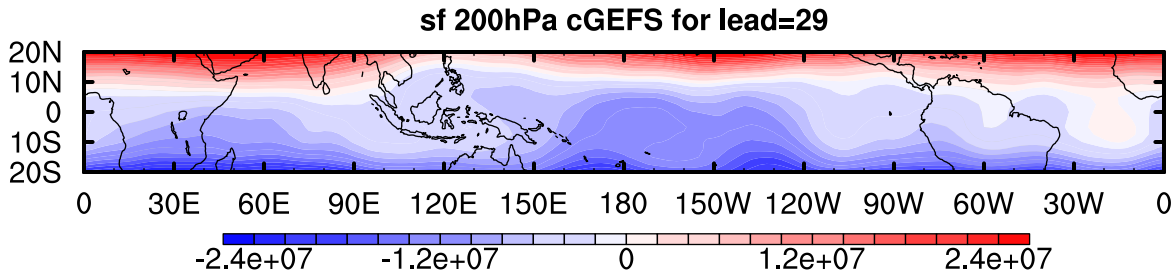
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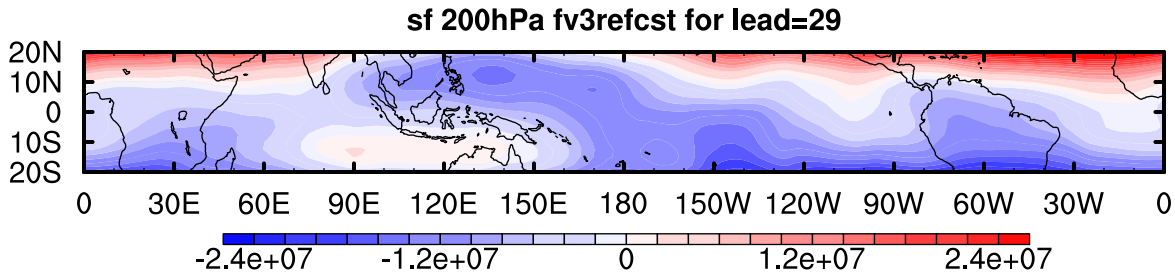
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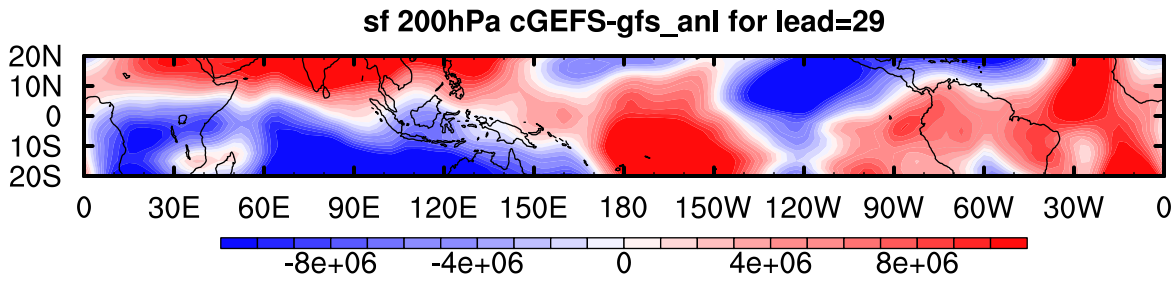
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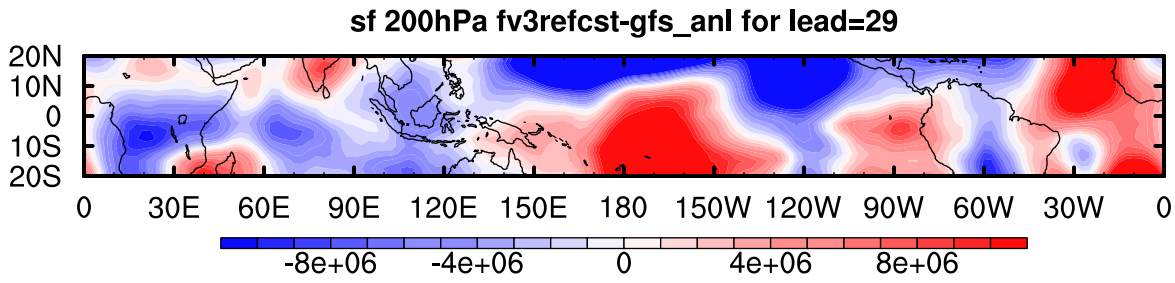
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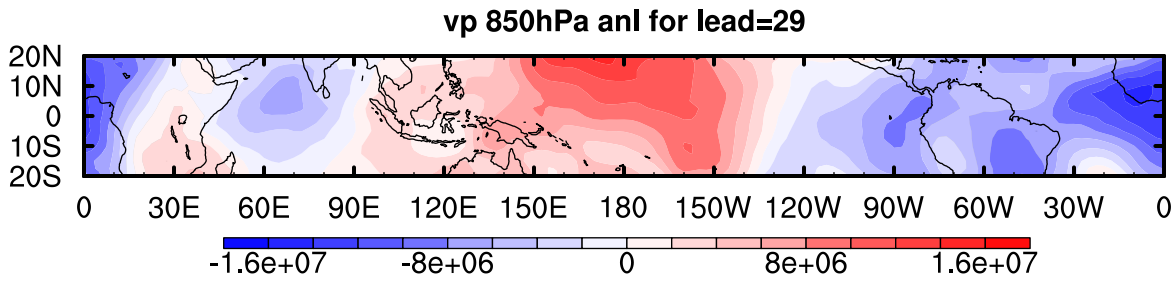
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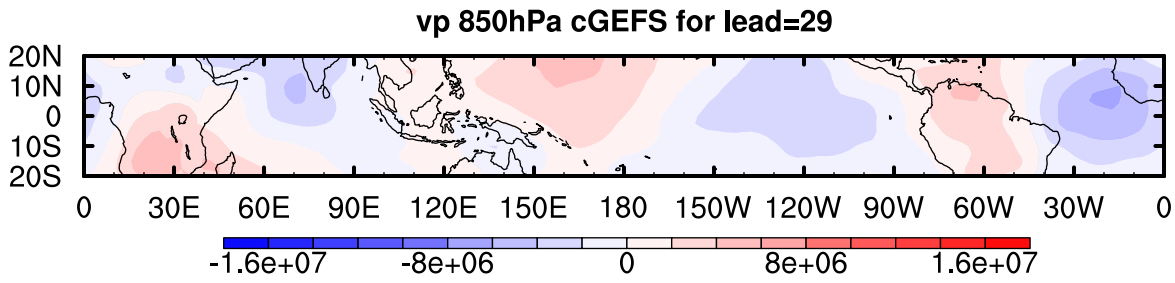
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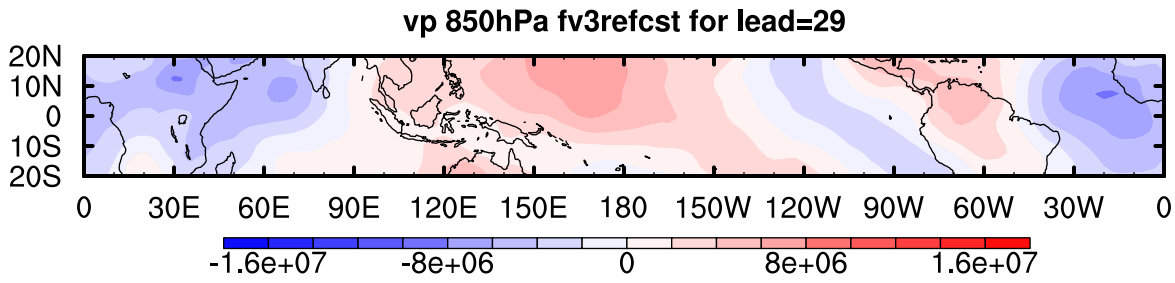
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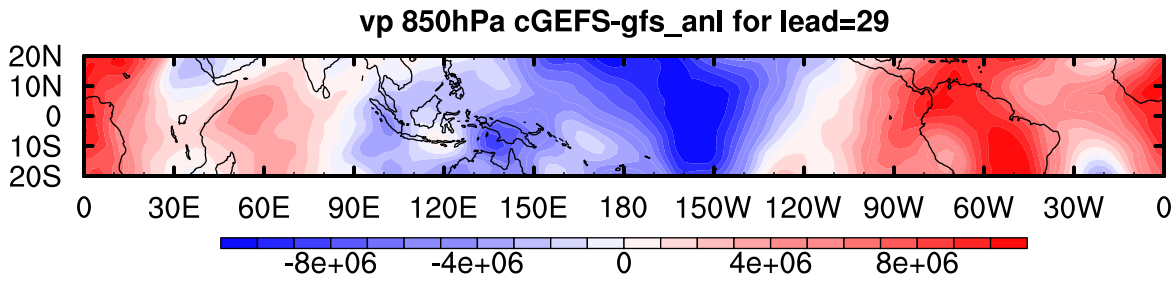
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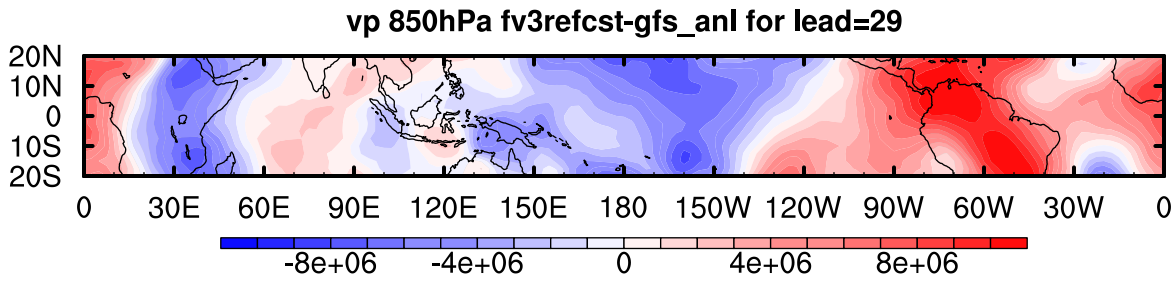
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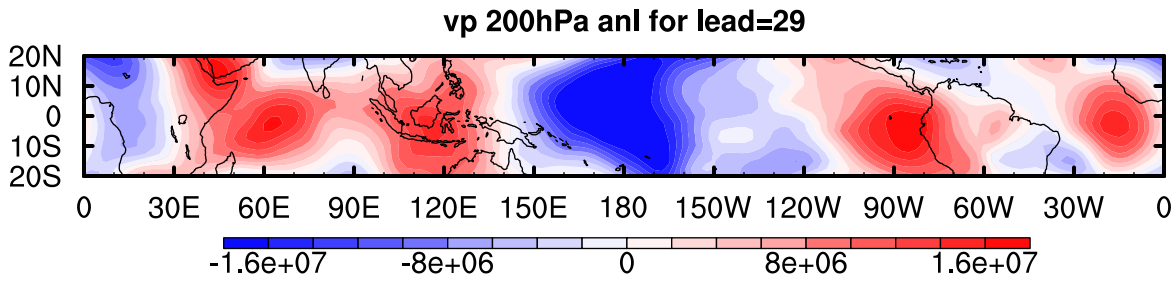
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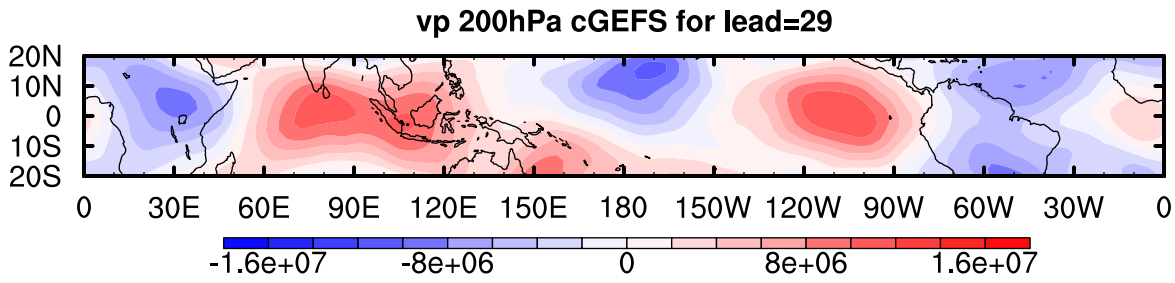
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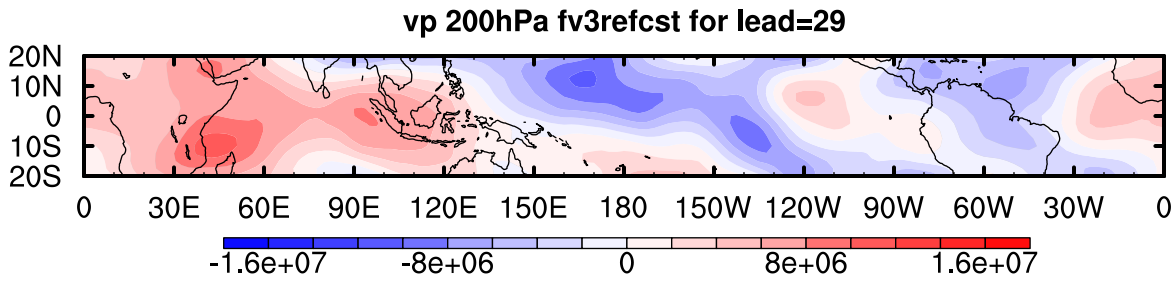
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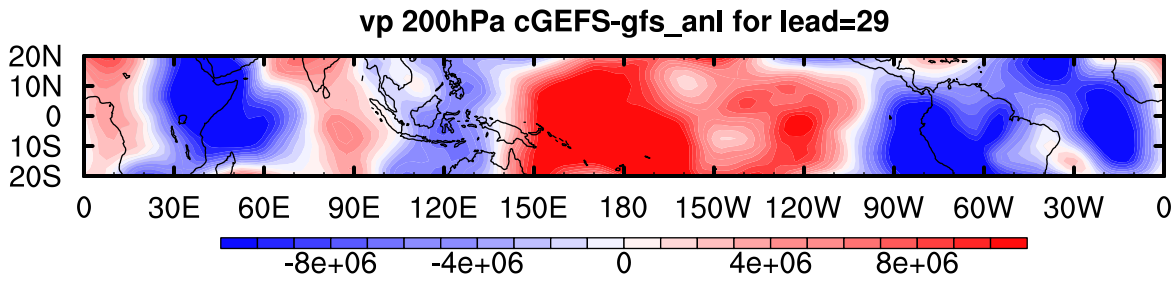
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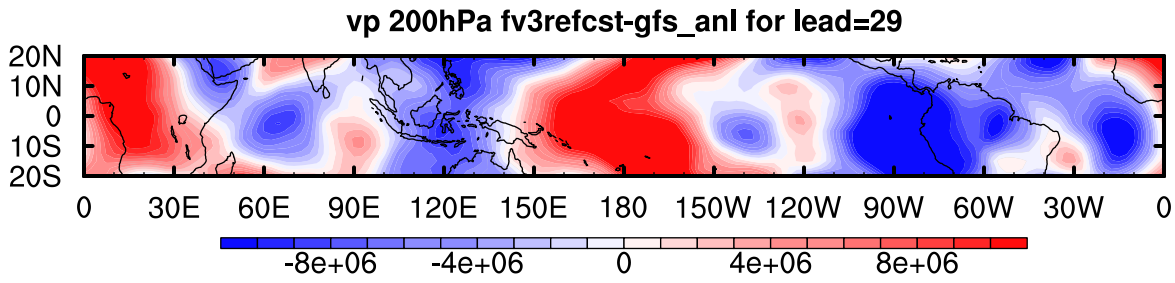
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10N
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10S
20S
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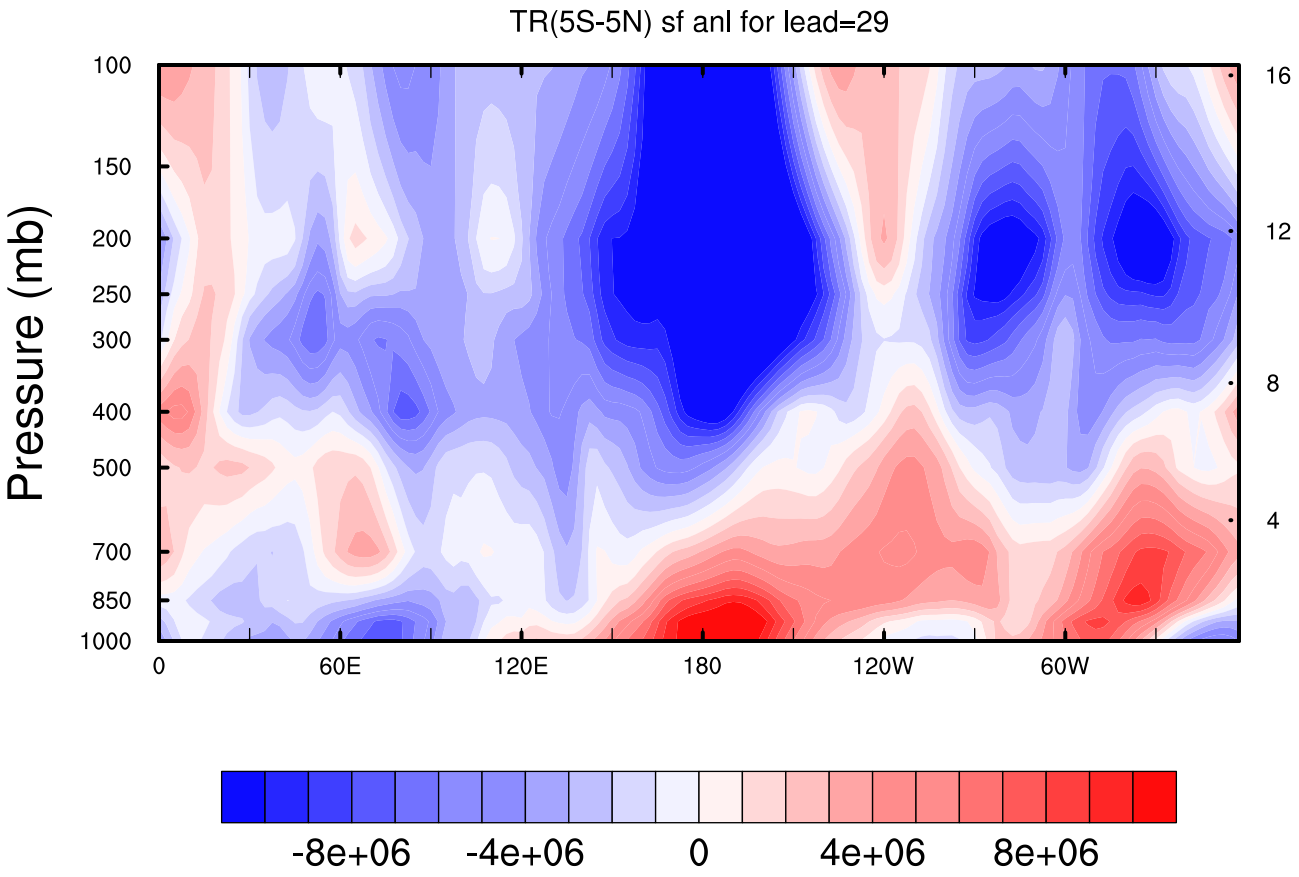
TR(5S-5N) sf anl for lead=29
Pressure (mb)
100
150
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250
300
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500
700
850
1000
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120E
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60W
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4
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-4e+06
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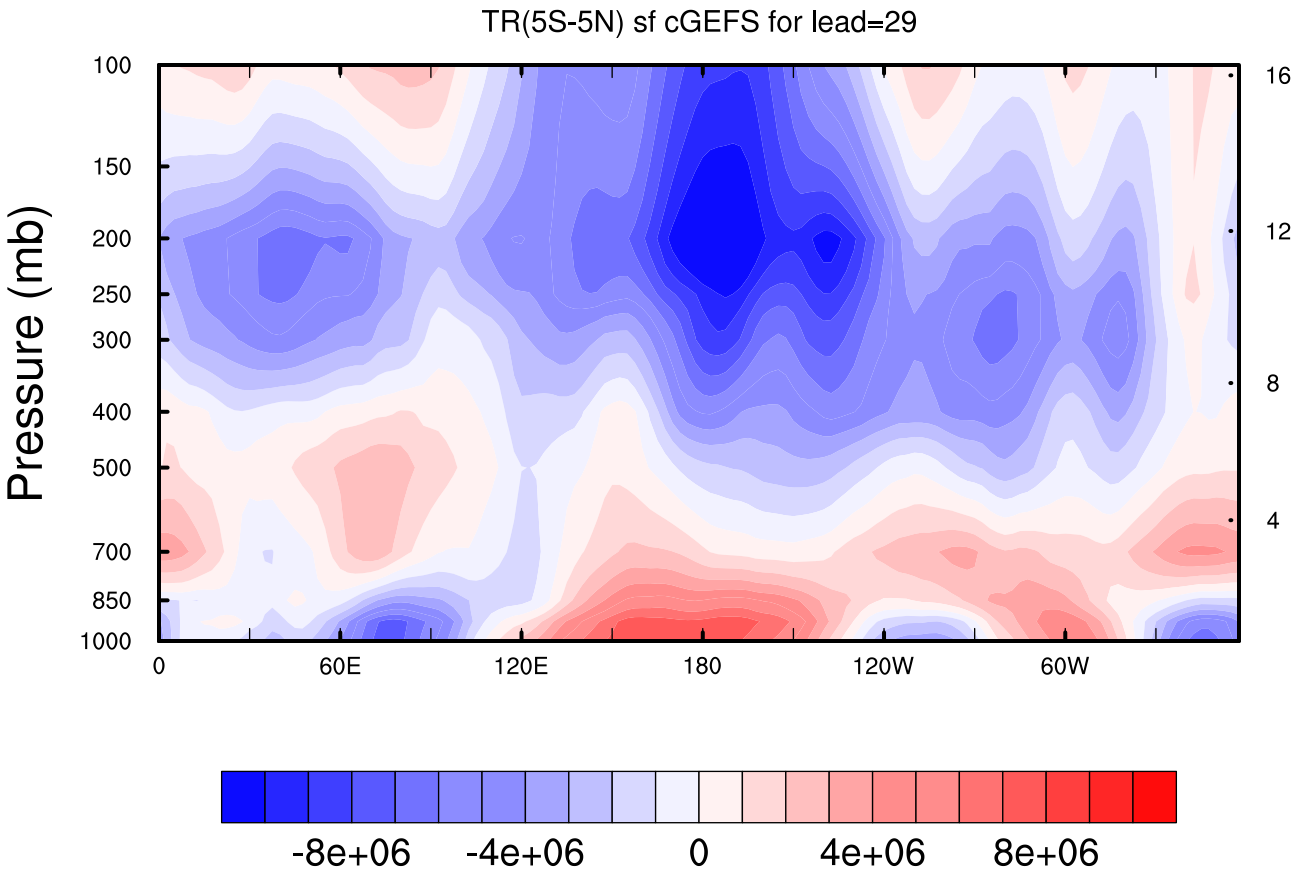
8e+06


TR(5S-5N) sf cGEFS for lead=29
Pressure (mb)
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1000
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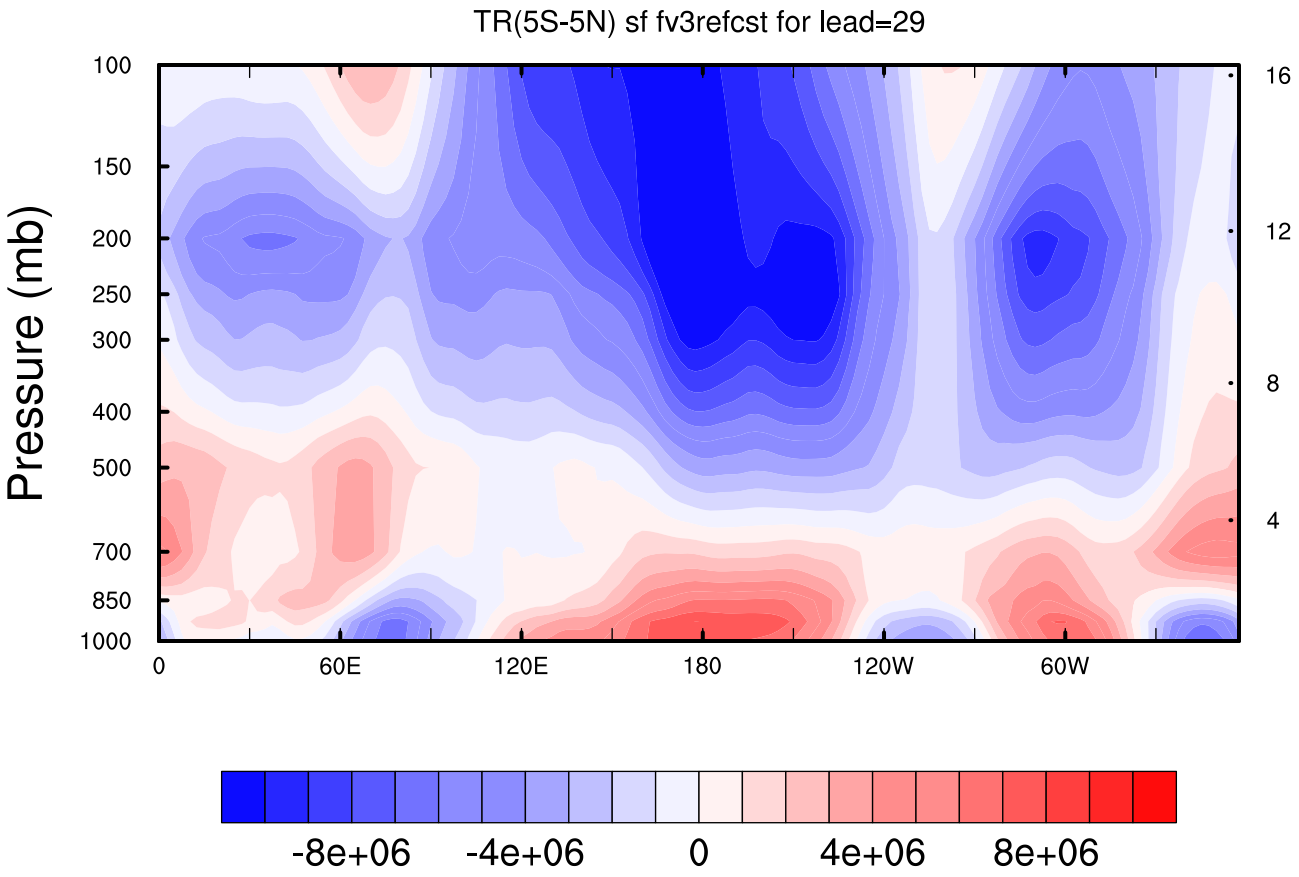
TR(5S-5N) sf fv3refcst for lead=29
Pressure (mb)
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1000
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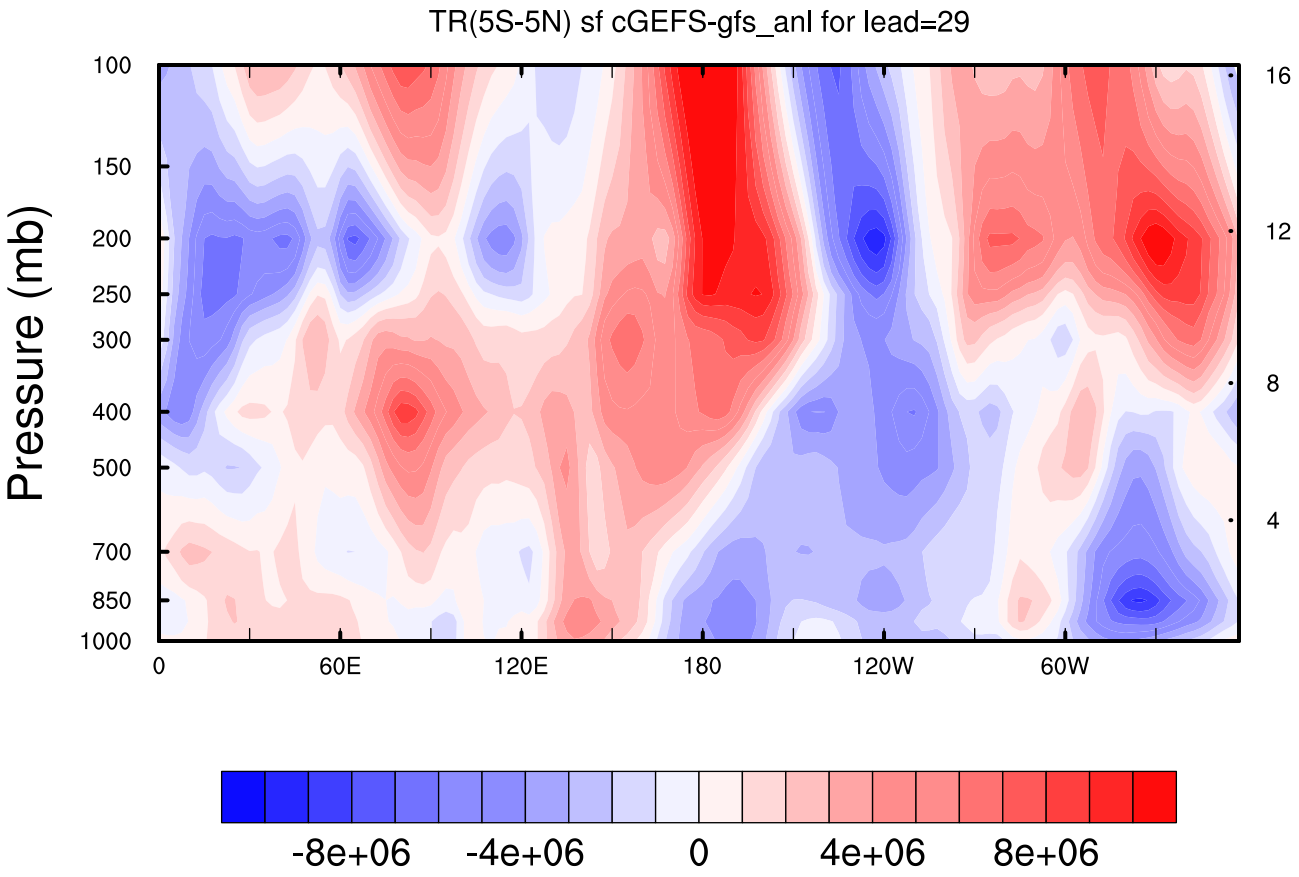
TR(5S-5N) sf cGEFS-gfs_anl for lead=29
Pressure (mb)
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300
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500
700
850
1000
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-4e+06
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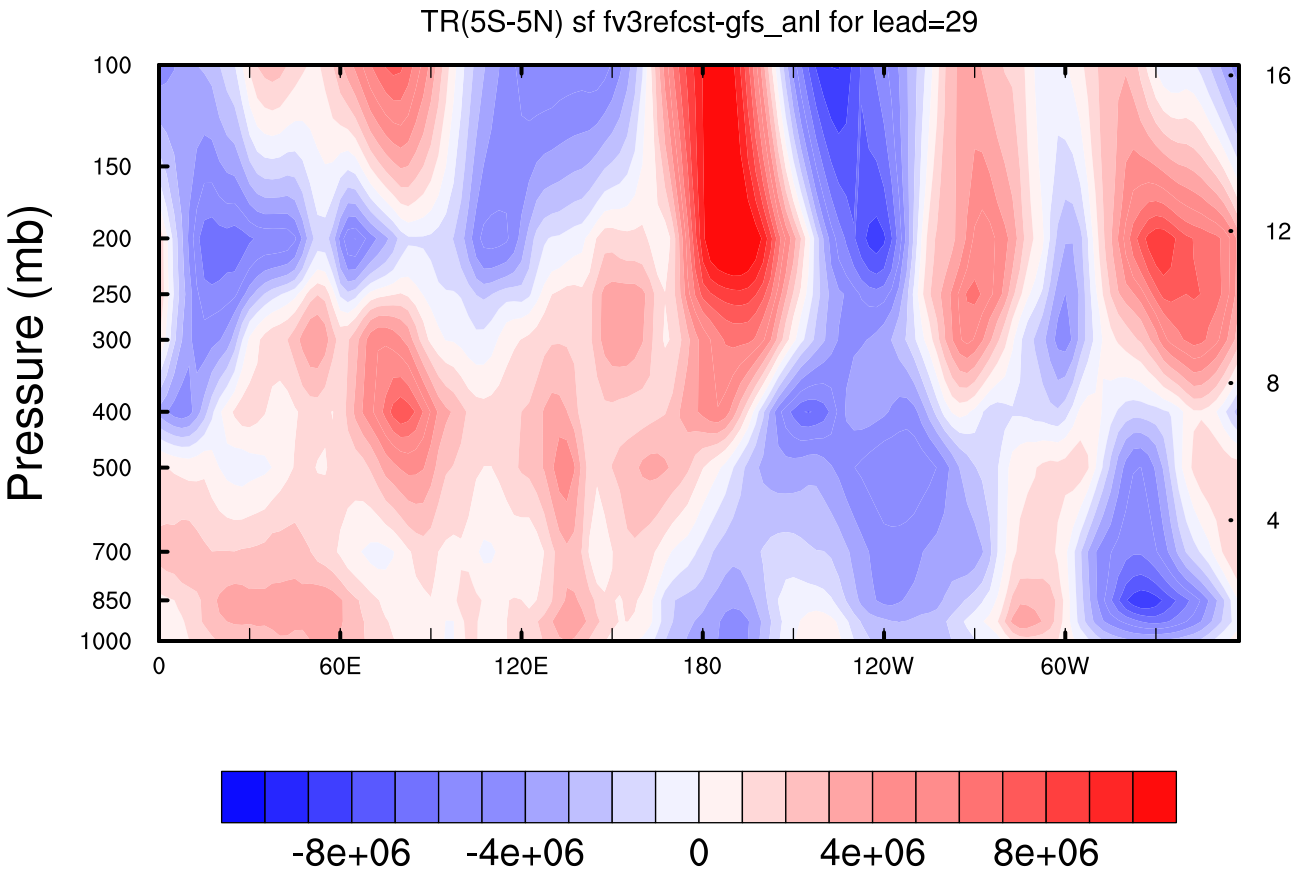
TR(5S-5N) sf fv3refcst-gfs_anl for lead=29
Pressure (mb)
100
150
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250
300
400
500
700
850
1000
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60W
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-4e+06
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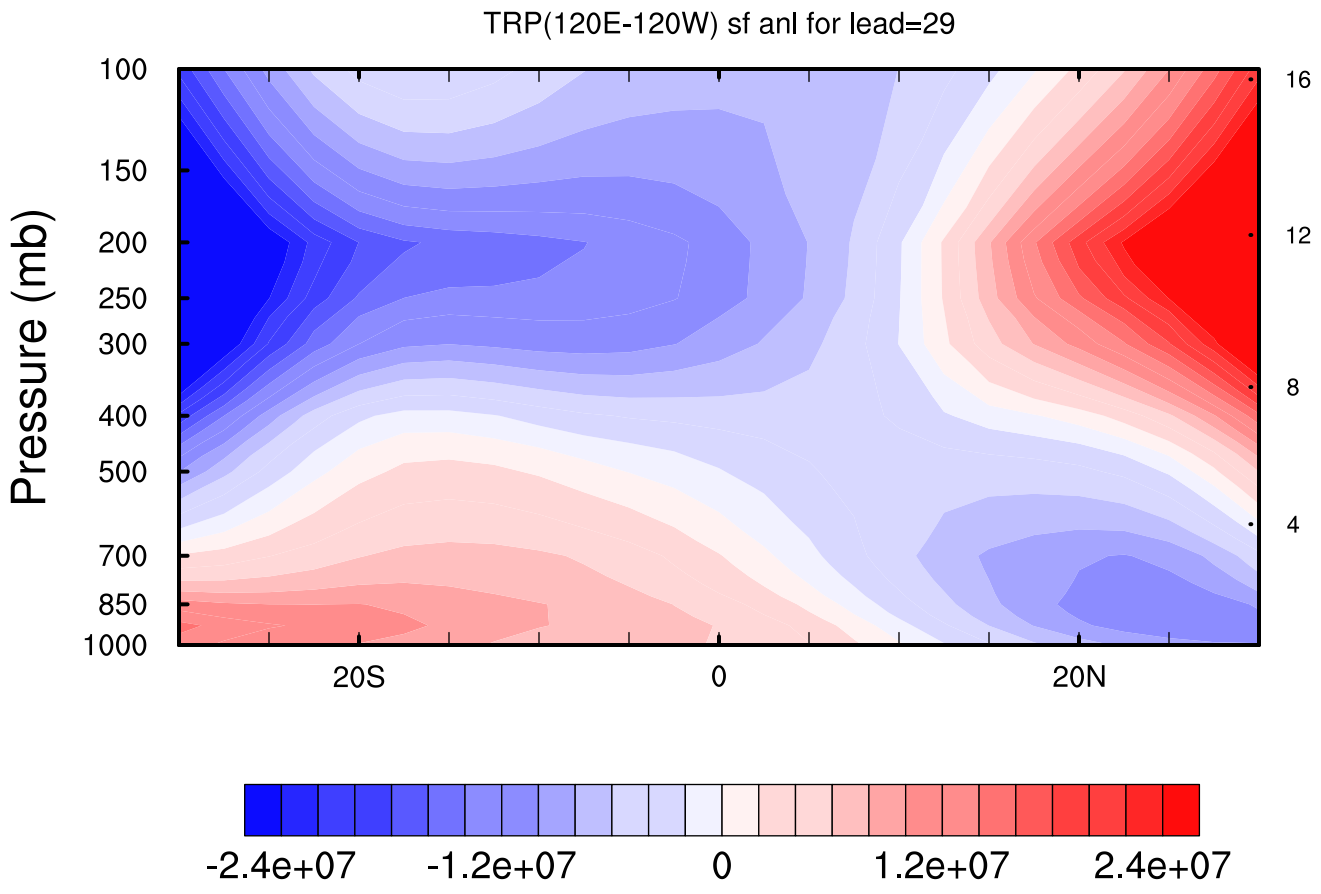
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Pressure (mb)
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200
250
300
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500
700
850
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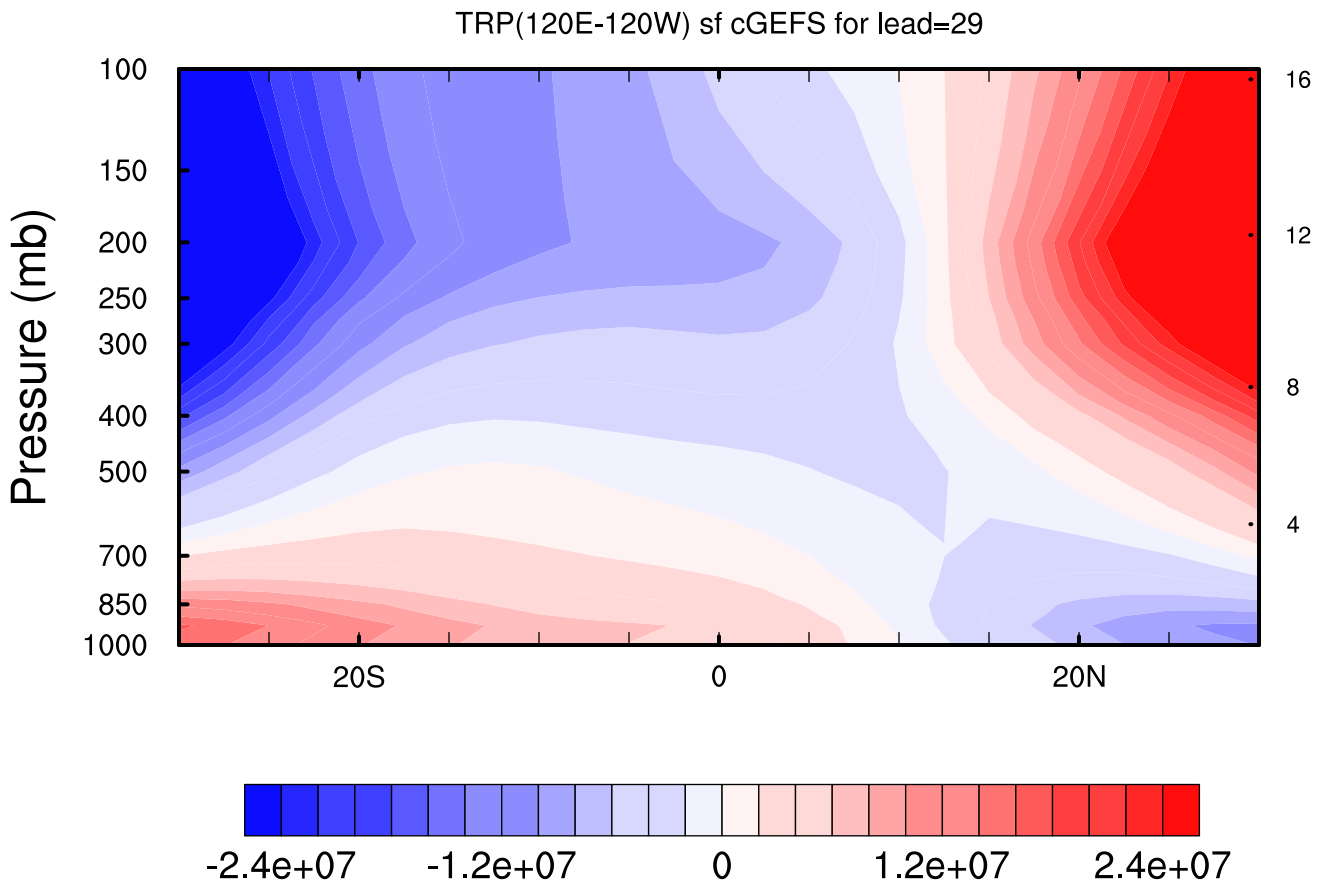
2.4e+07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Pressure (mb)
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300
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700
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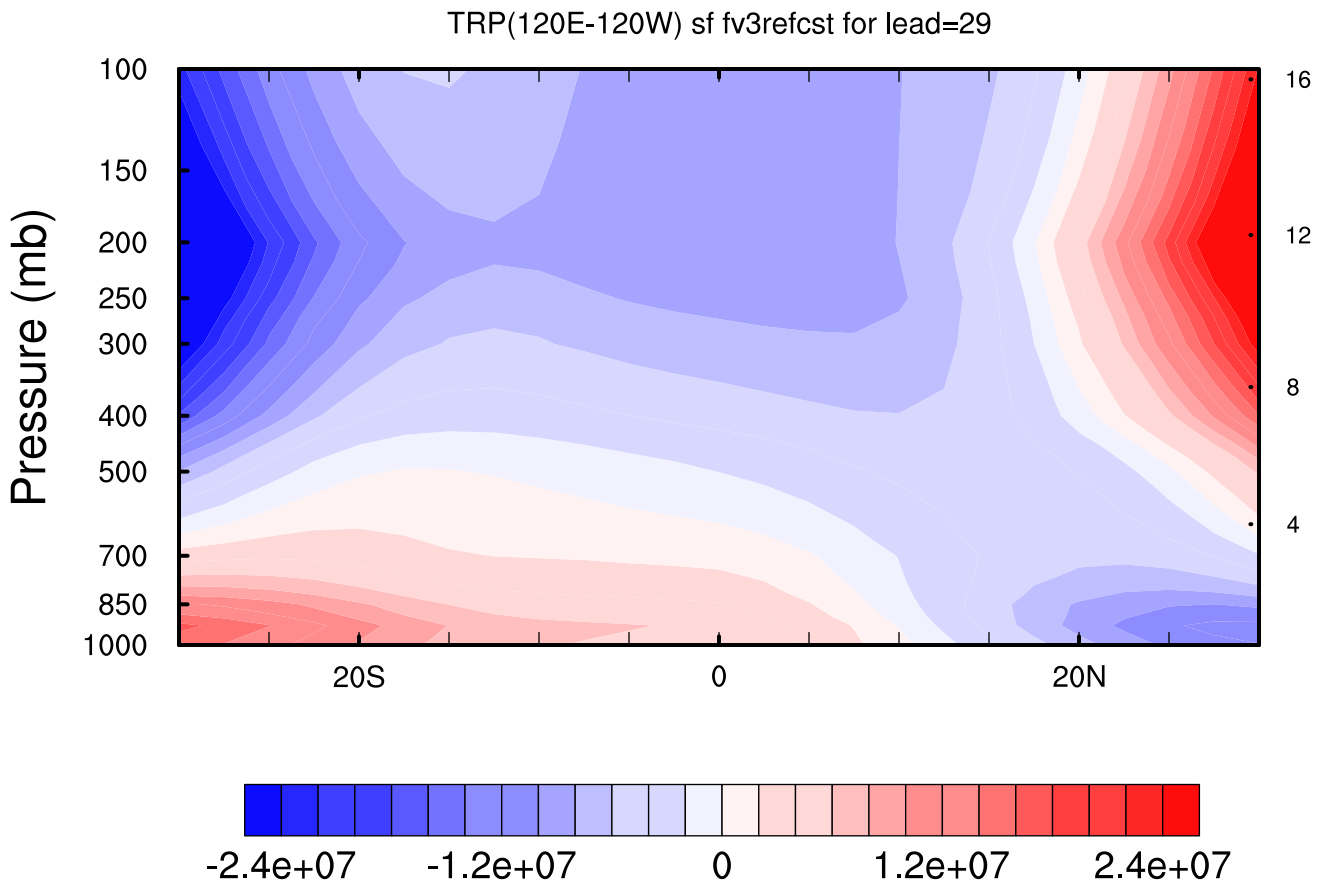
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Pressure (mb)
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700
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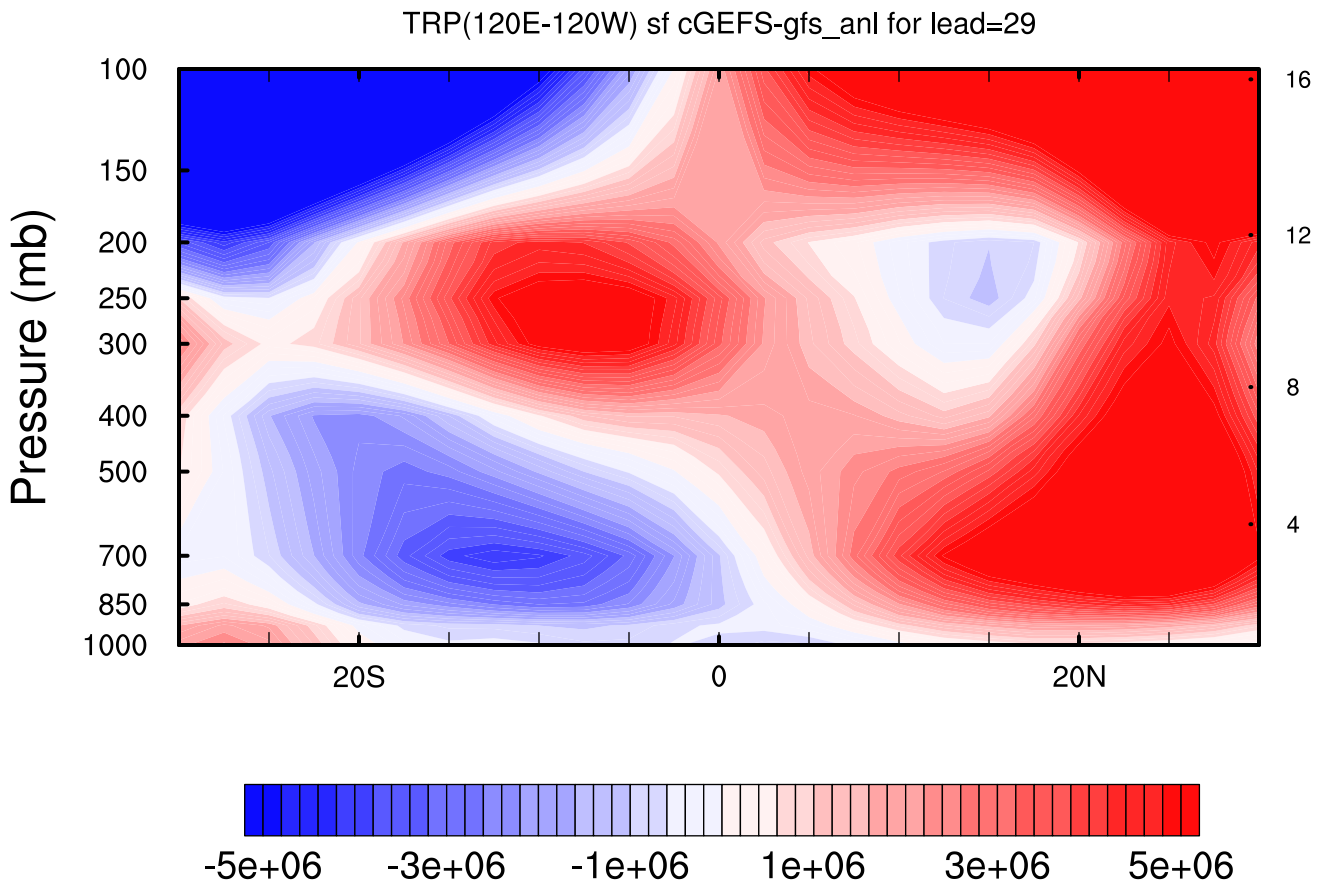
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Pressure (mb)
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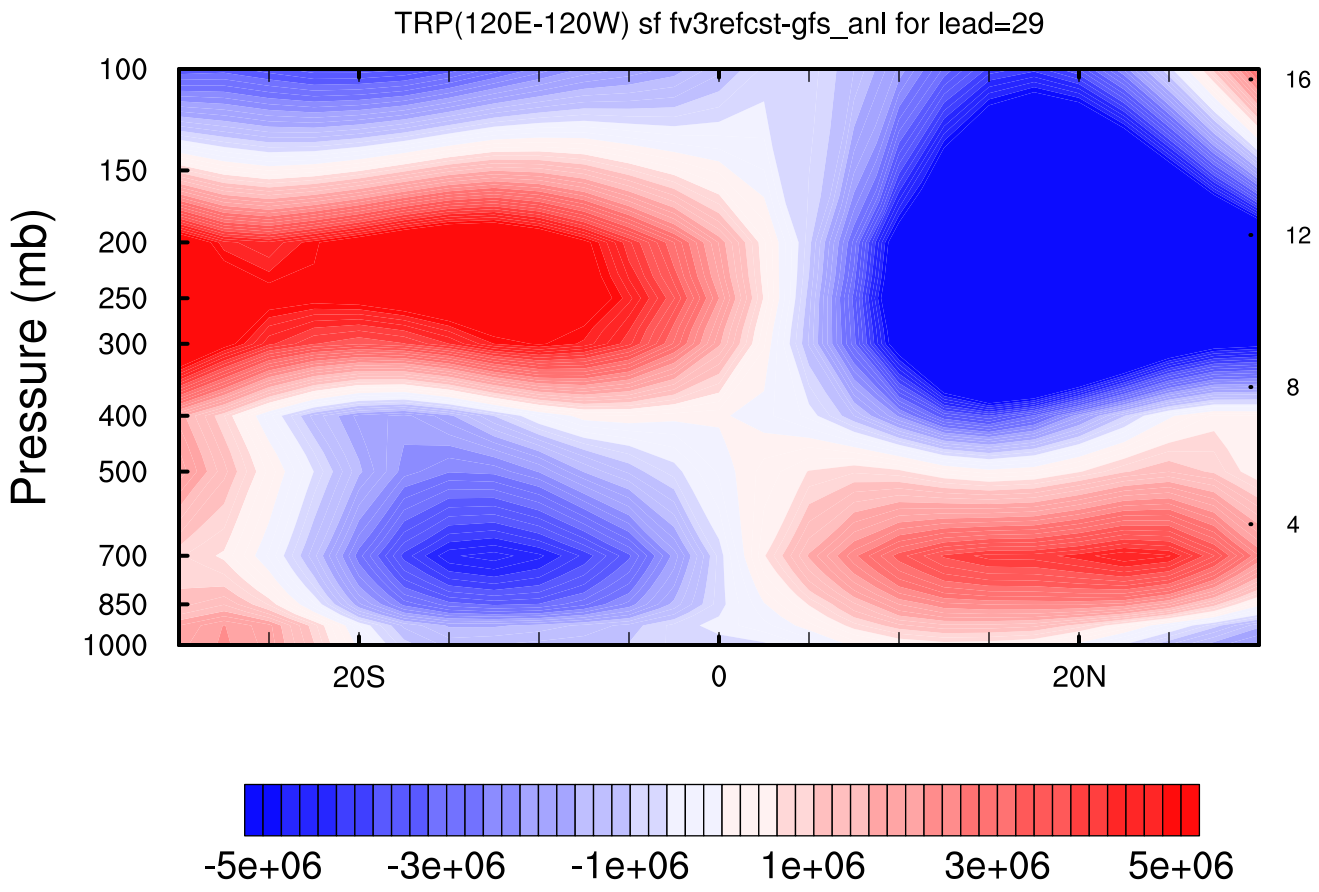
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Pressure (mb)
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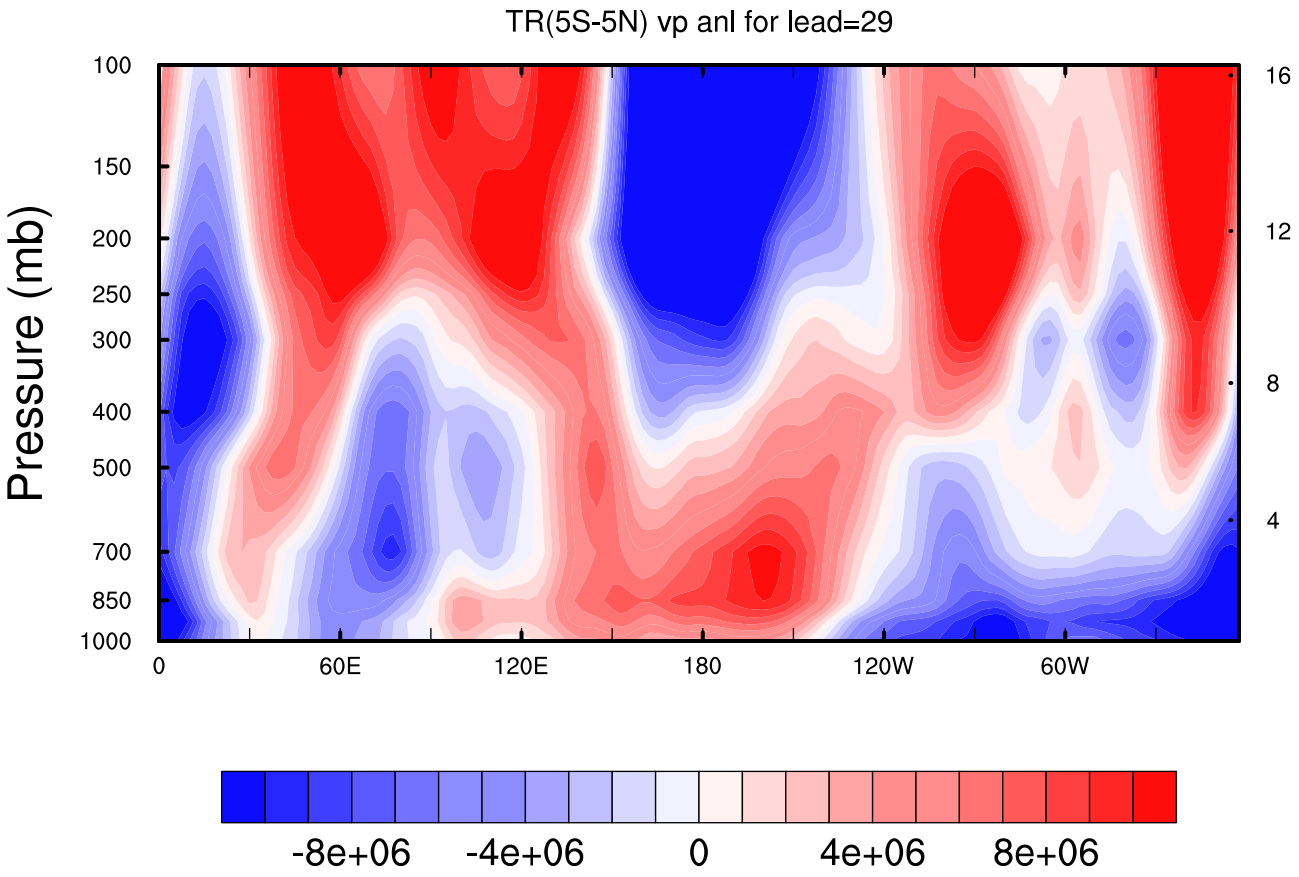
5e+06


TR(5S-5N) vp anl for lead=29
Pressure (mb)
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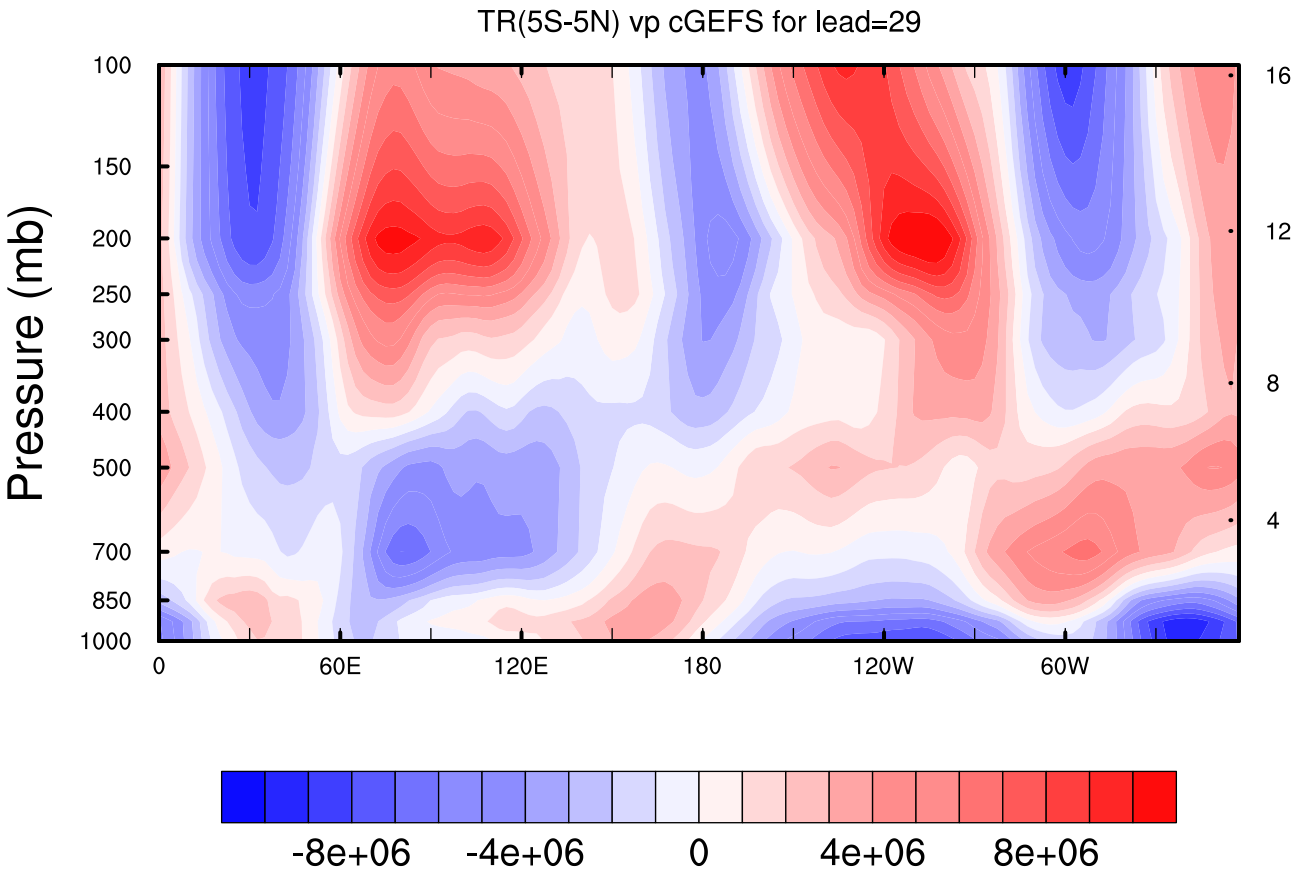
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Pressure (mb)
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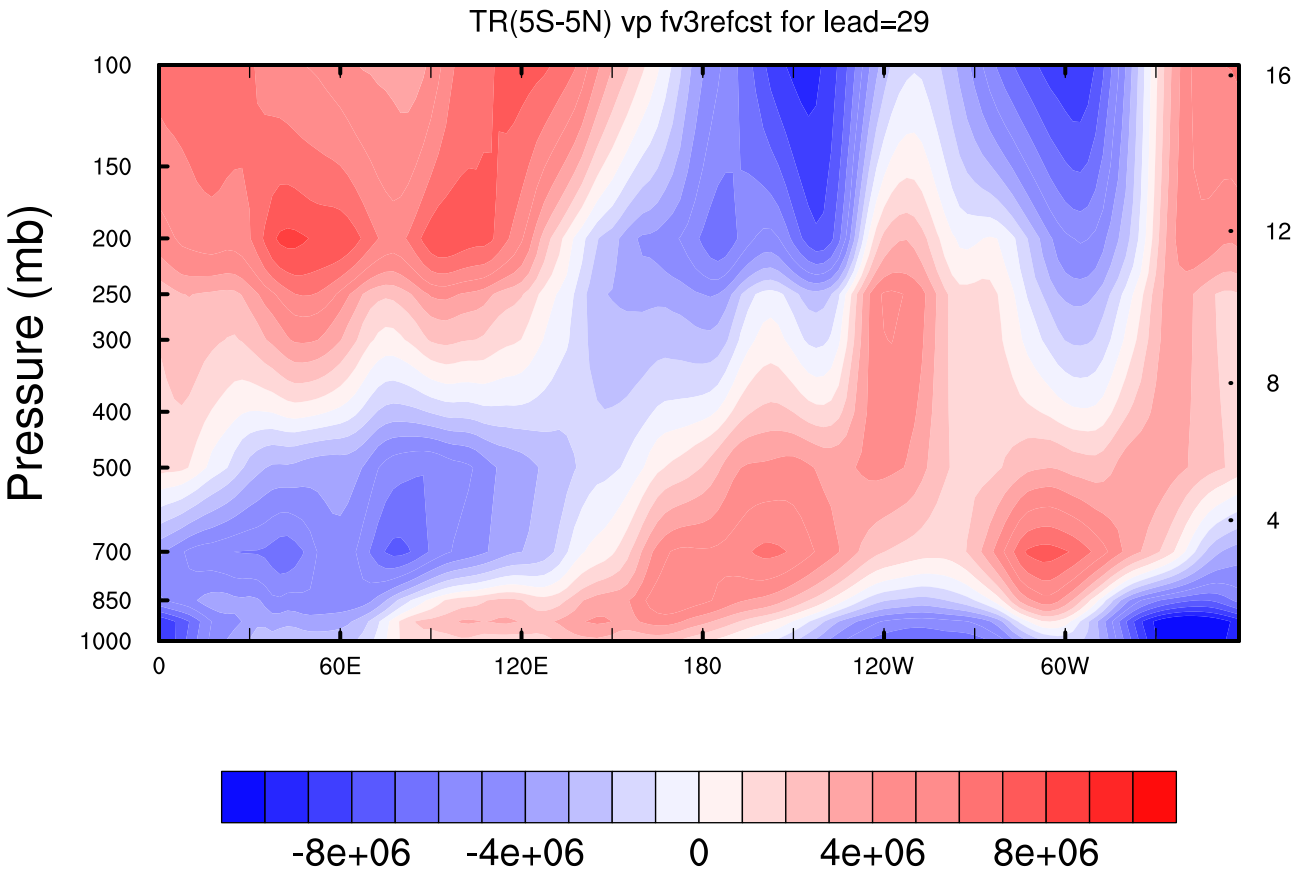
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Pressure (mb)
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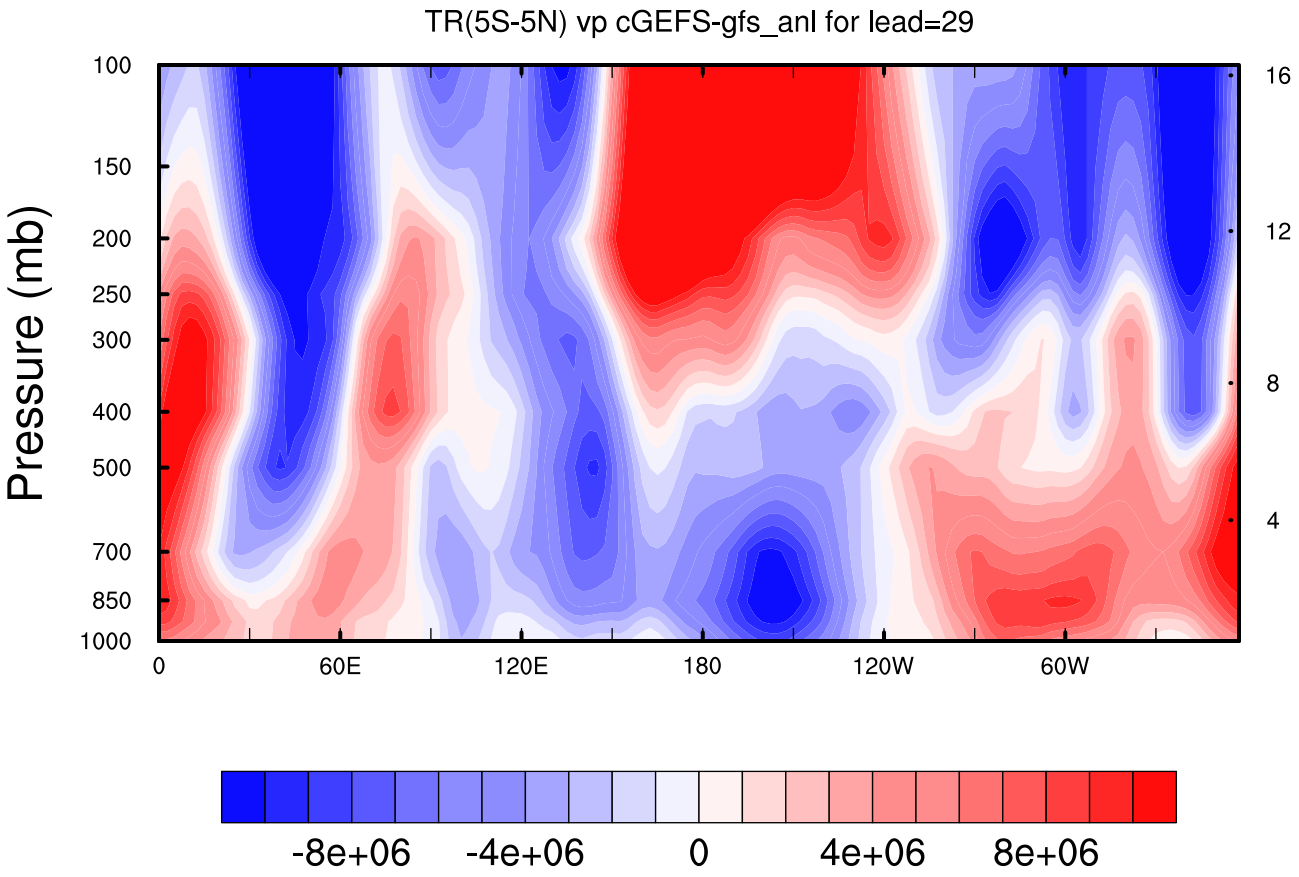
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Pressure (mb)
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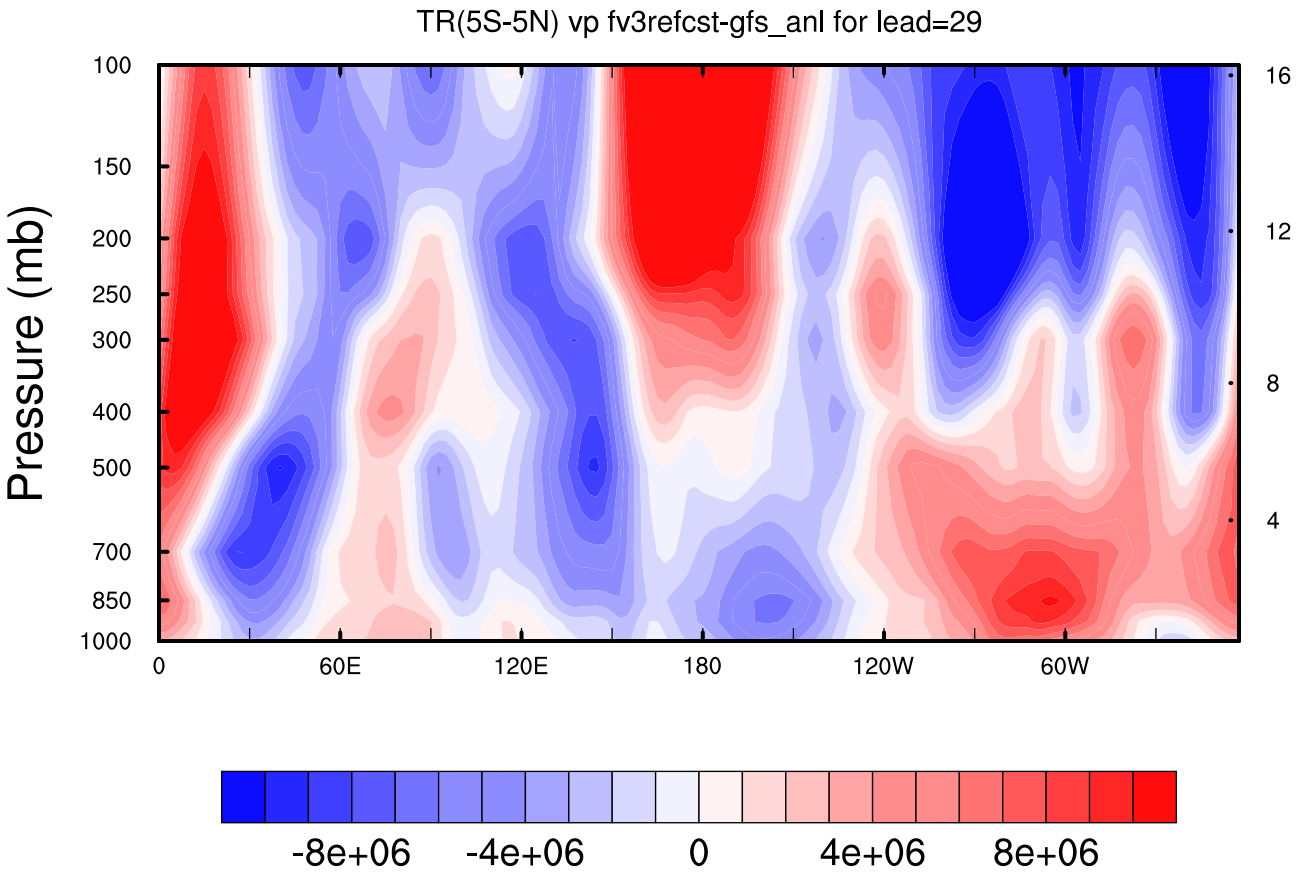
TR(5S-5N) vp fv3refcst-gfs_anl for lead=29
Pressure (mb)
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60W
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-4e+06
0
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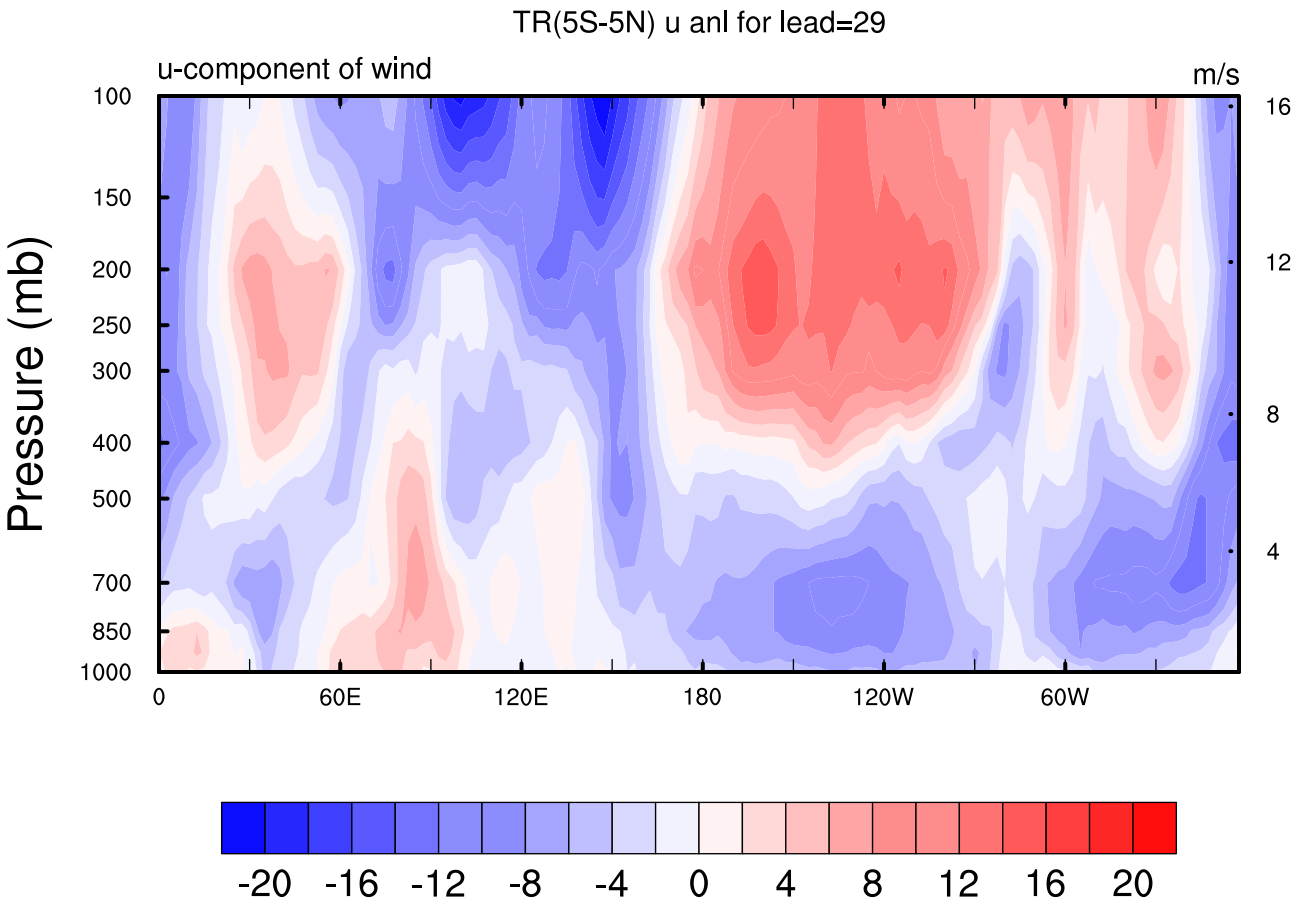
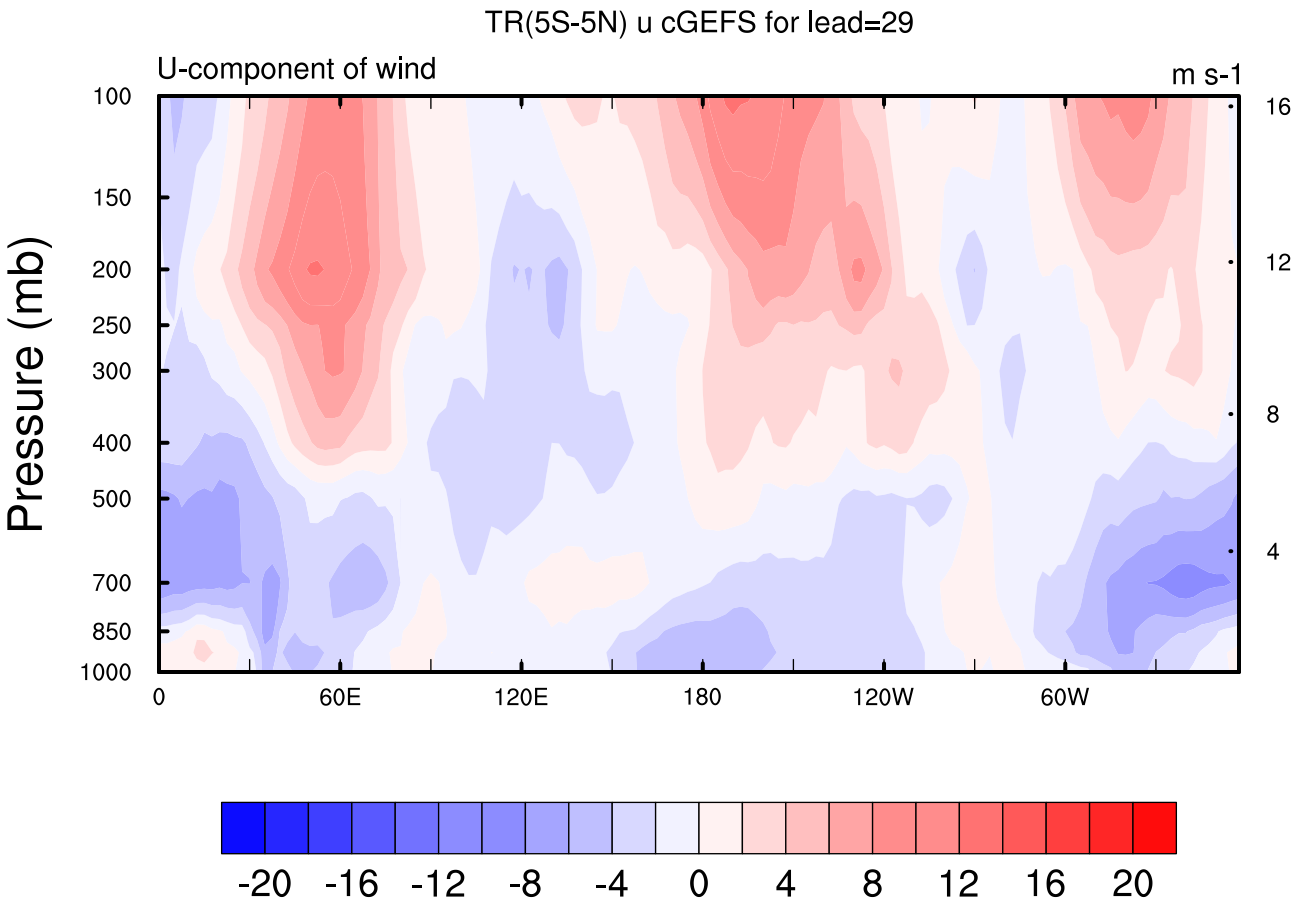
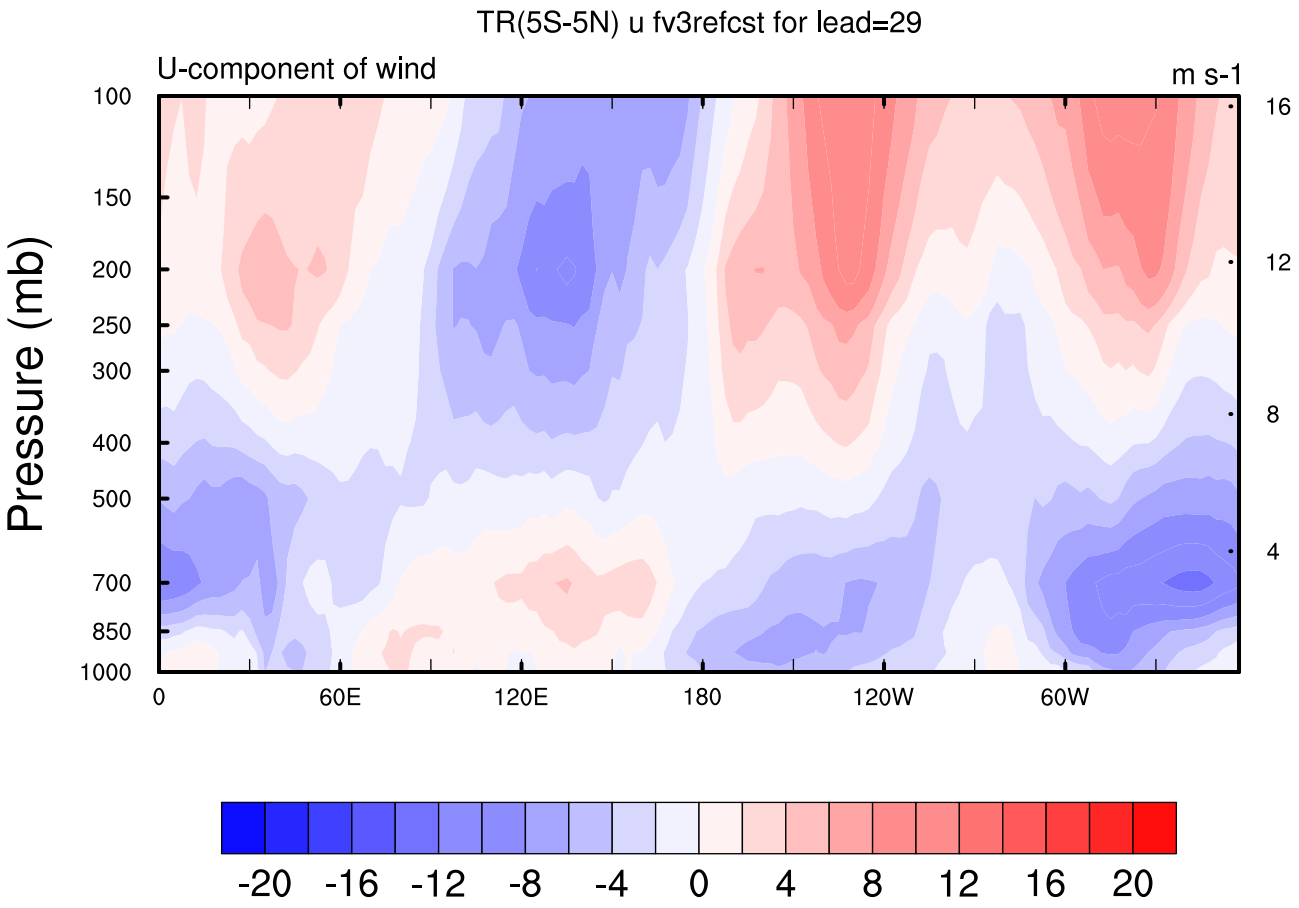
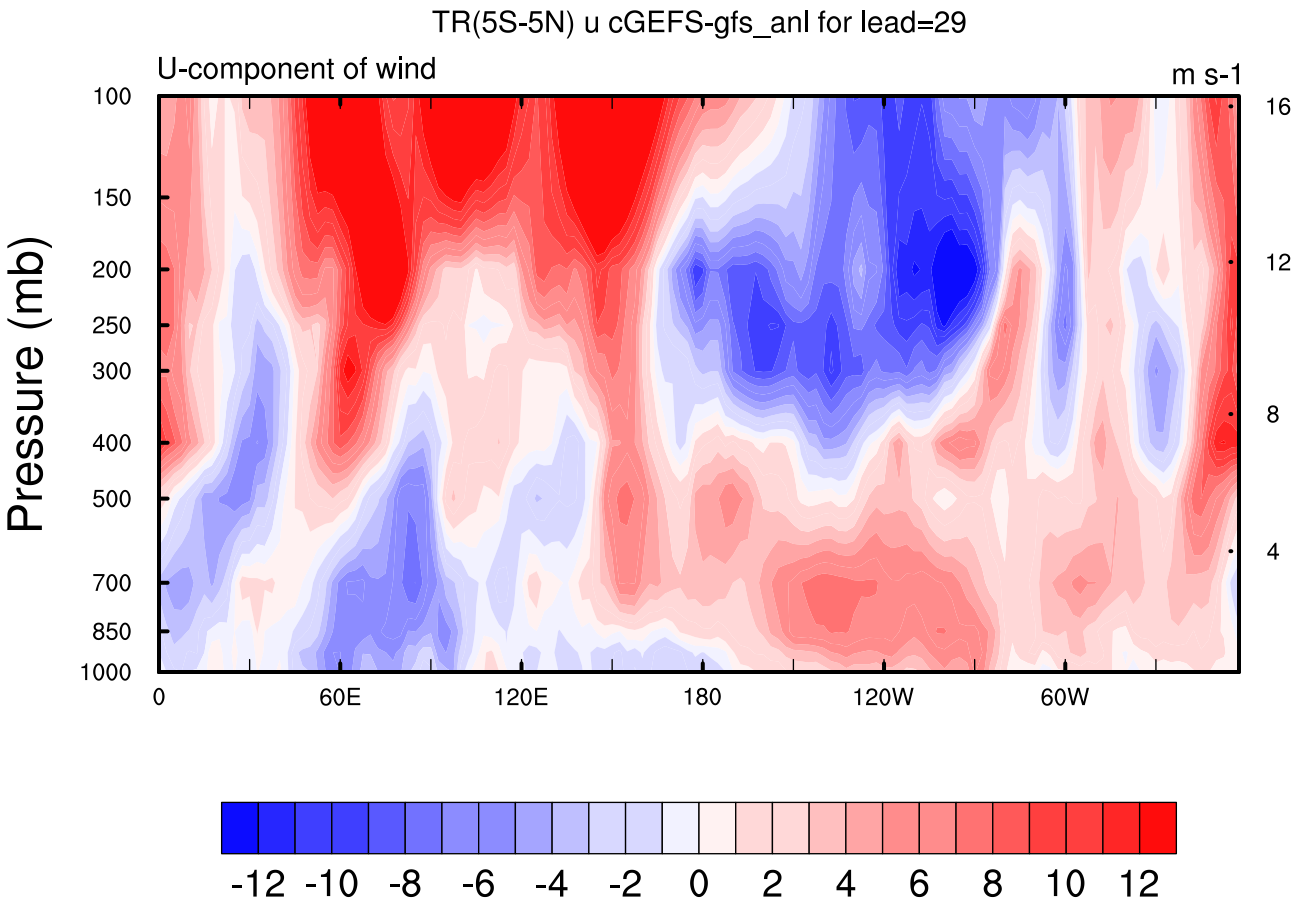
8e+06


TR(5S-5N) u anl for lead=29
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS for lead=29
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u fv3refcst for lead=29
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=29
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
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-2
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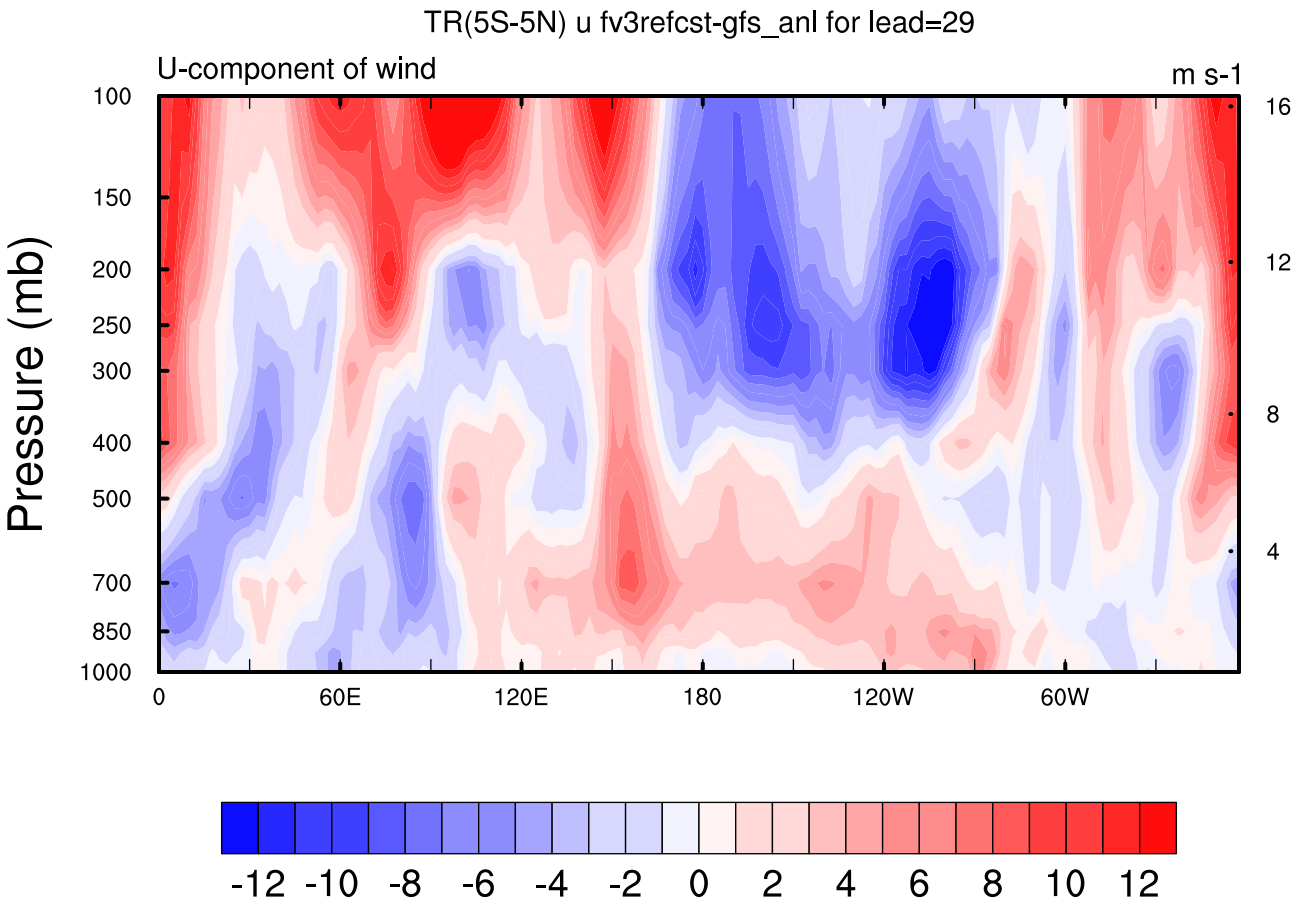
6
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=29
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
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-2
0
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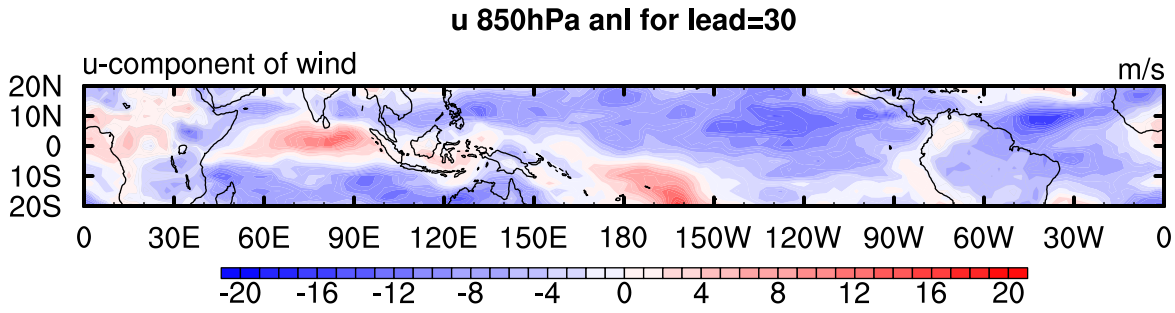
8
10
12


u 850hPa anl for lead=30
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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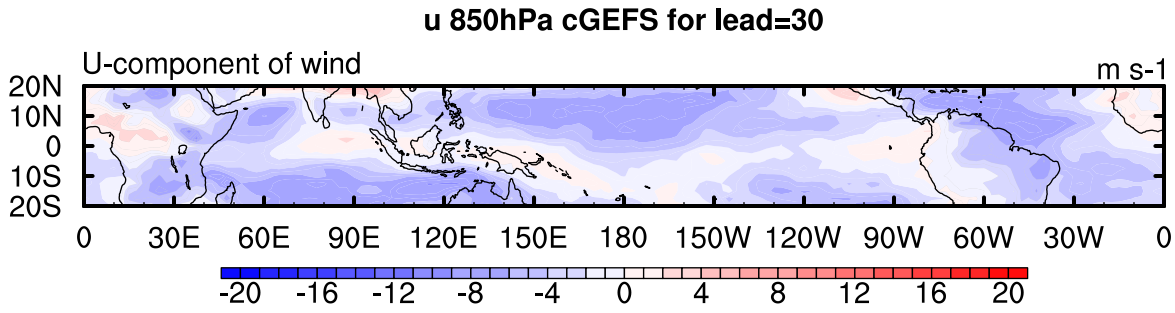
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS for lead=30
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-20
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-12
-8
-4
0
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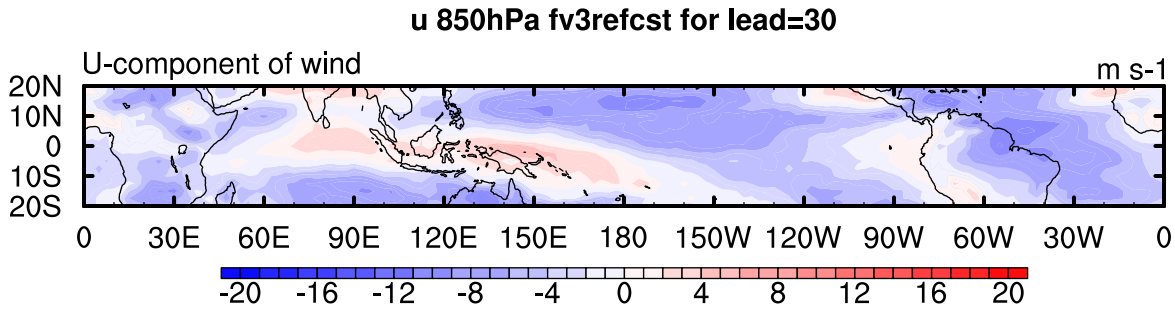
8
12
16
20


u 850hPa fv3refcst for lead=30
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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60W
30W
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-4
0
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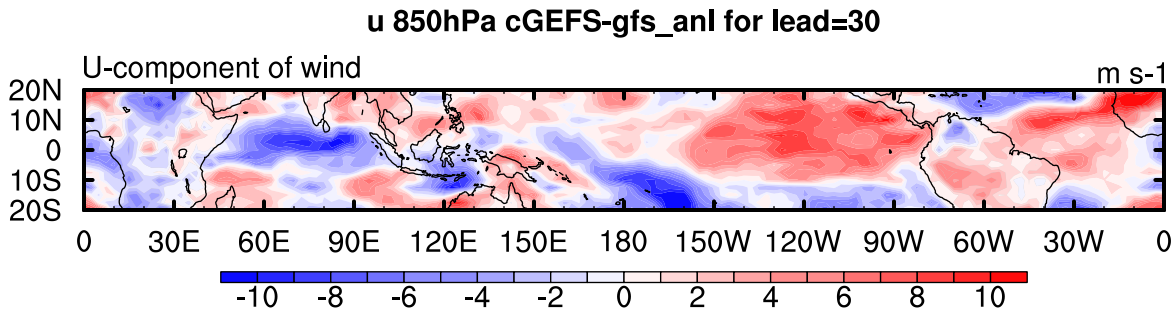
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=30
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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30W
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-10
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-6
-4
-2
0
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4
6
8
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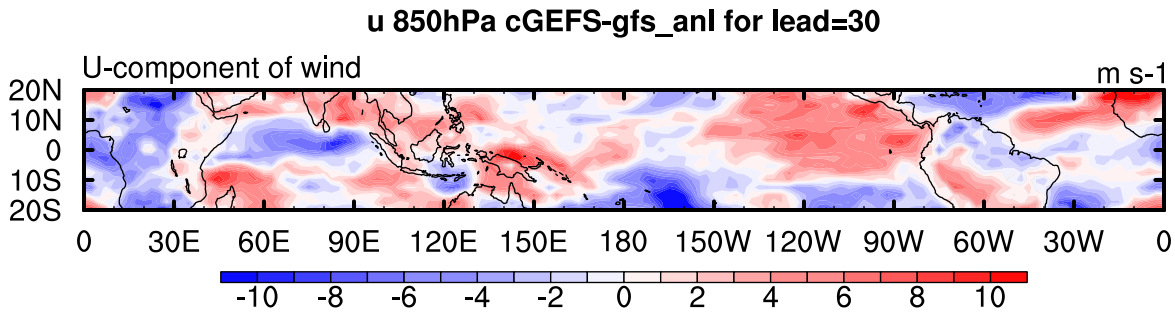
u 850hPa cGEFS-gfs_anl for lead=30
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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60W
30W
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-10
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-6
-4
-2
0
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4
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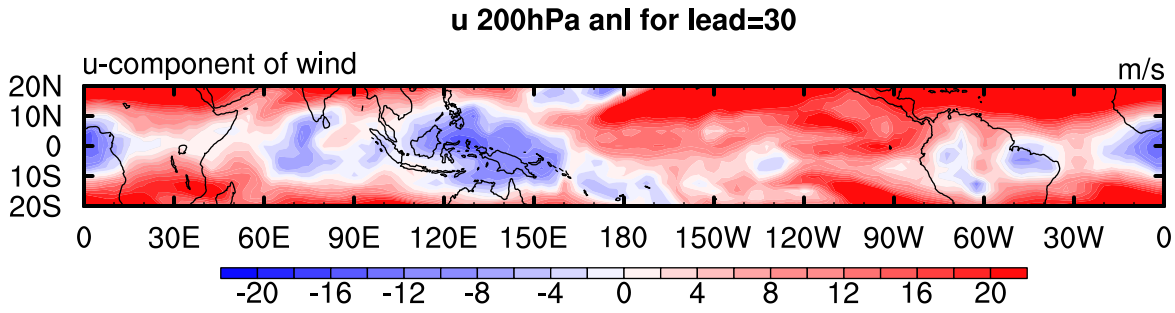
u 200hPa anl for lead=30
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-4
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8
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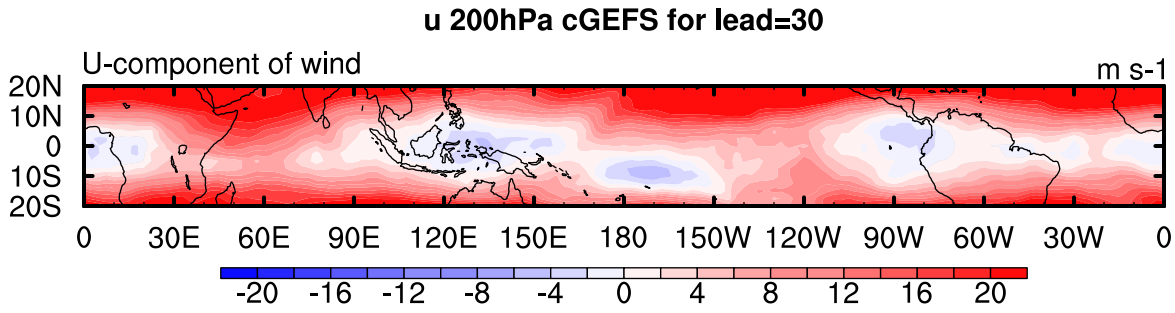
16
20


u 200hPa cGEFS for lead=30
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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120W
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60W
30W
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-20
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-8
-4
0
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8
12
16
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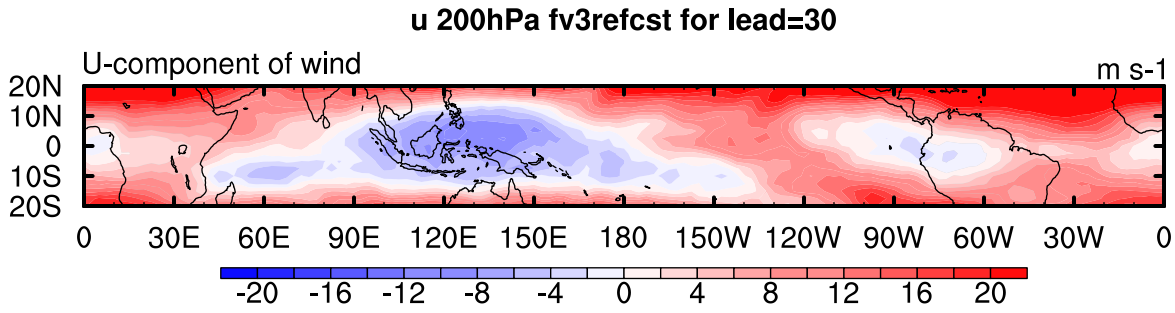
u 200hPa fv3refcst for lead=30
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
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60W
30W
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-4
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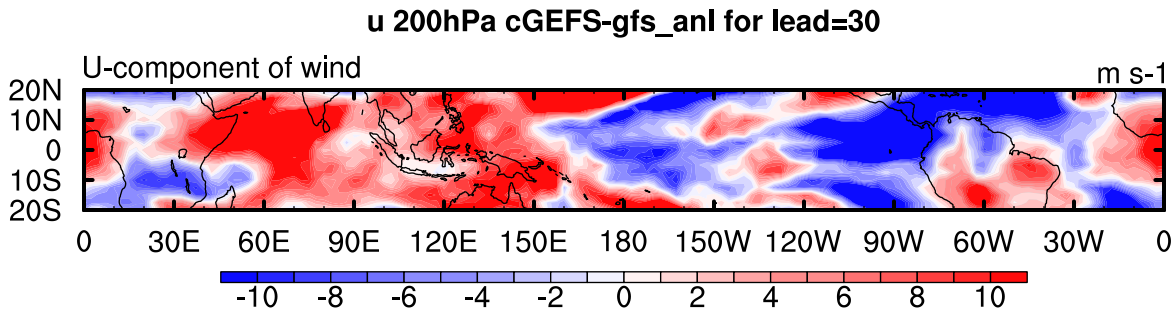
16
20


u 200hPa cGEFS-gfs_anl for lead=30
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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-2
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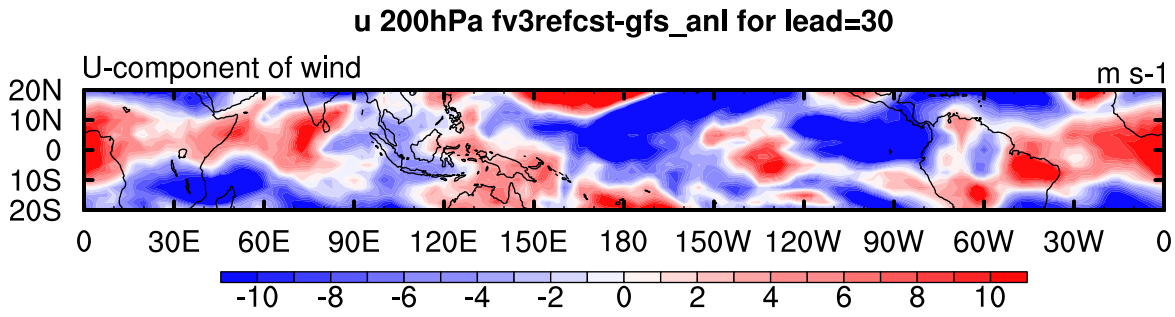
u 200hPa fv3refcst-gfs_anl for lead=30
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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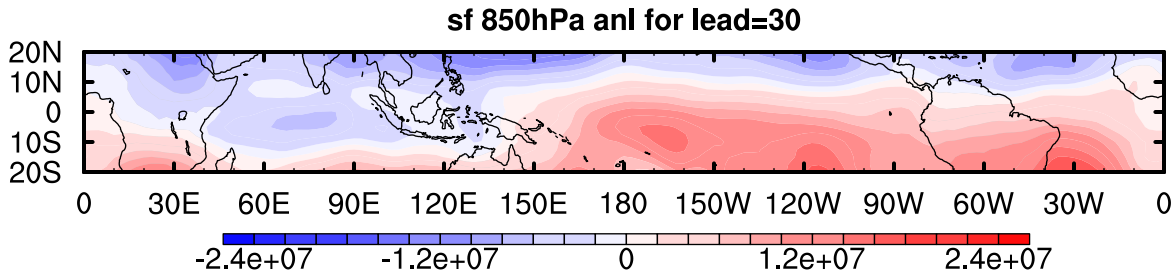
sf 850hPa anl for lead=30
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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120W
90W
60W
30W
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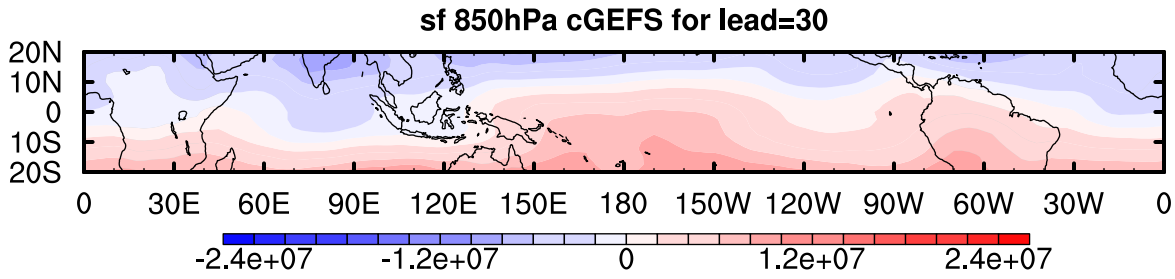
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=30
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10N
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10S
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120E
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30W
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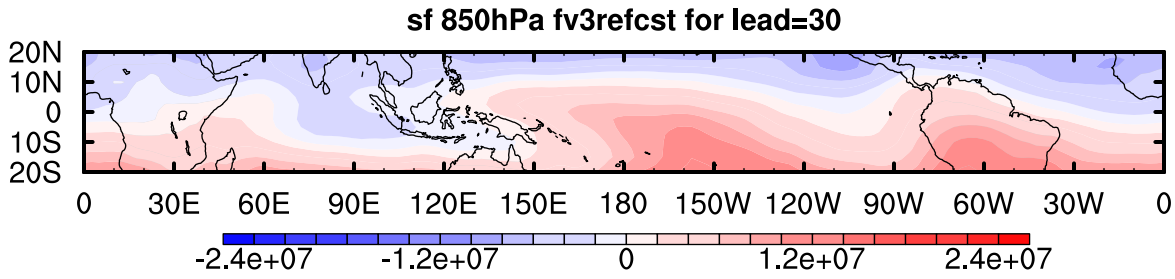
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=30
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10N
0
10S
20S
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30E
60E
90E
120E
150E
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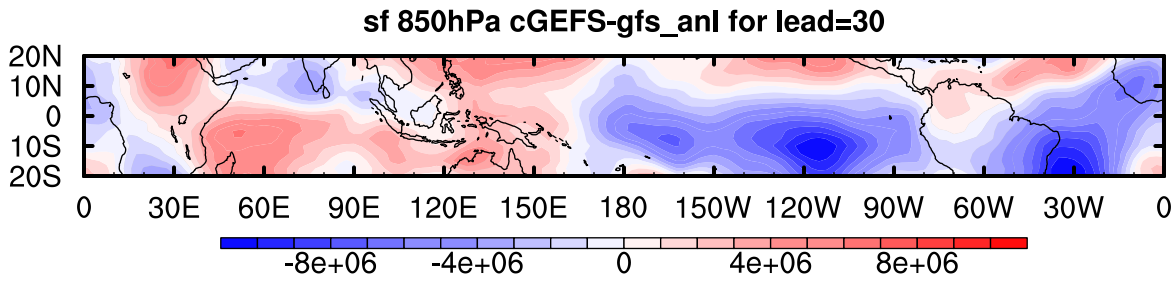
sf 850hPa cGEFS-gfs_anl for lead=30
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10N
0
10S
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90E
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30W
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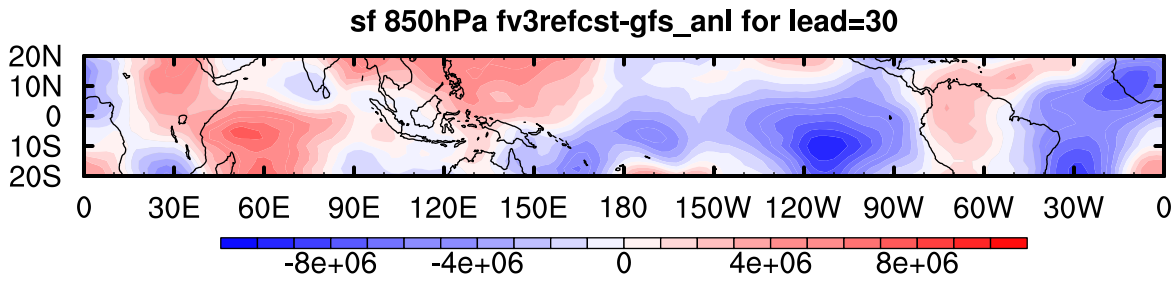
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=30
20N
10N
0
10S
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0
30E
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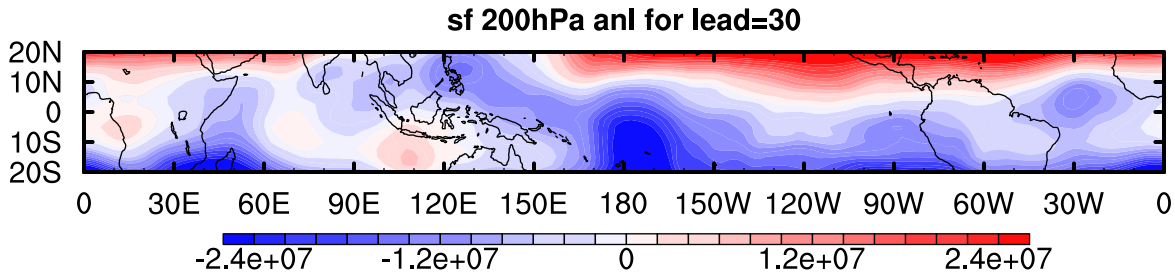
sf 200hPa anl for lead=30
20N
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0
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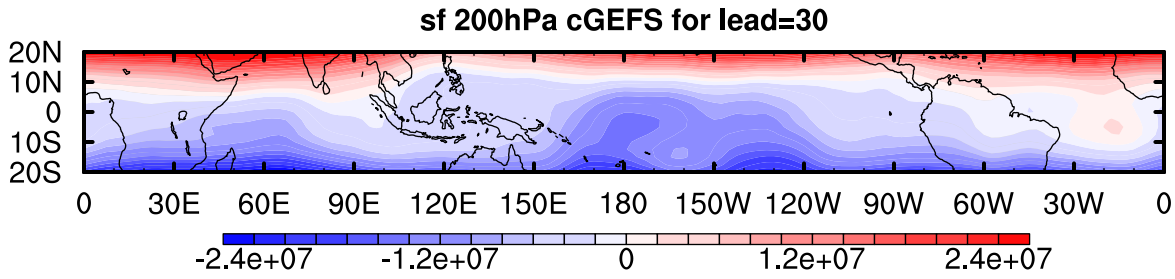
sf 200hPa cGEFS for lead=30
20N
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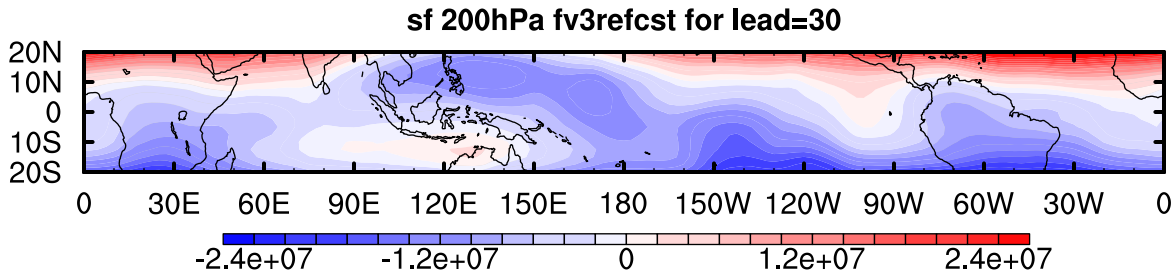
sf 200hPa fv3refcst for lead=30
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10N
0
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20S
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150E
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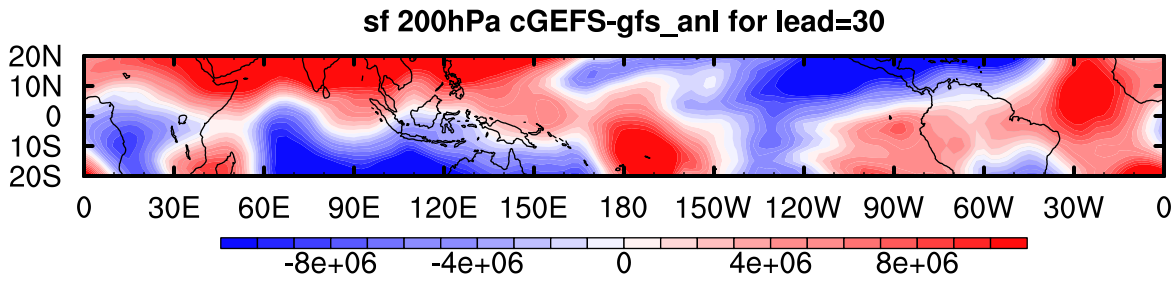
2.4e+07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10N
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10S
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90E
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30W
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-4e+06
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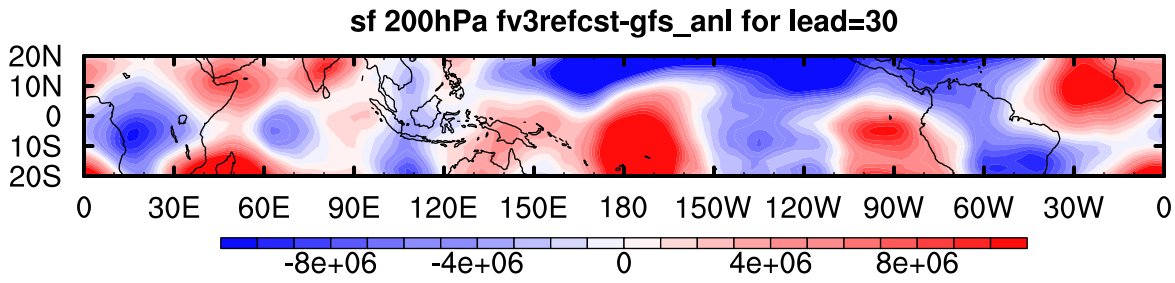
8e+06


sf 200hPa fv3refcst-gfs_anl for lead=30
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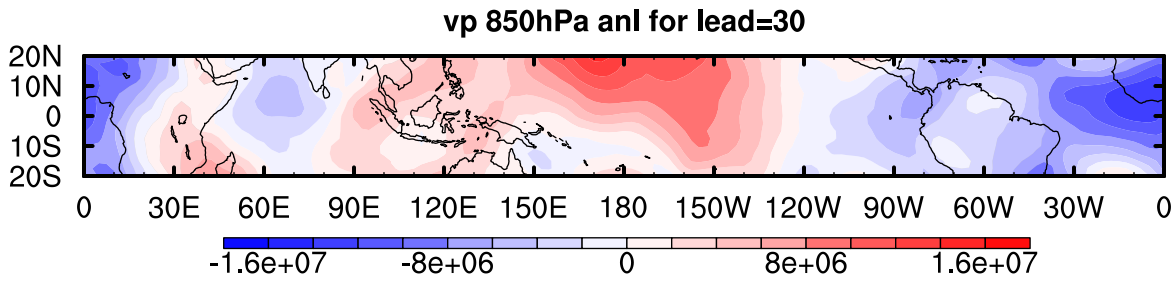
vp 850hPa anl for lead=30
20N
10N
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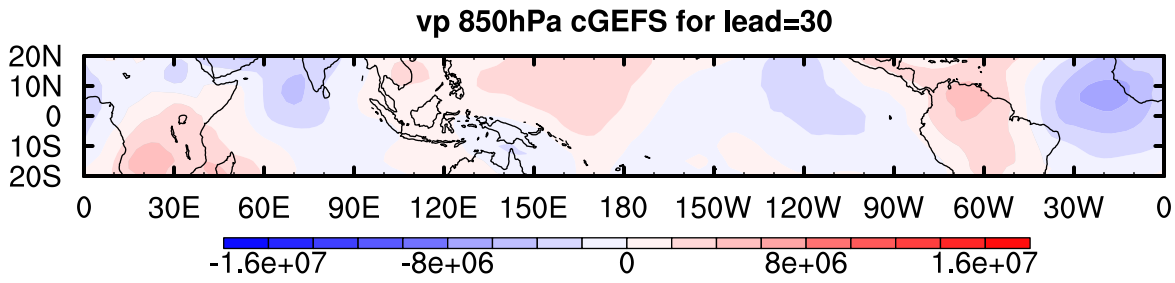
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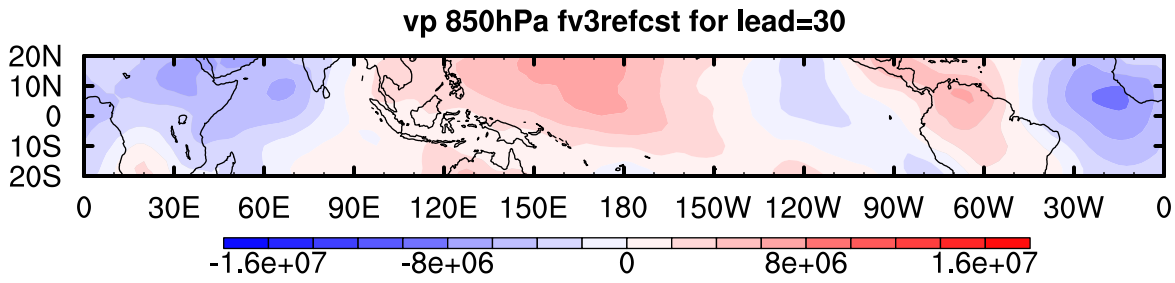
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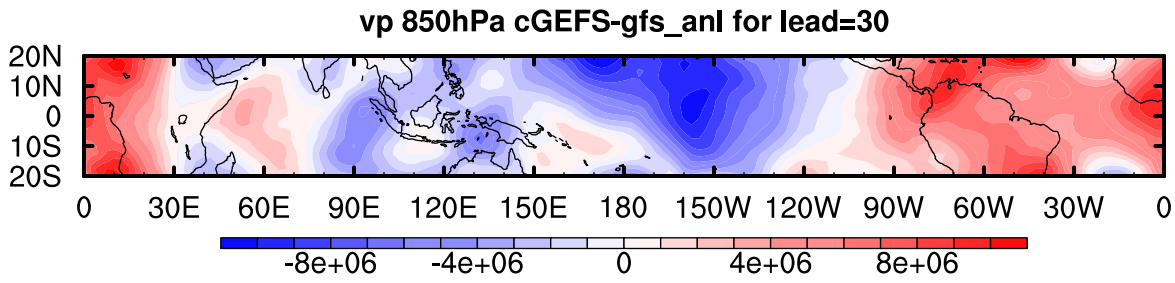
1.6e+07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-4e+06
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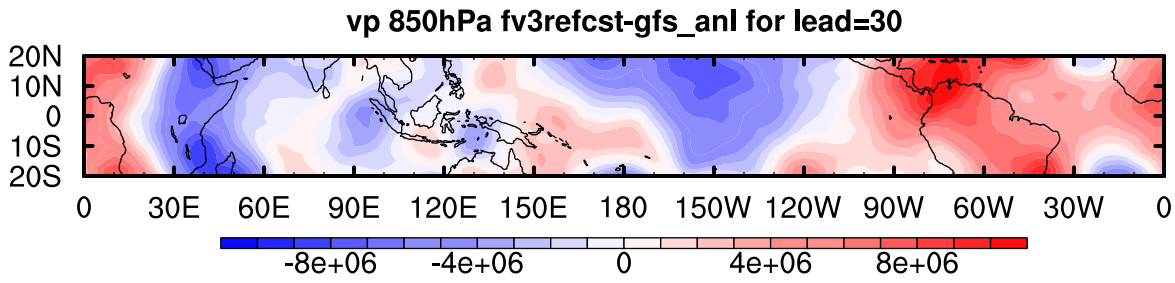
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=30
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-4e+06
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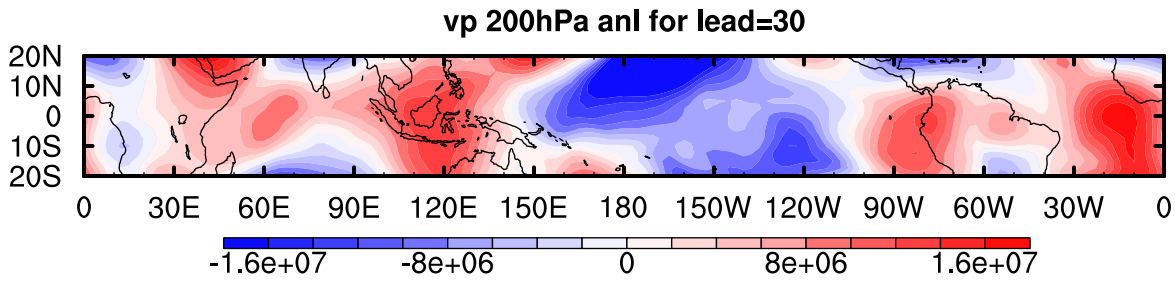
vp 200hPa anl for lead=30
20N
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10S
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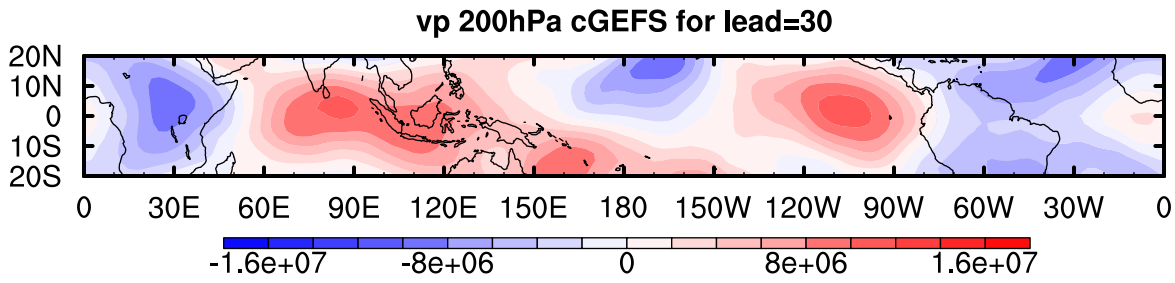
vp 200hPa cGEFS for lead=30
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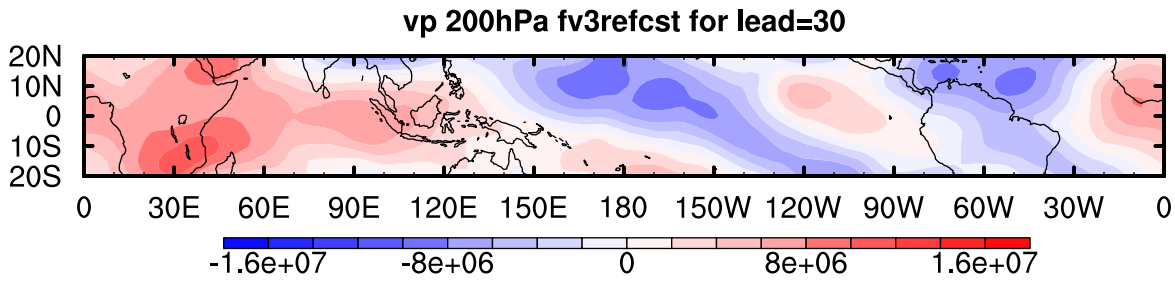
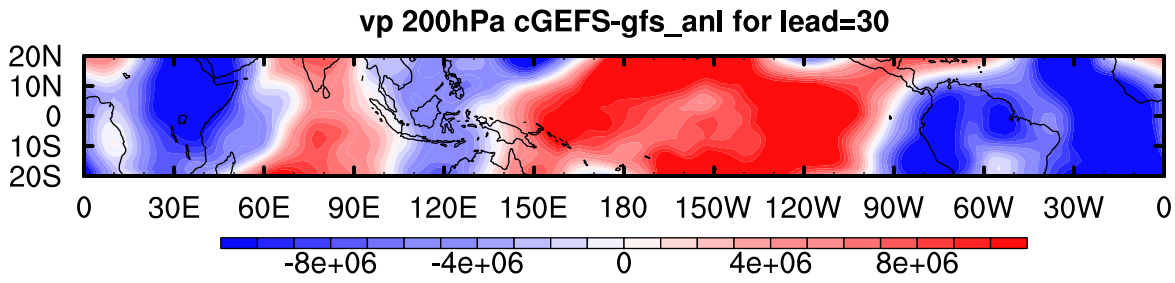
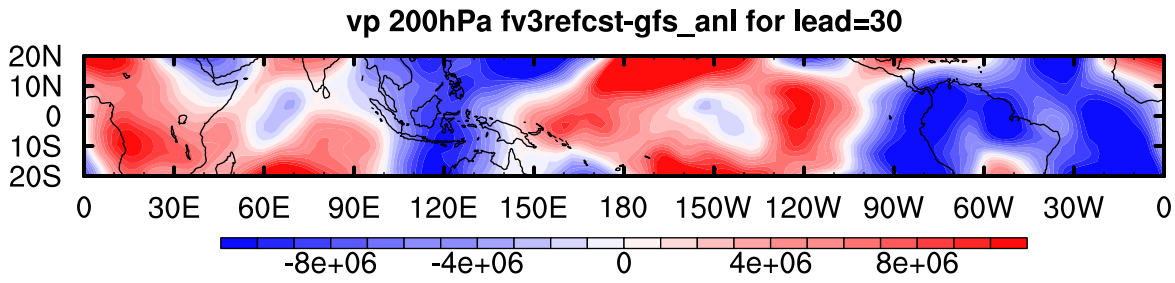
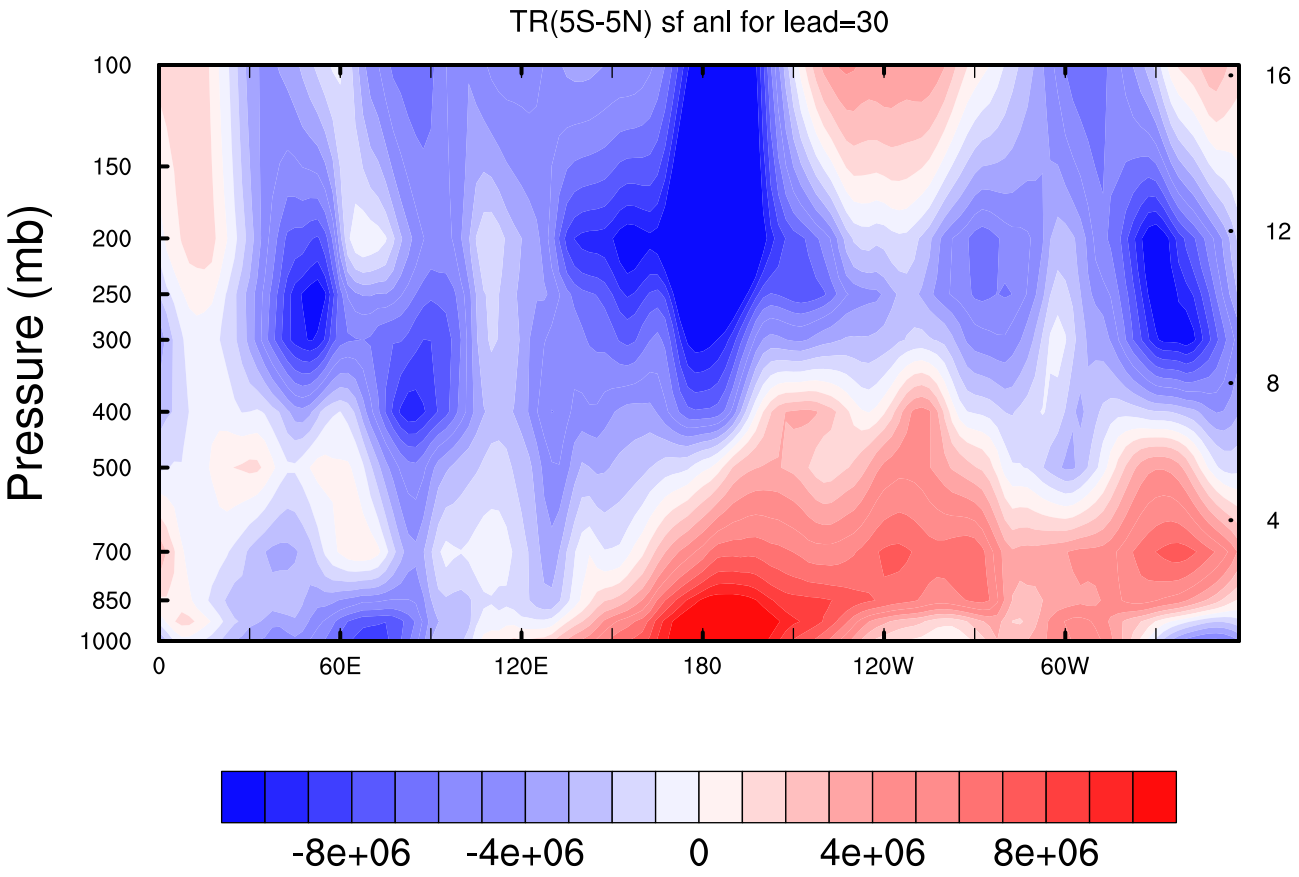
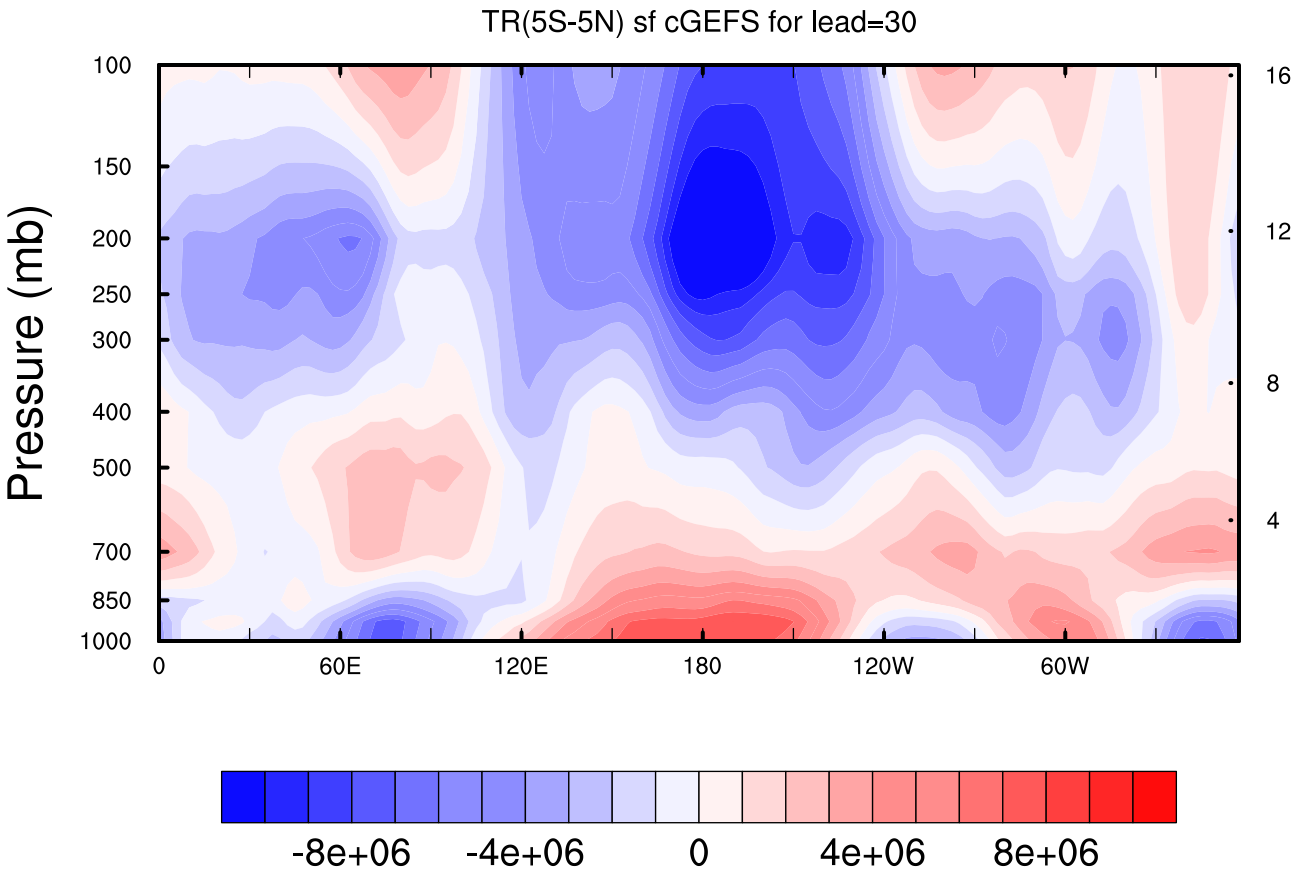
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

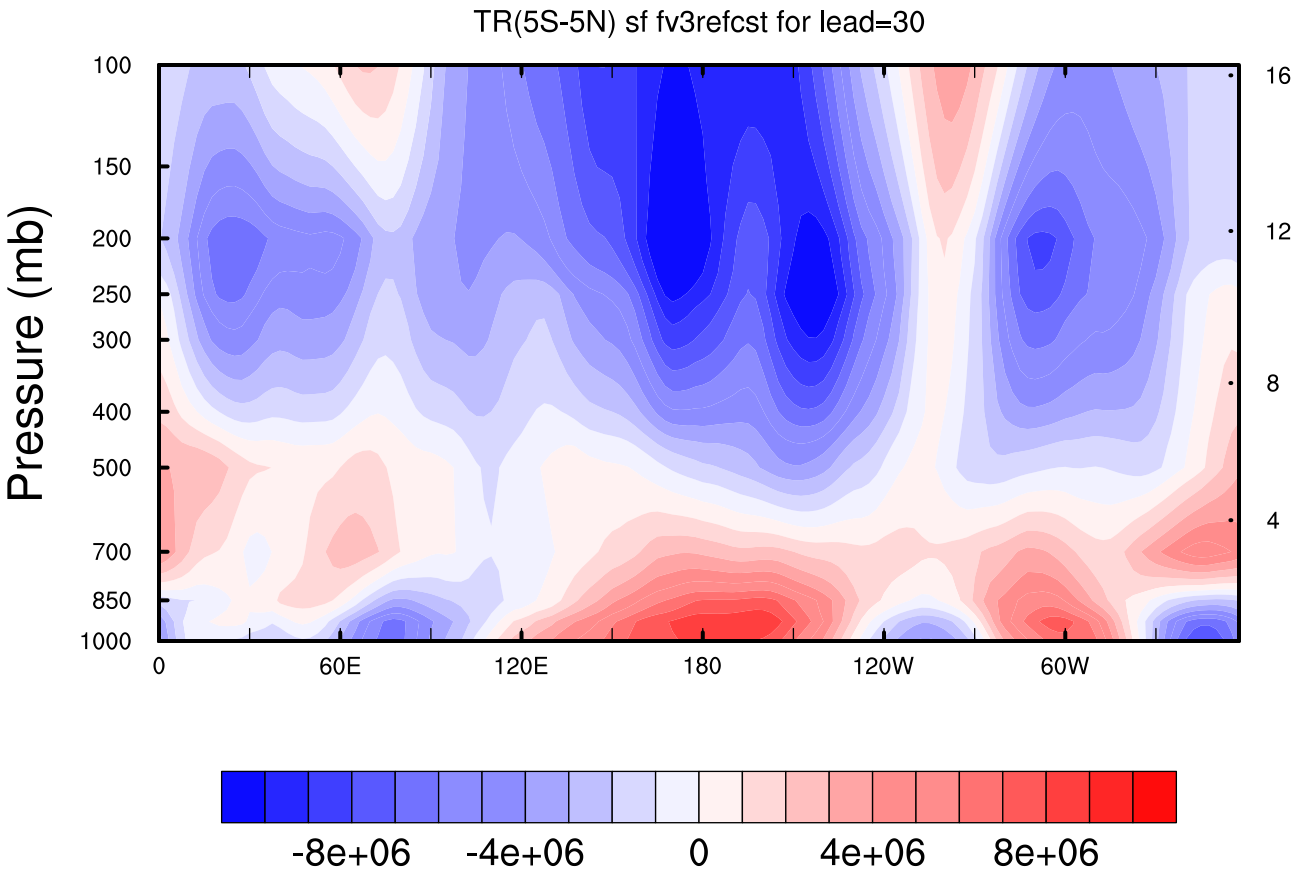

vp 200hPa fv3refcst for lead=30
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

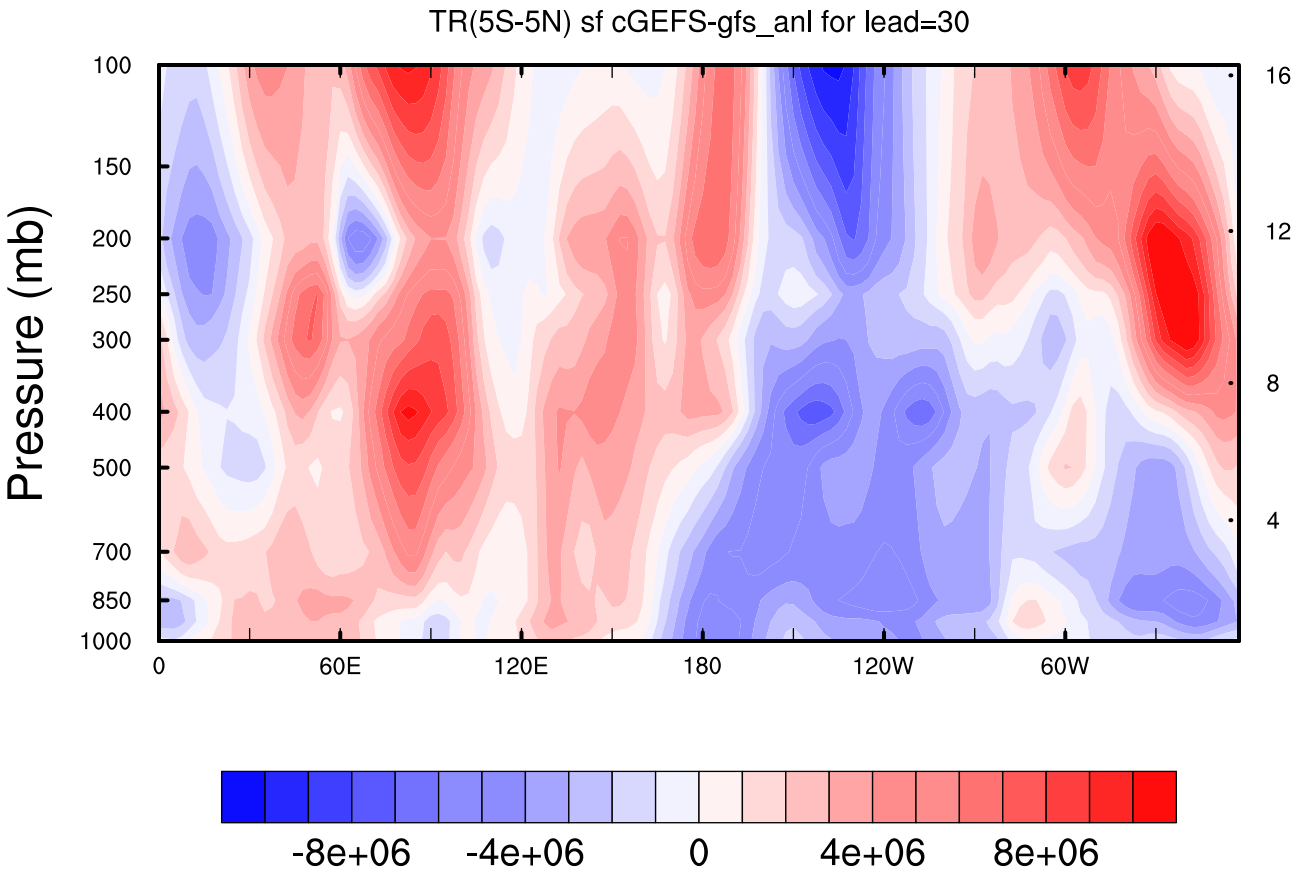

vp 200hPa cGEFS-gfs_anl for lead=30
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

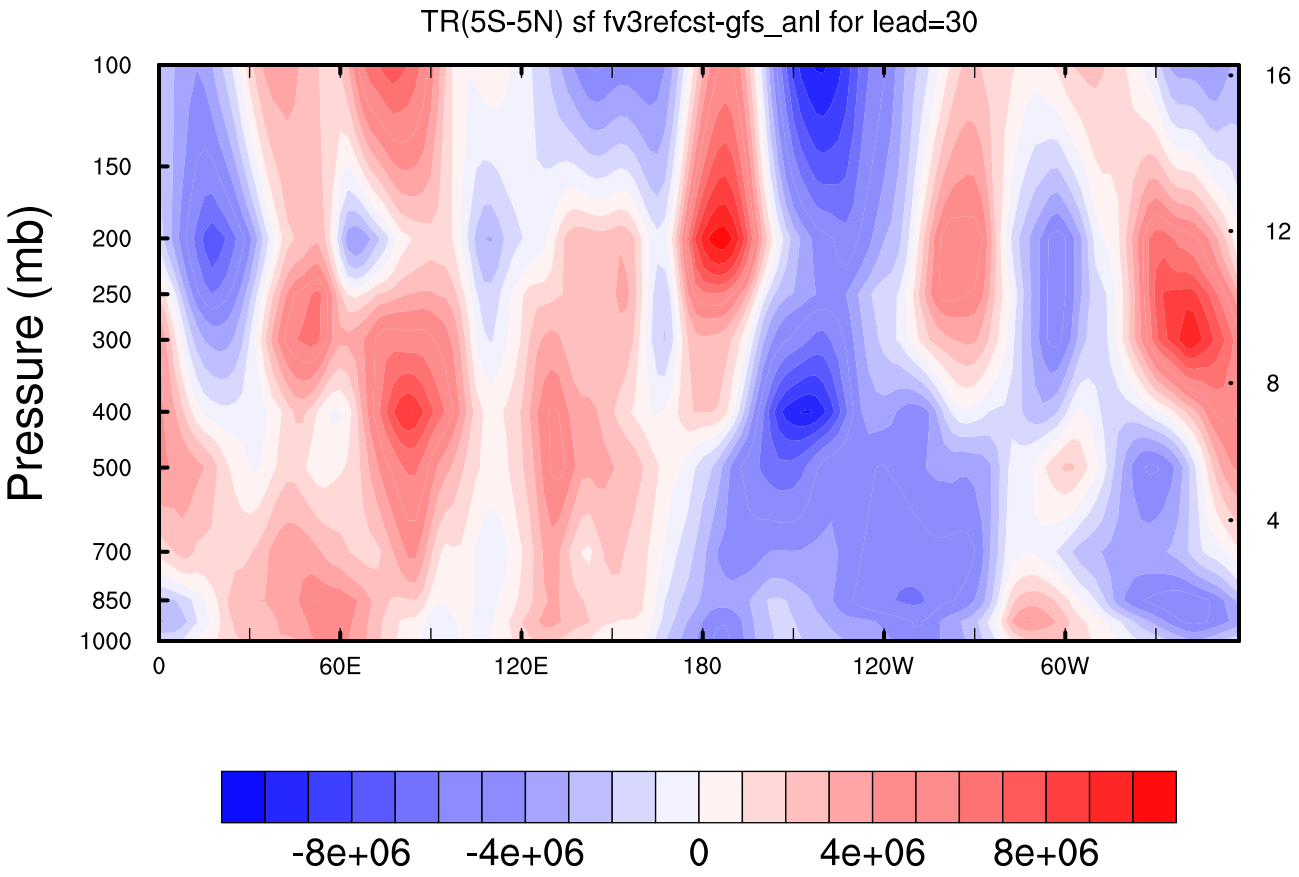

vp 200hPa fv3refcst-gfs_anl for lead=30
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

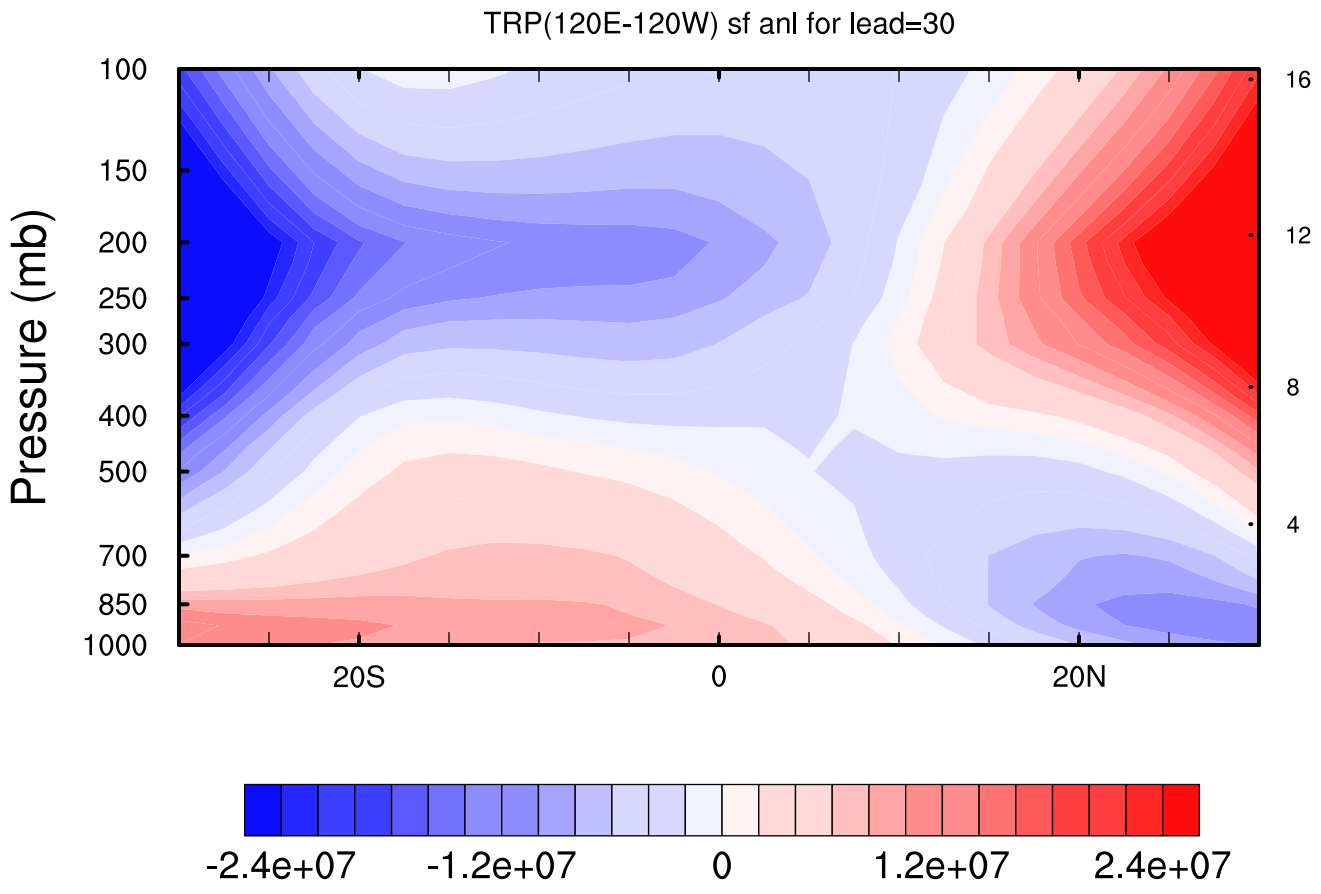

TR(5S-5N) sf anl for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

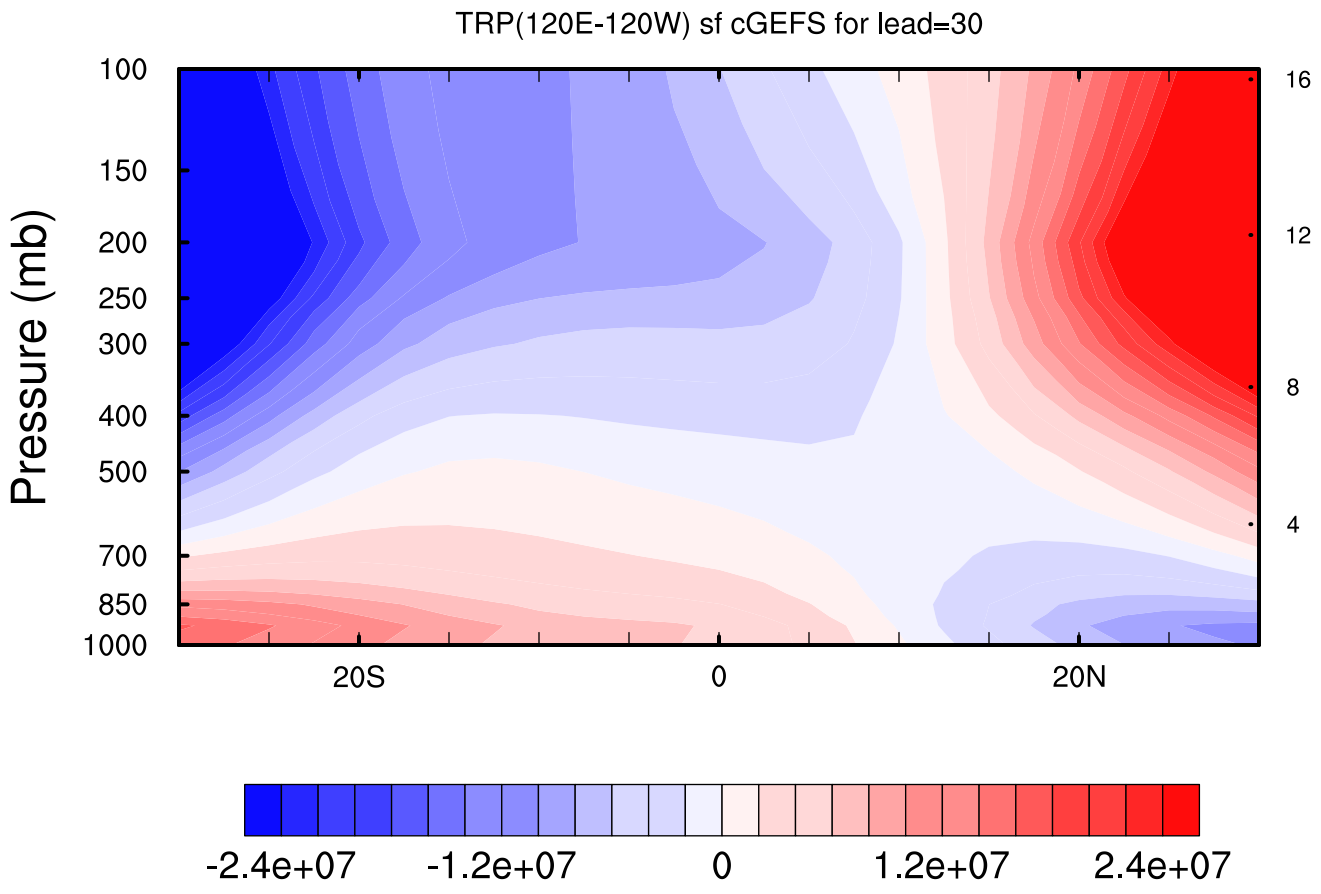

TR(5S-5N) sf cGEFS for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

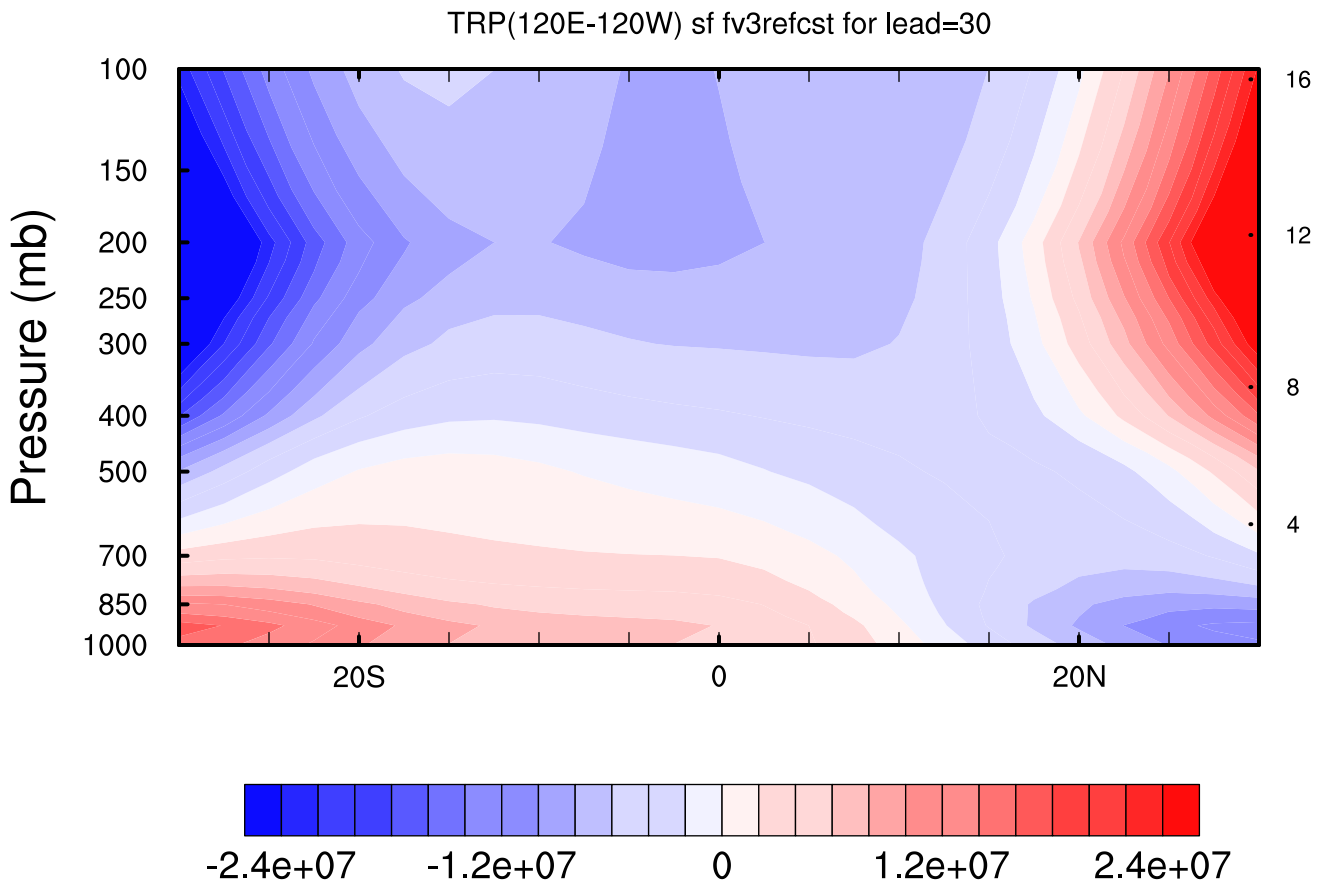

TR(5S-5N) sf fv3refcst for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

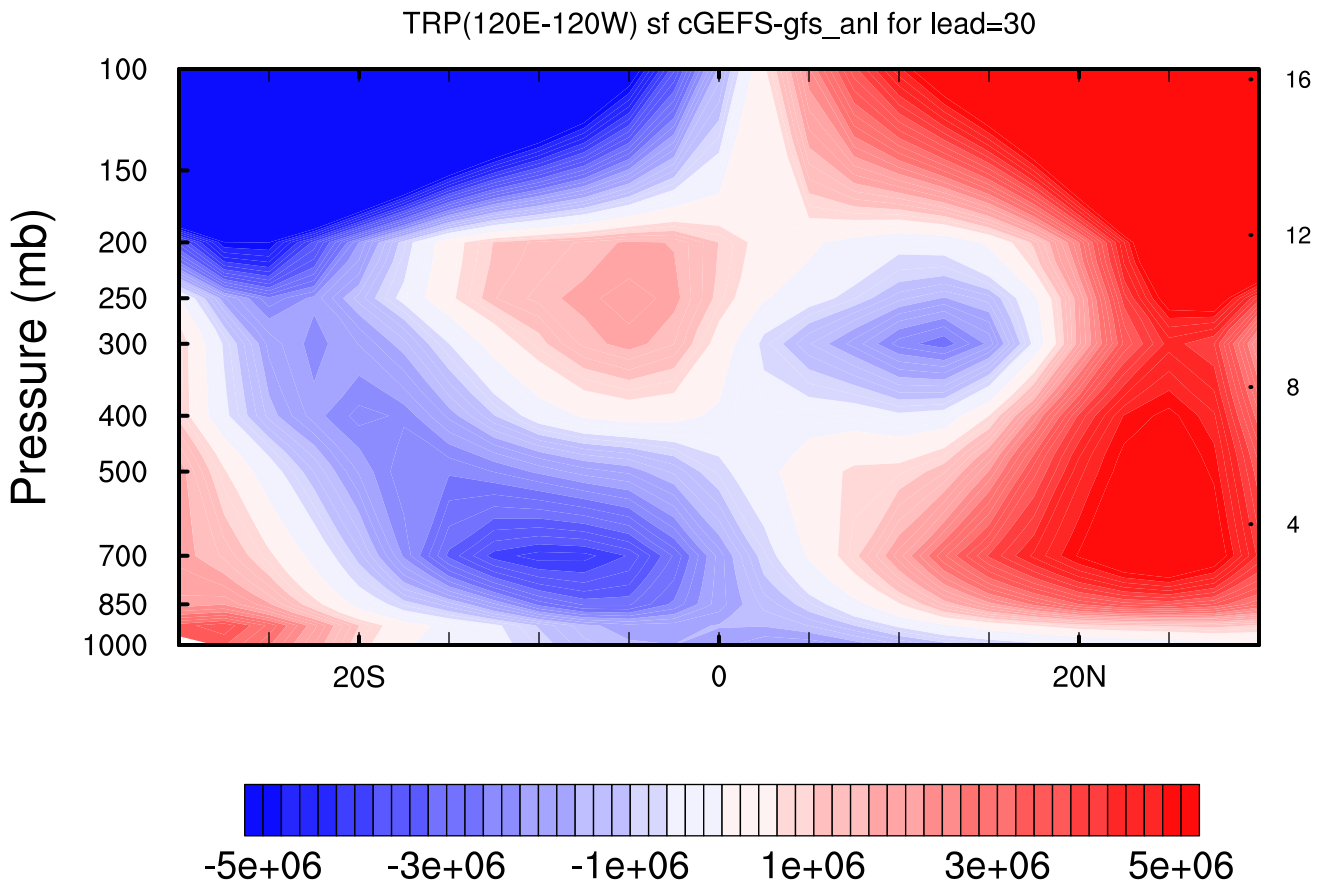

TR(5S-5N) sf cGEFS-gfs_anl for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

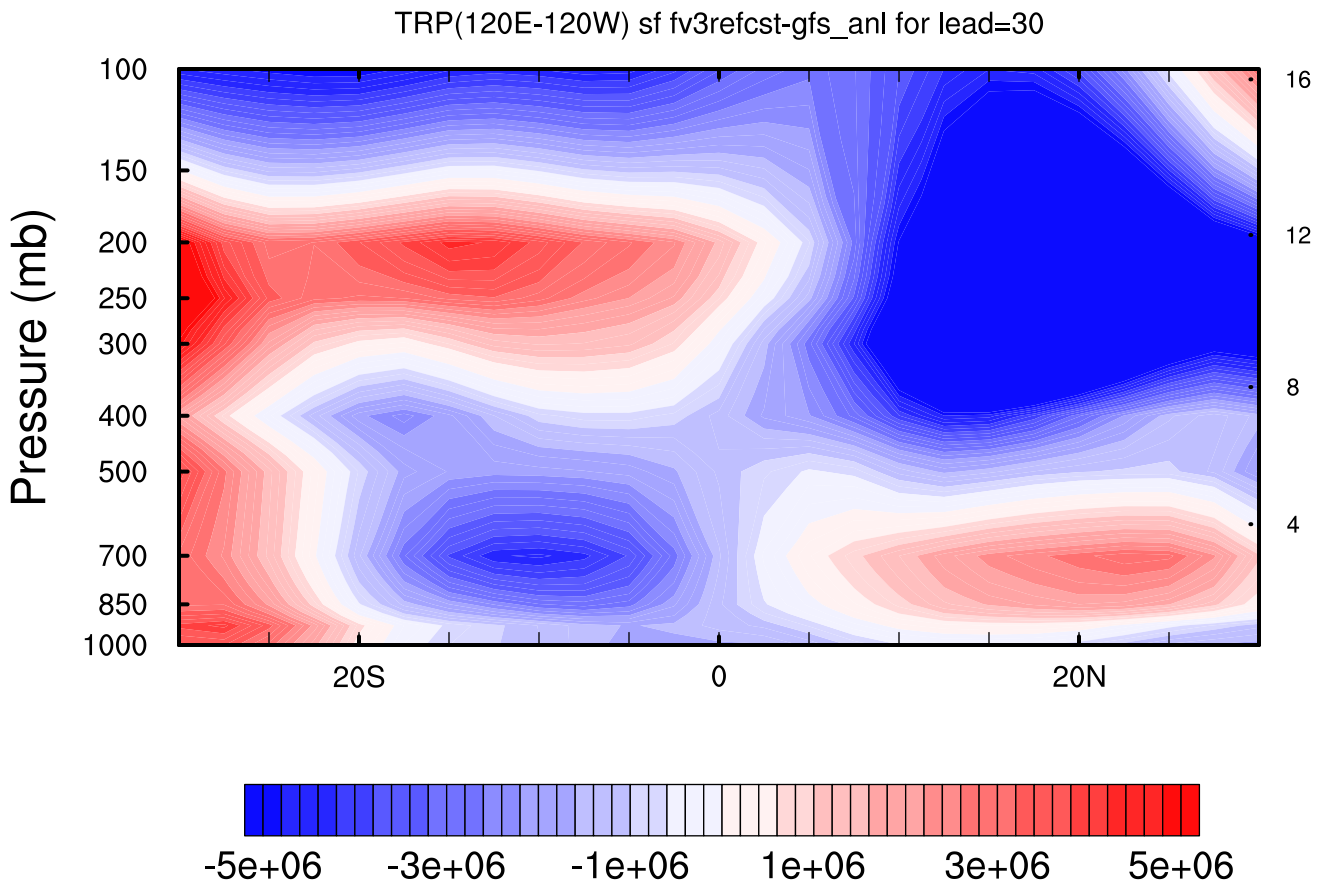

TR(5S-5N) sf fv3refcst-gfs_anl for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

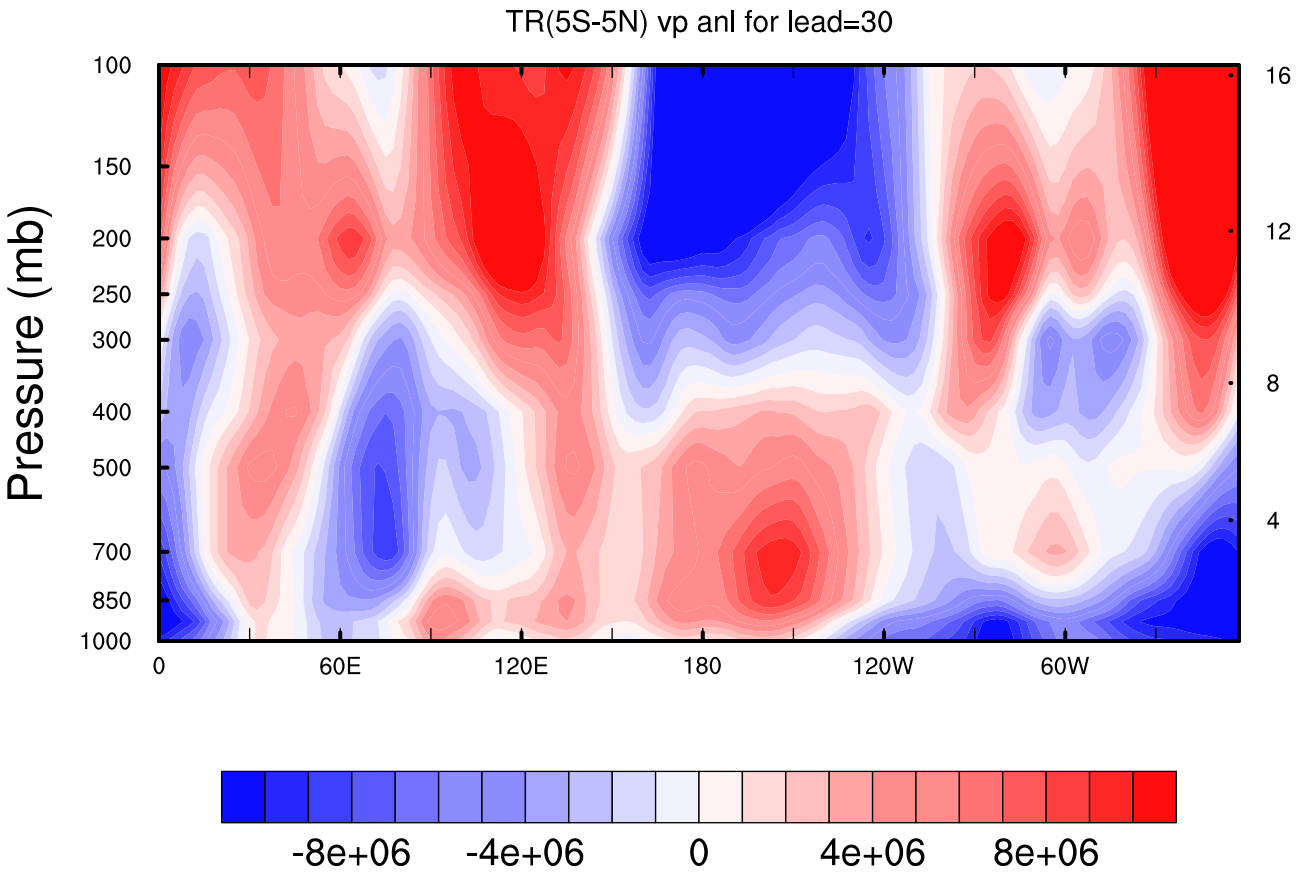

TRP(120E-120W) sf anl for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

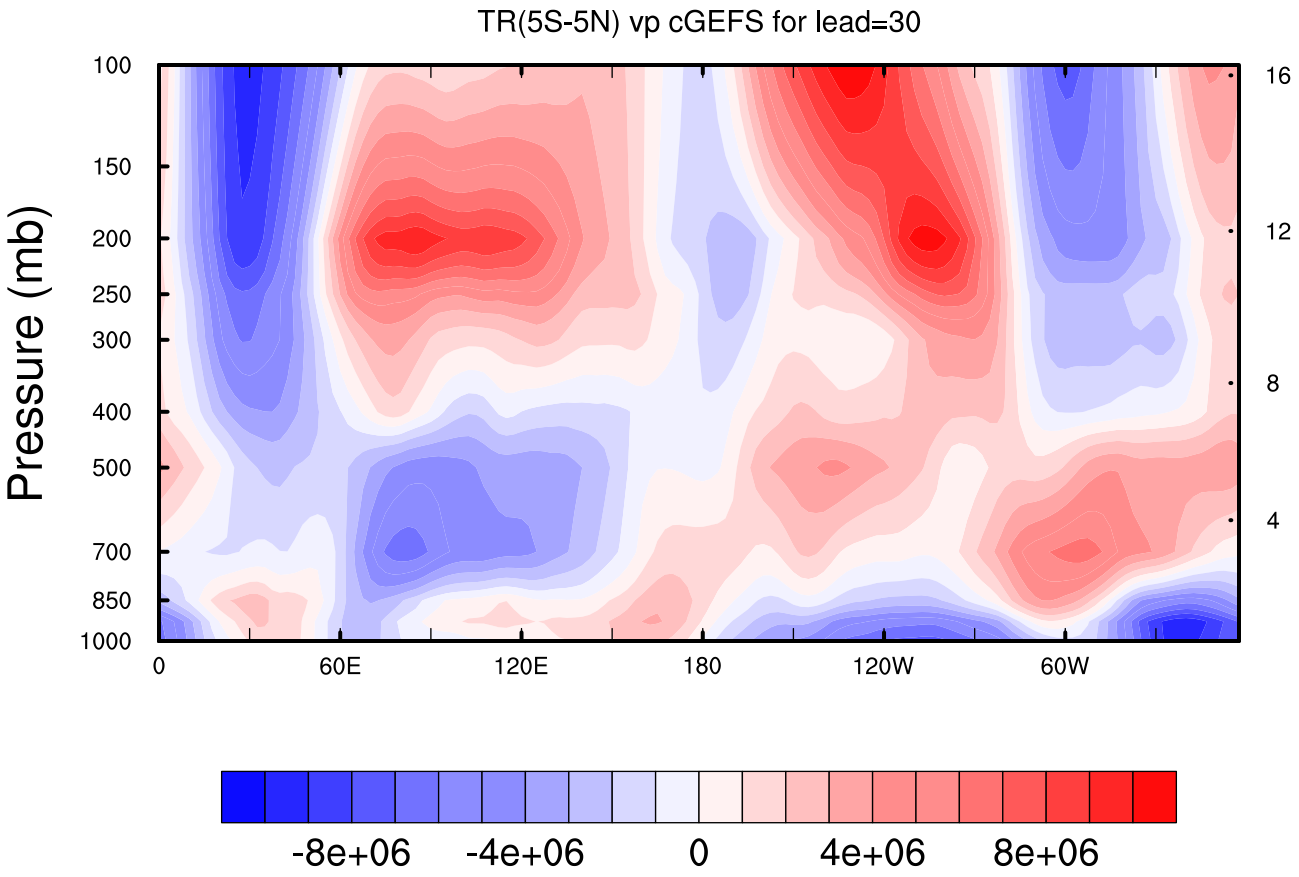

TRP(120E-120W) sf cGEFS for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

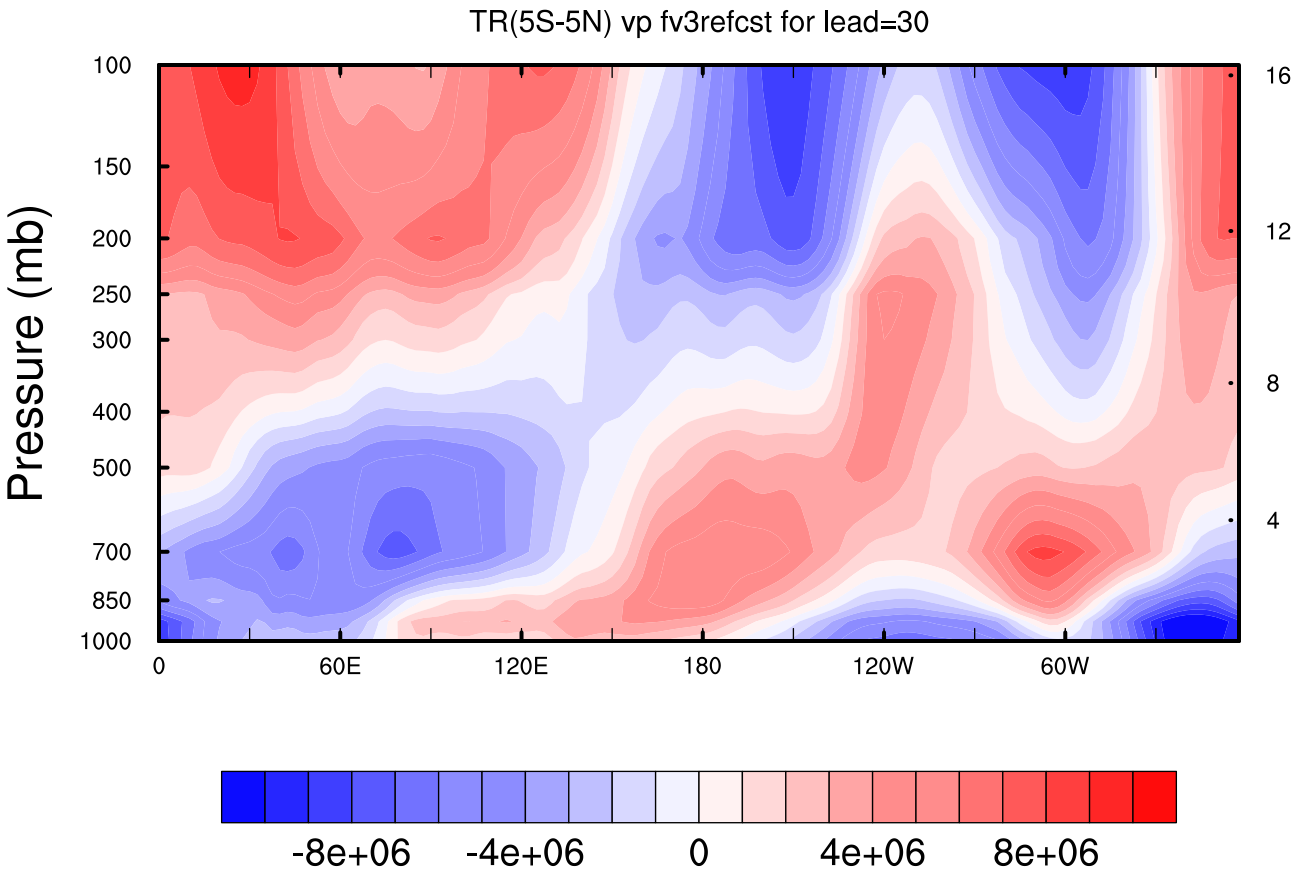

TRP(120E-120W) sf fv3refcst for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

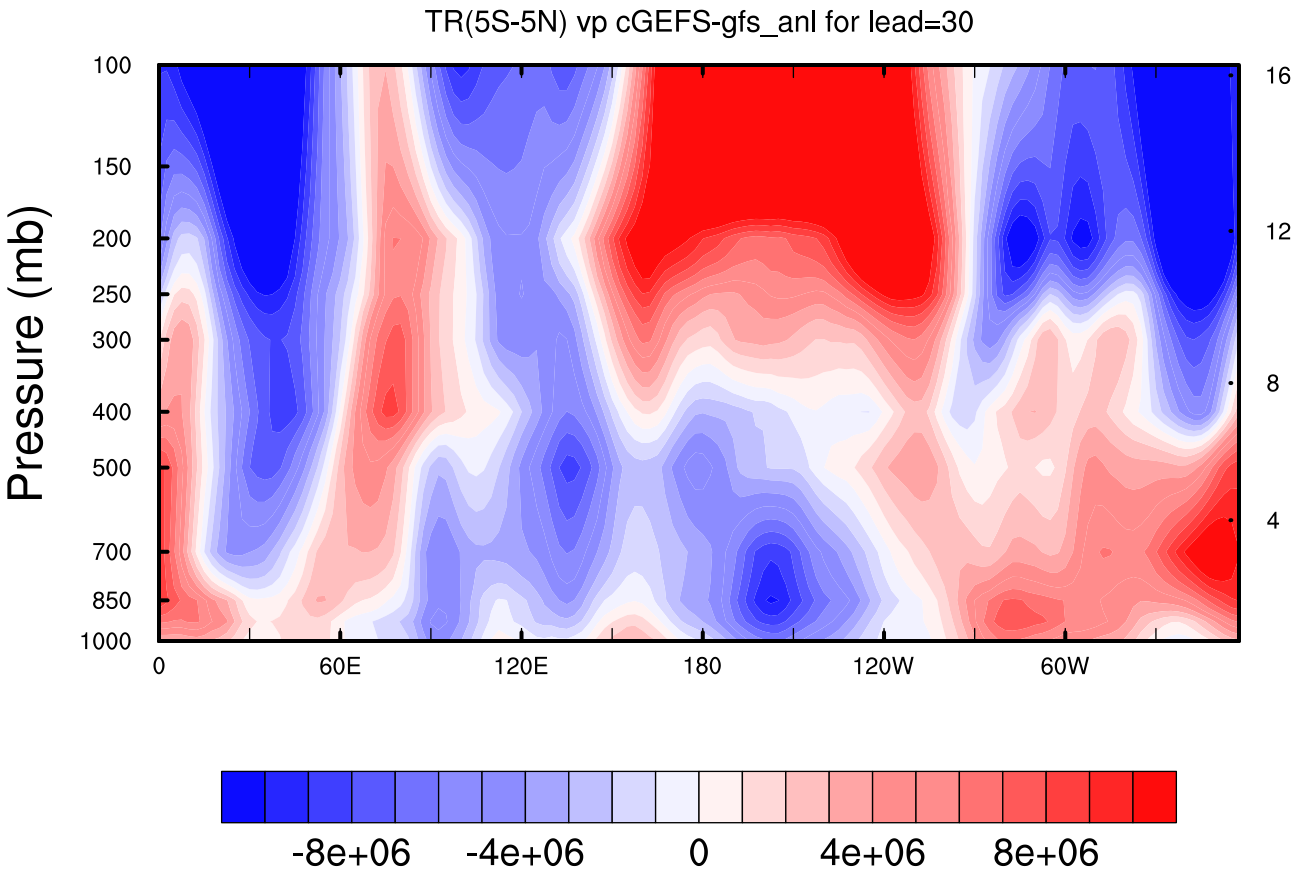

TRP(120E-120W) sf cGEFS-gfs_anl for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

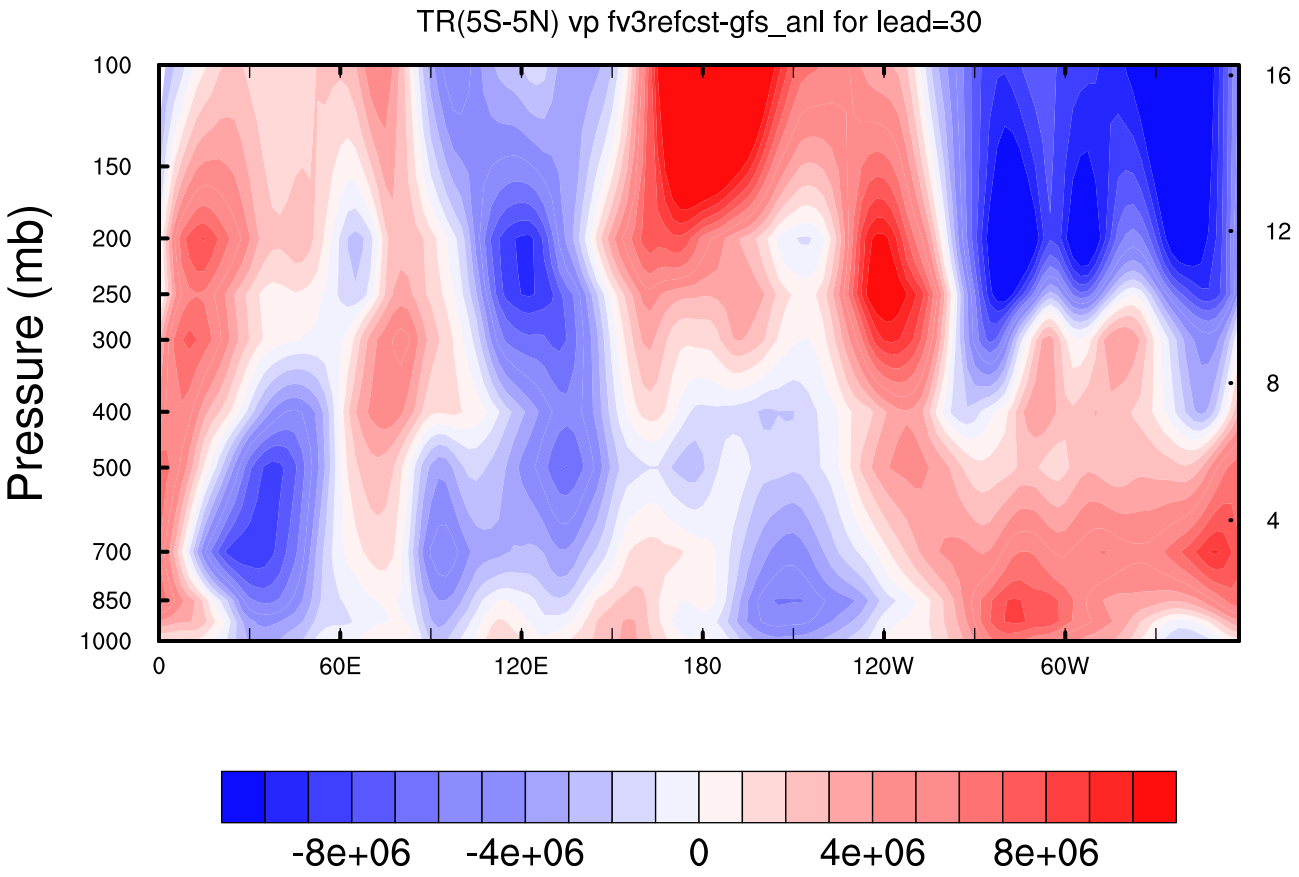

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

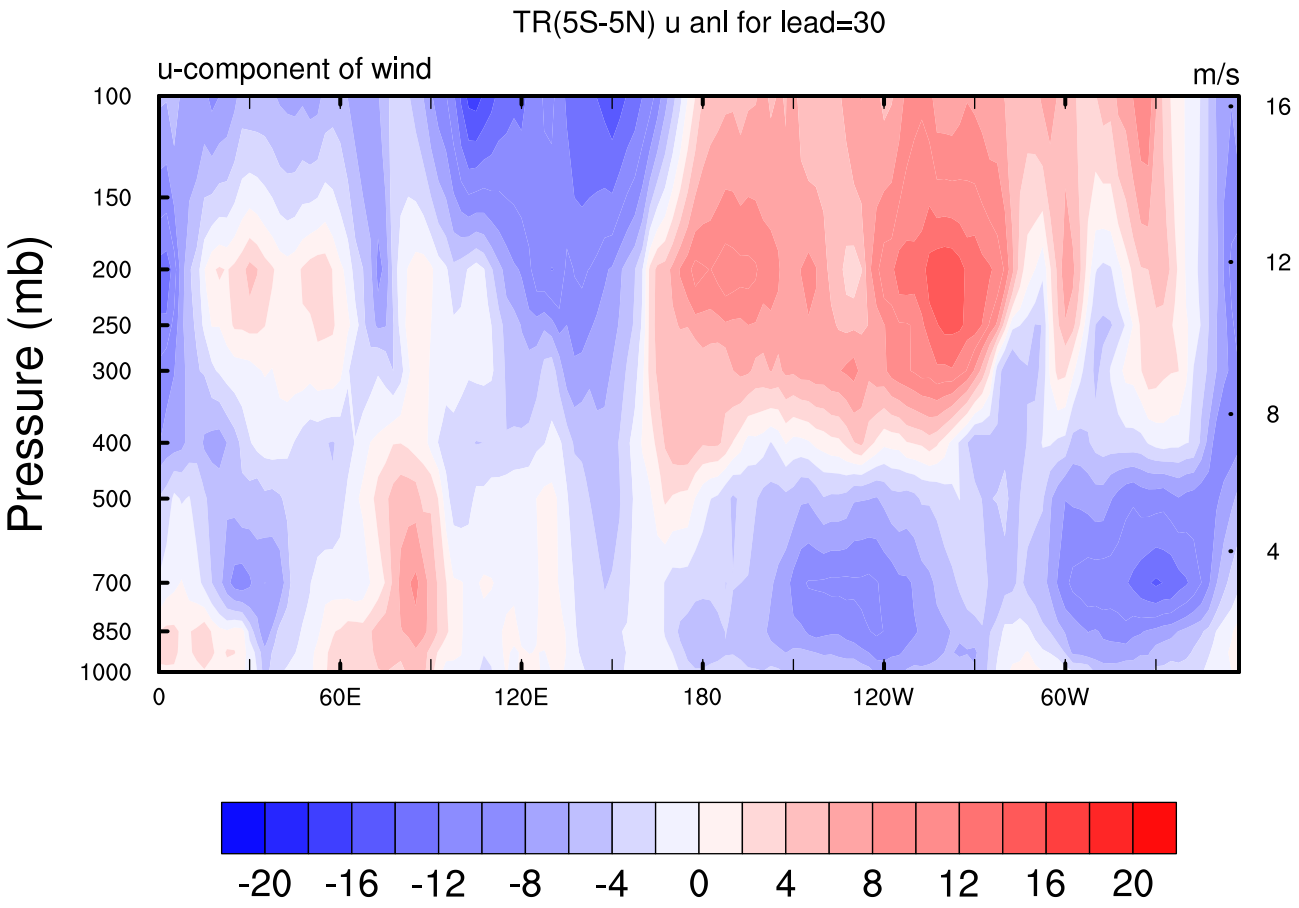

TR(5S-5N) vp anl for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

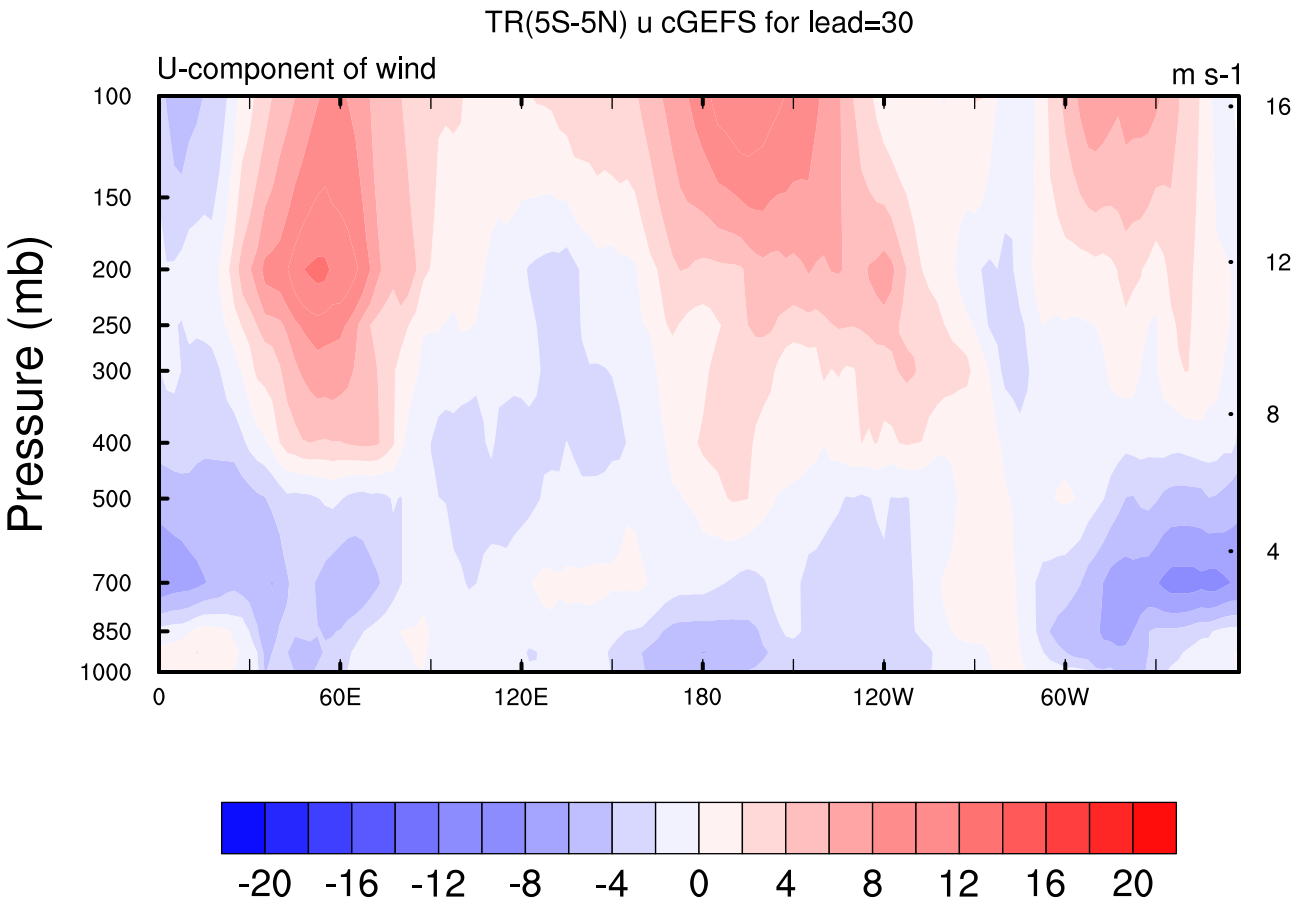

TR(5S-5N) vp cGEFS for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

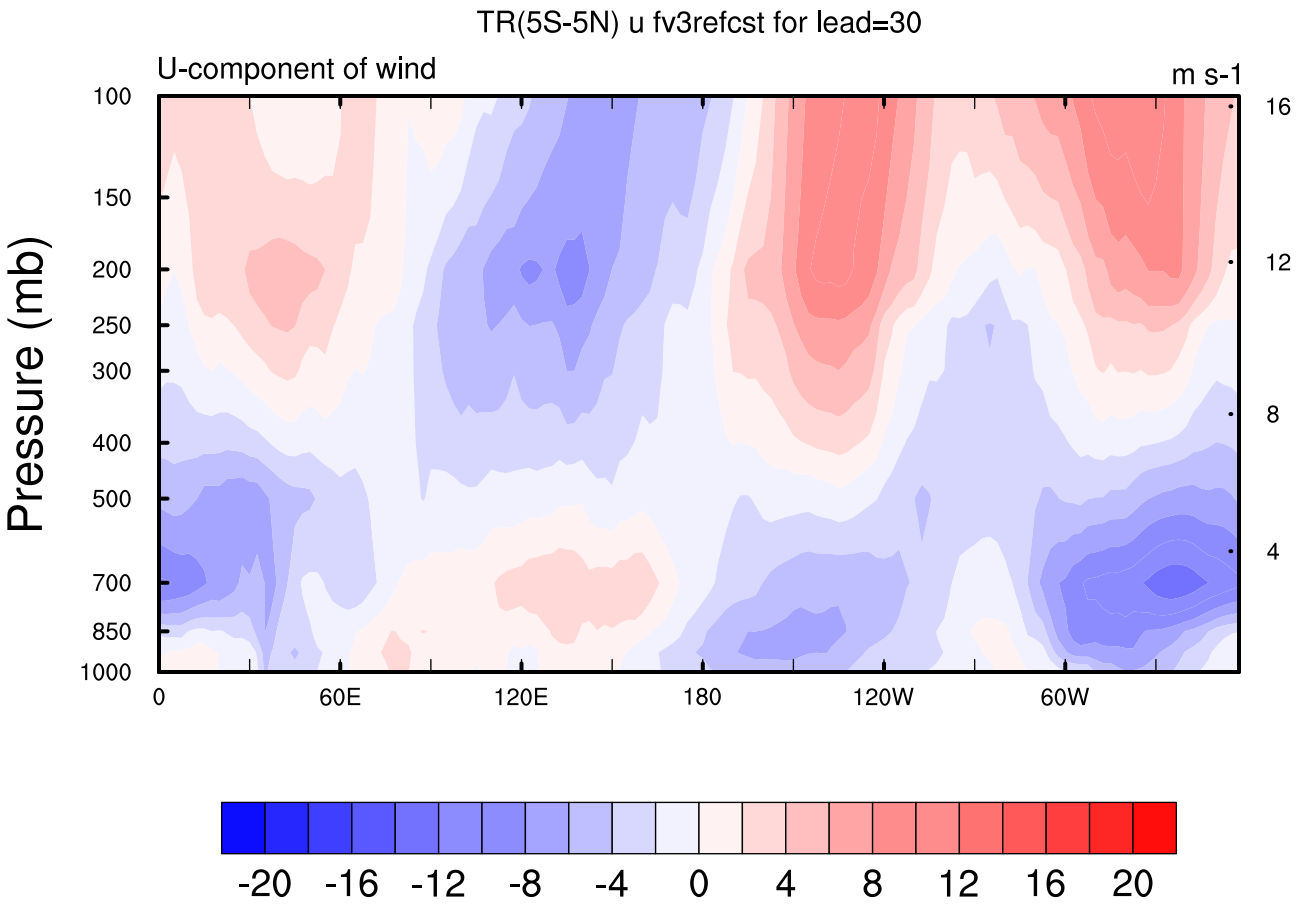

TR(5S-5N) vp fv3refcst for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

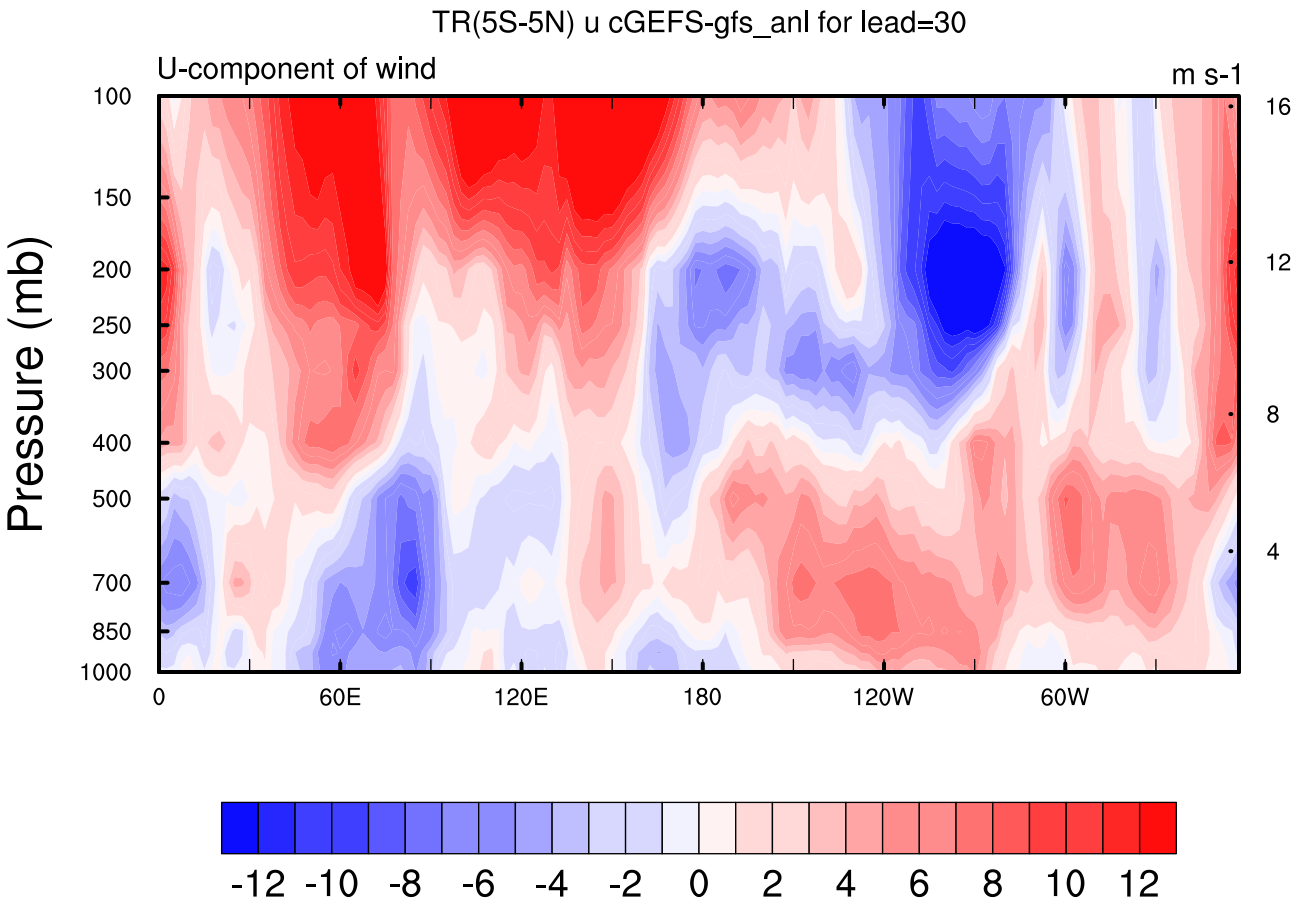

TR(5S-5N) vp cGEFS-gfs_anl for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

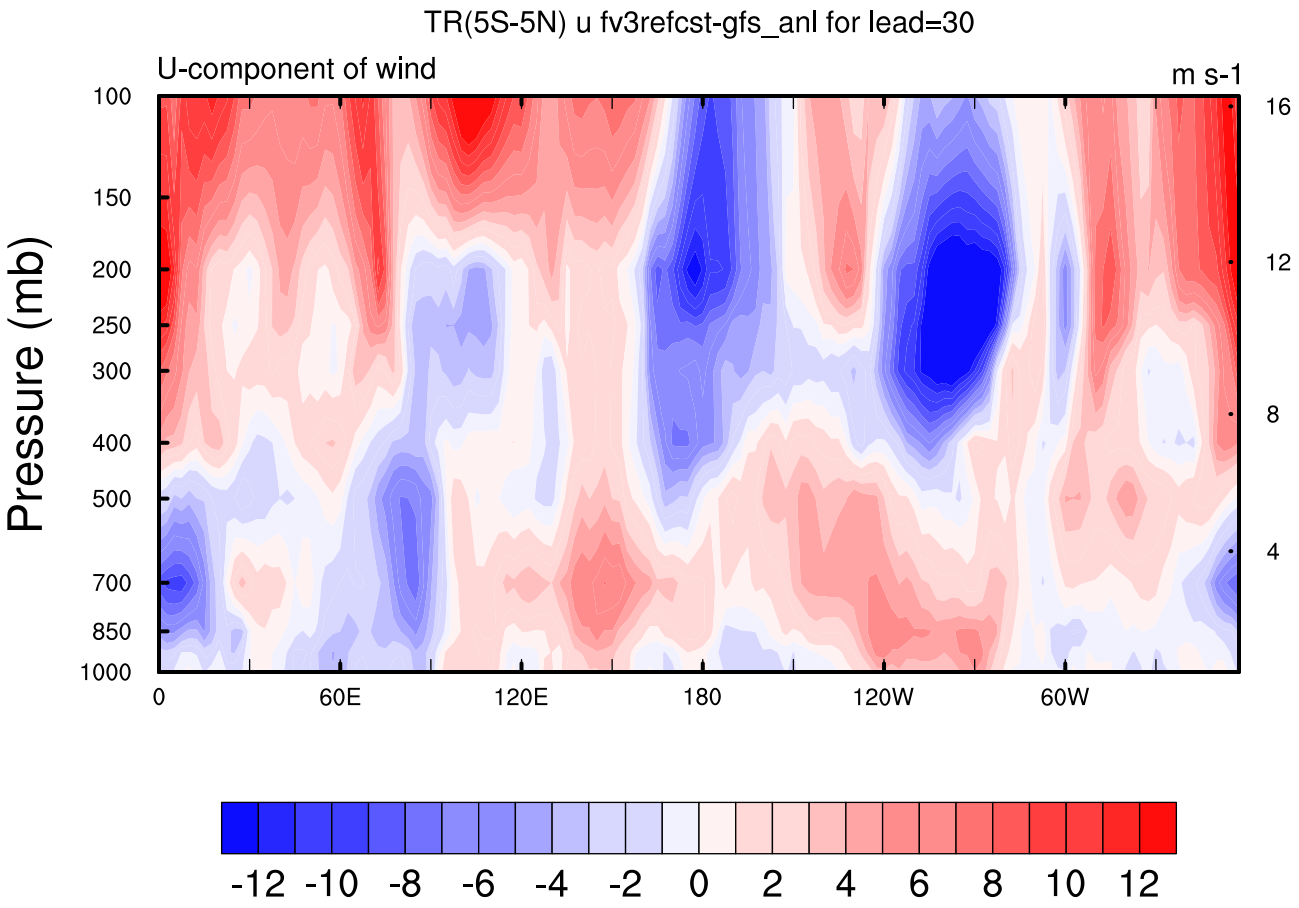

TR(5S-5N) vp fv3refcst-gfs_anl for lead=30
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

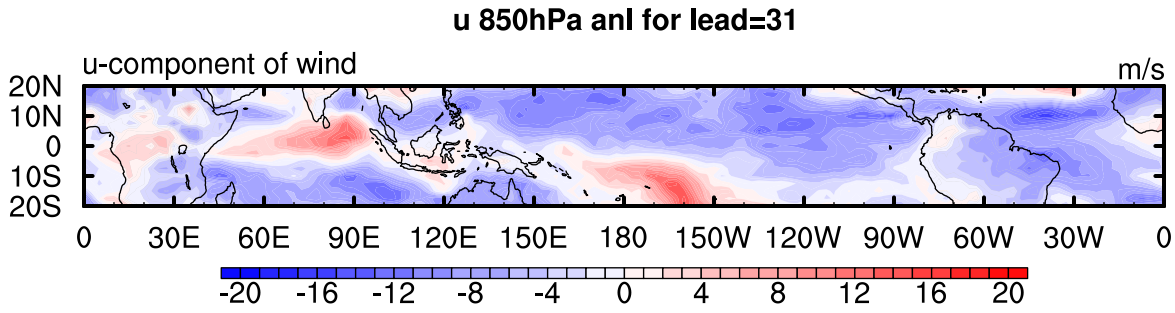

TR(5S-5N) u anl for lead=30
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

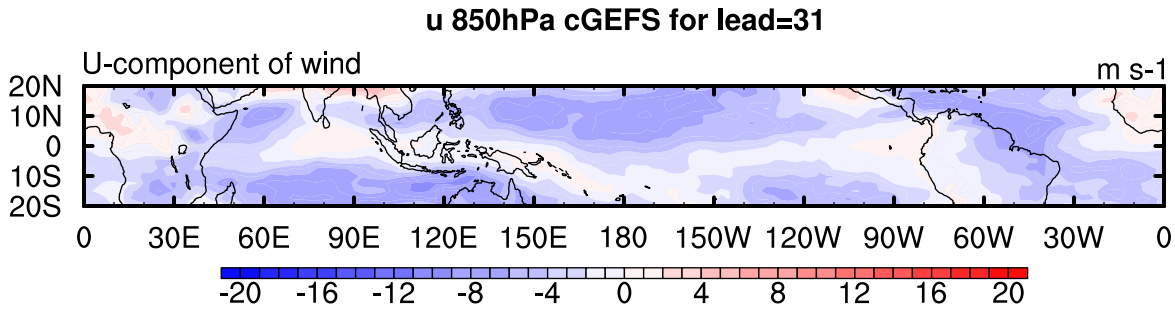

TR(5S-5N) u cGEFS for lead=30
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

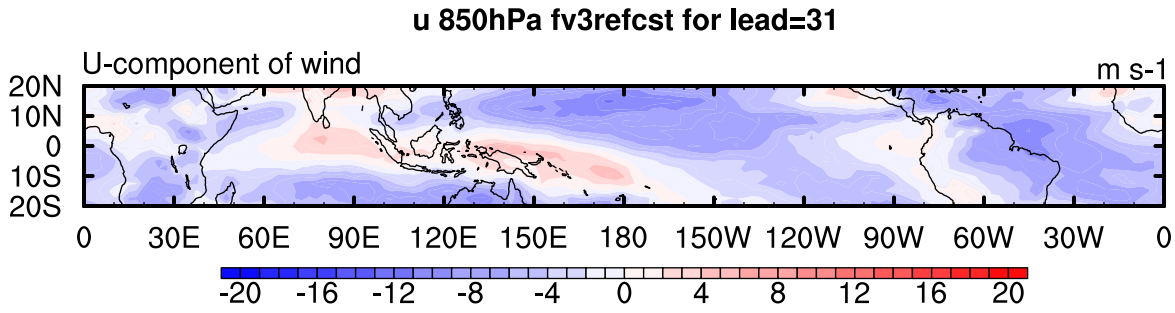

TR(5S-5N) u fv3refcst for lead=30
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

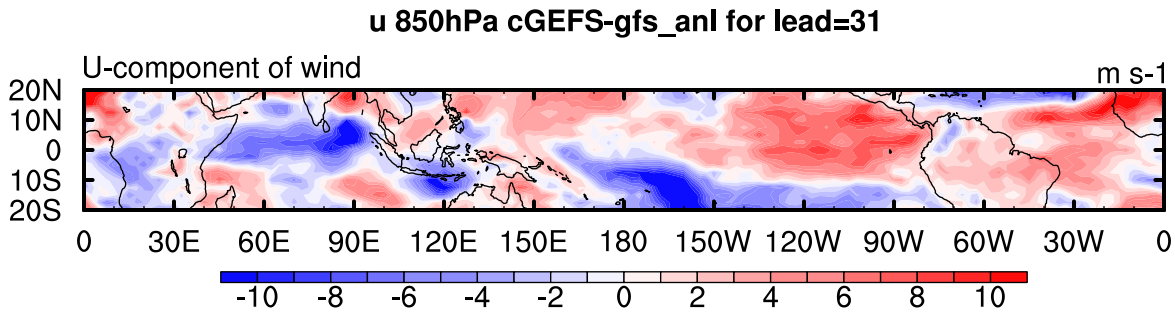

TR(5S-5N) u cGEFS-gfs_anl for lead=30
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

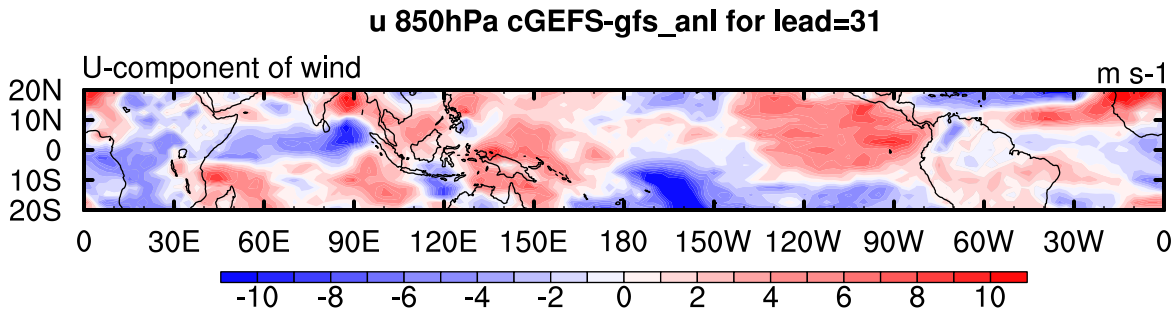

TR(5S-5N) u fv3refcst-gfs_anl for lead=30
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

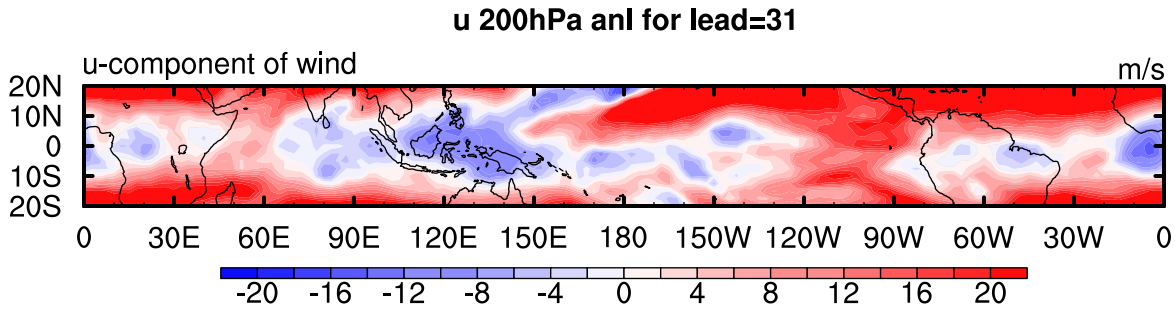

u 850hPa anl for lead=31
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

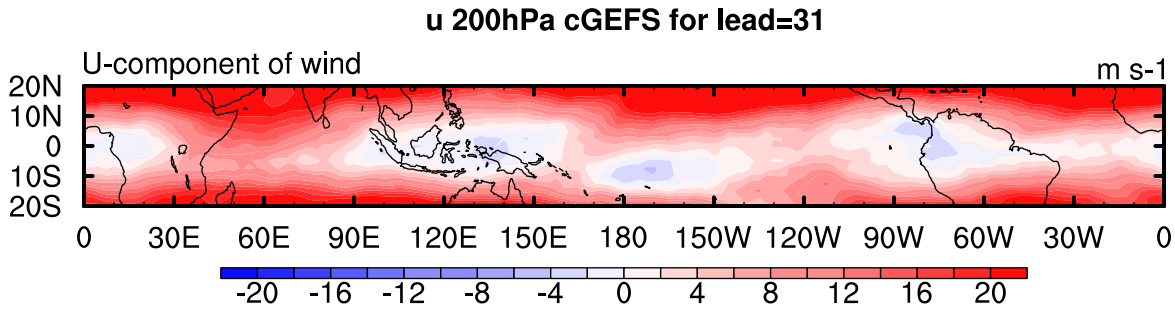

u 850hPa cGEFS for lead=31
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

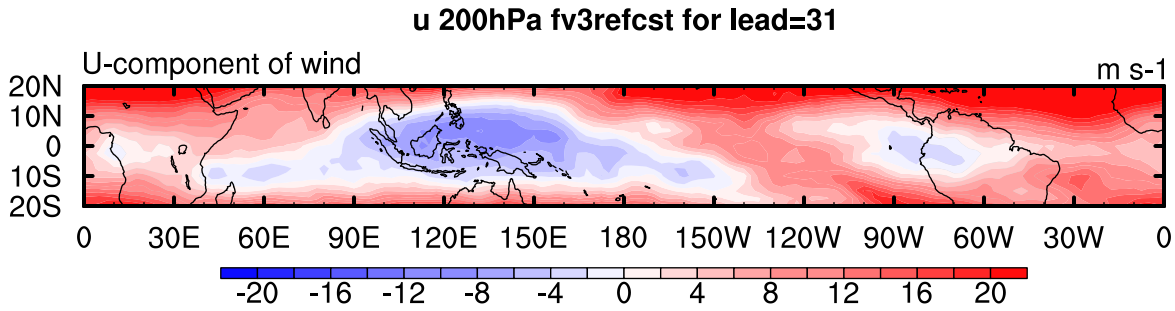

u 850hPa fv3refcst for lead=31
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

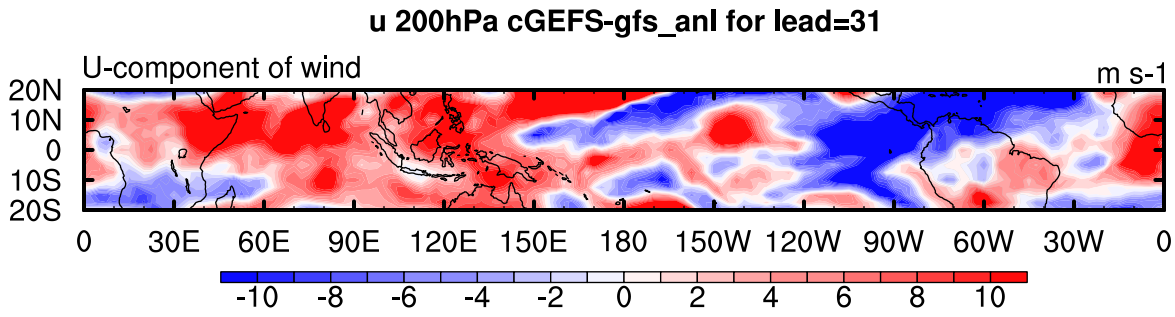

u 850hPa cGEFS-gfs_anl for lead=31
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

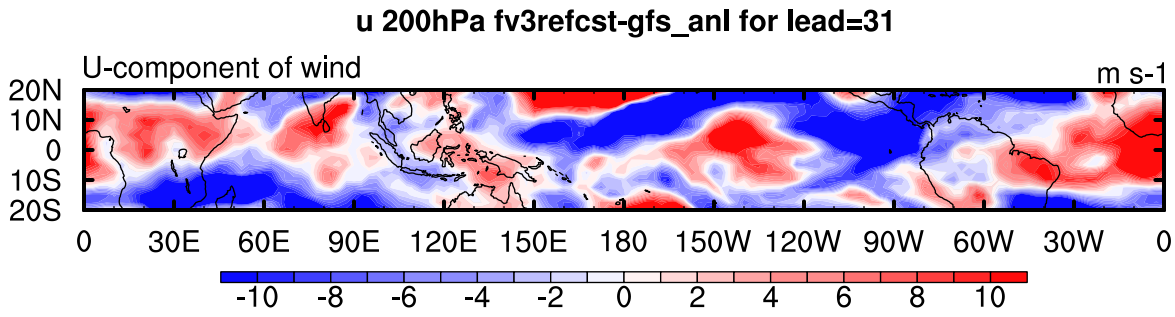

u 850hPa cGEFS-gfs_anl for lead=31
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

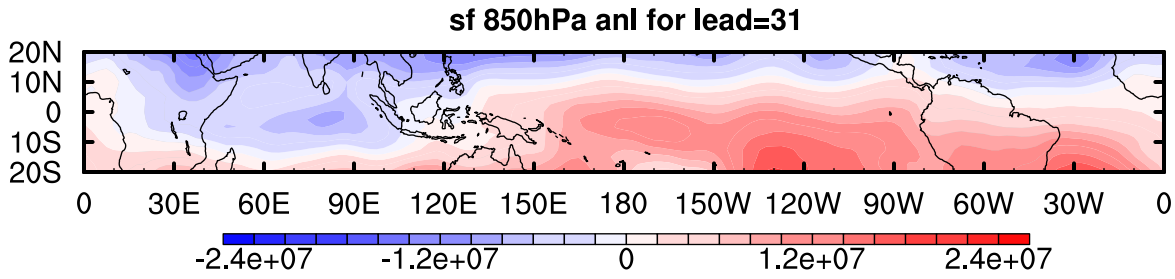

u 200hPa anl for lead=31
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

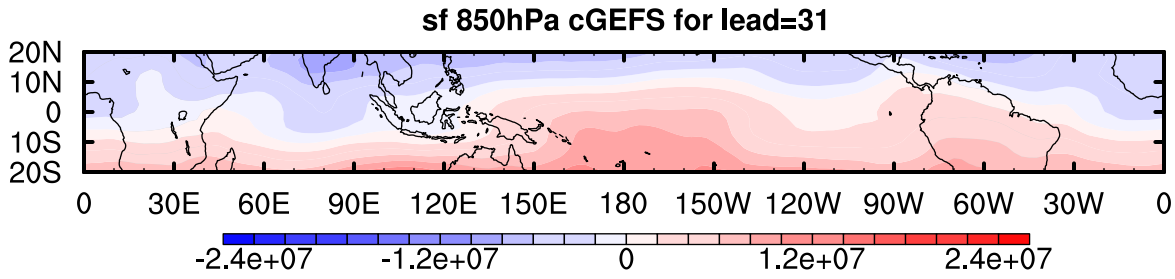

u 200hPa cGEFS for lead=31
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

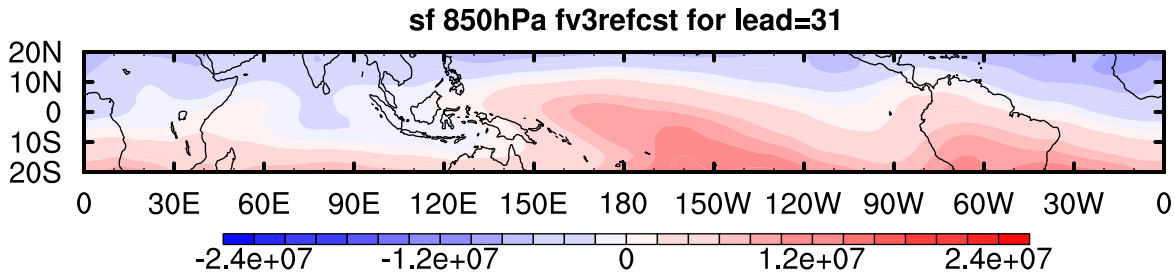

u 200hPa fv3refcst for lead=31
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

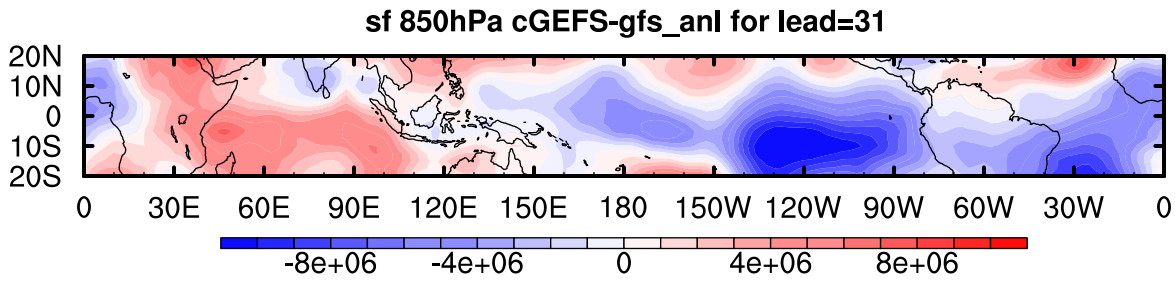

u 200hPa cGEFS-gfs_anl for lead=31
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

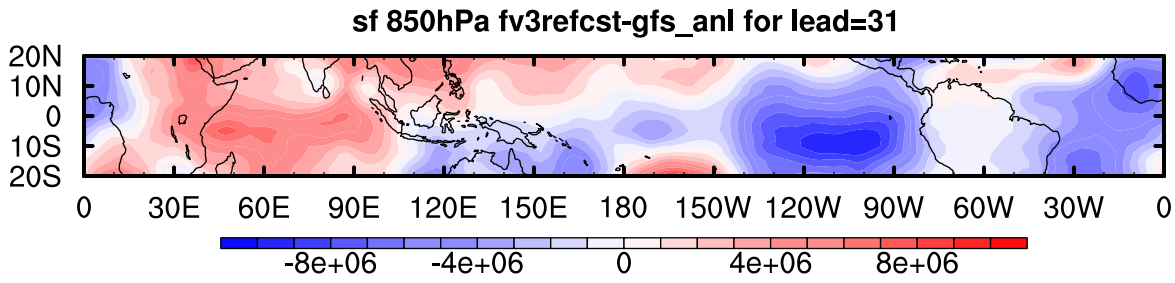

u 200hPa fv3refcst-gfs_anl for lead=31
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

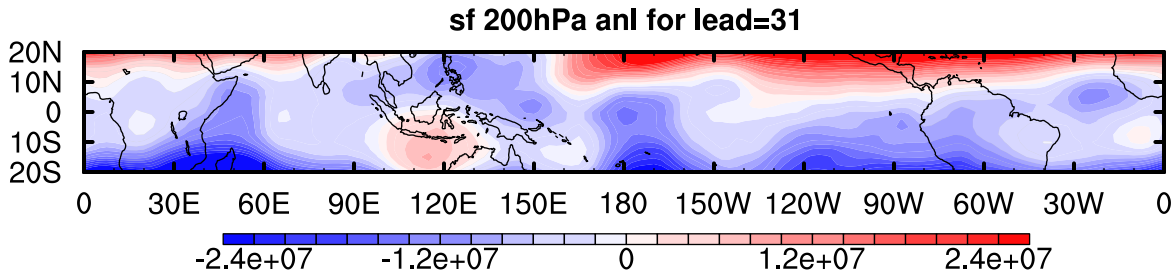

sf 850hPa anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

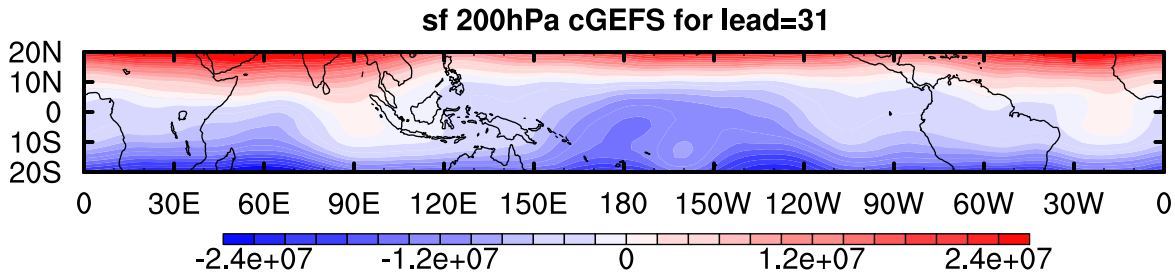

sf 850hPa cGEFS for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

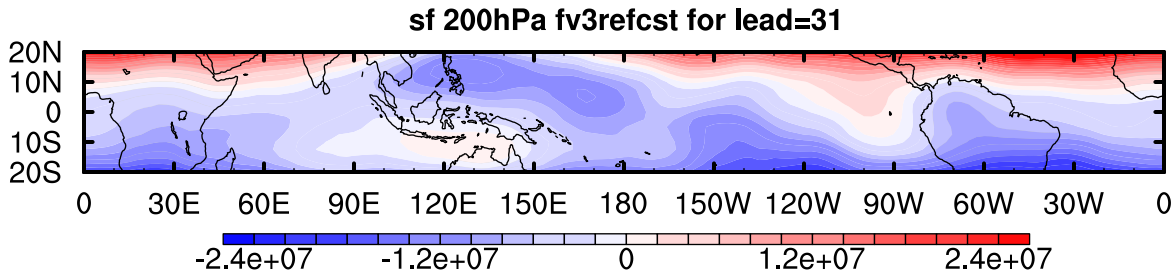

sf 850hPa fv3refcst for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

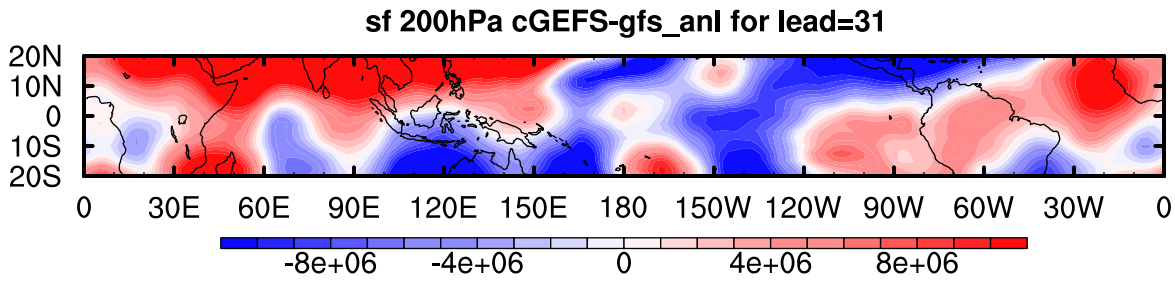

sf 850hPa cGEFS-gfs_anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

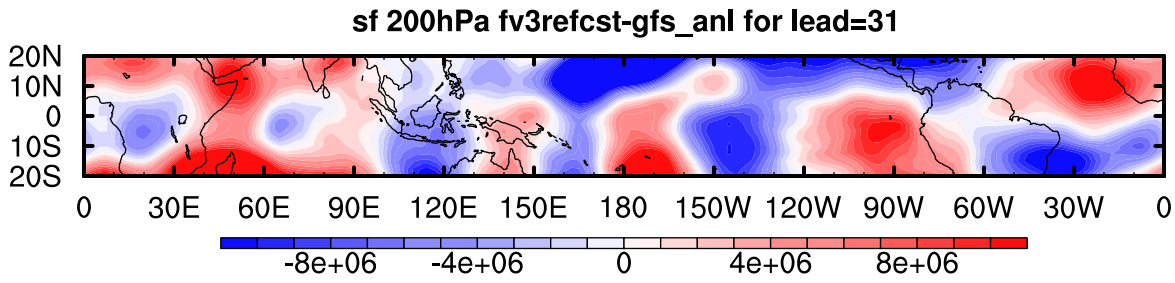

sf 850hPa fv3refcst-gfs_anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

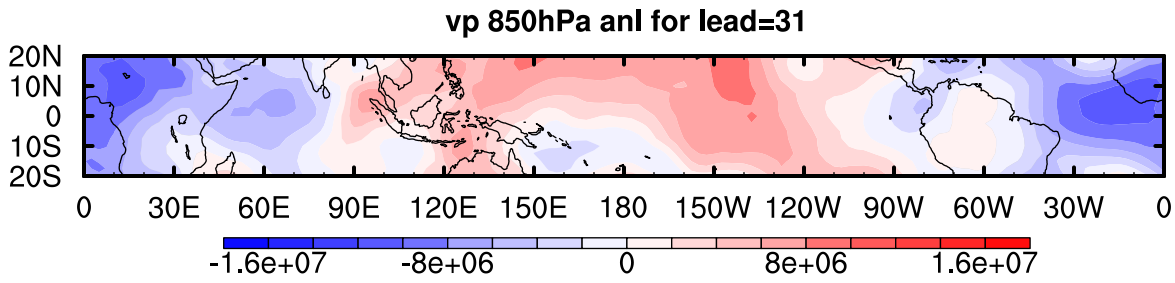

sf 200hPa anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

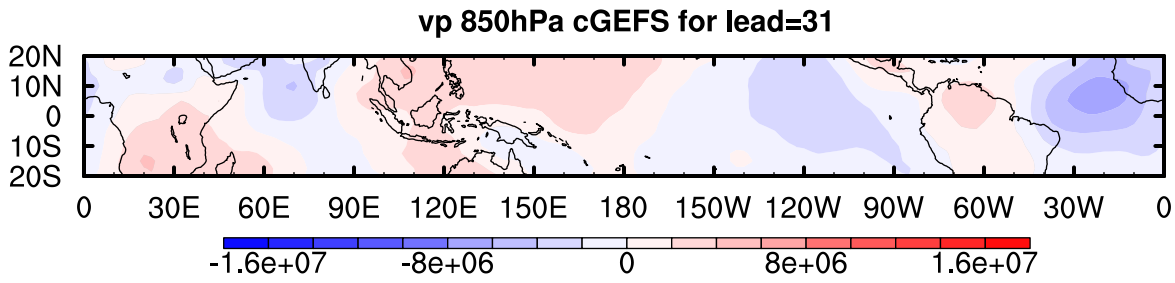

sf 200hPa cGEFS for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

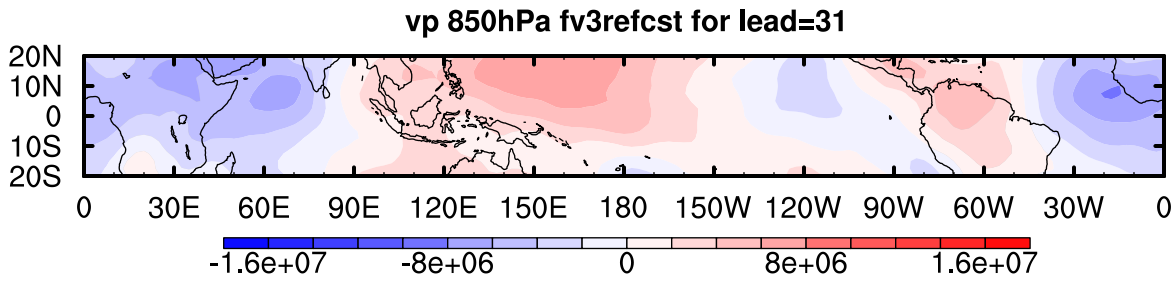

sf 200hPa fv3refcst for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

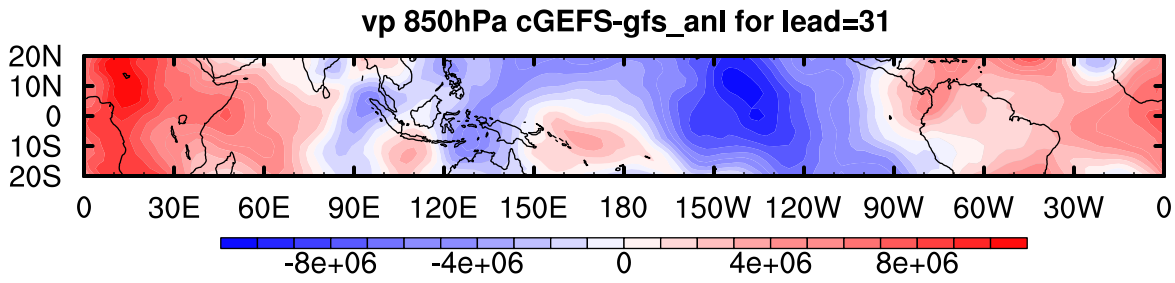

sf 200hPa cGEFS-gfs_anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

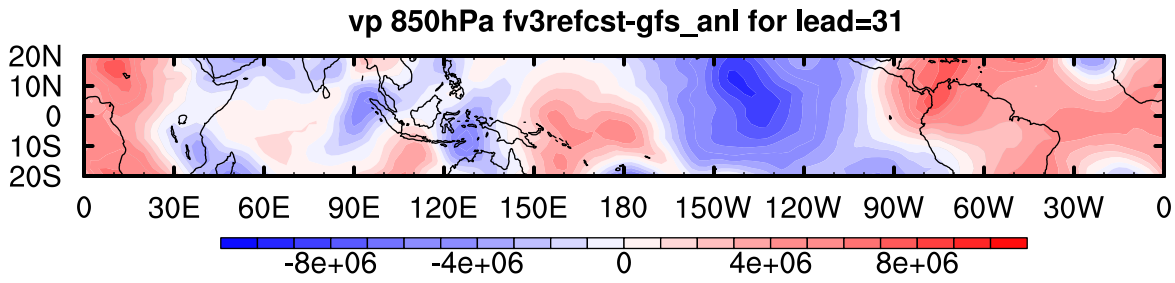

sf 200hPa fv3refcst-gfs_anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

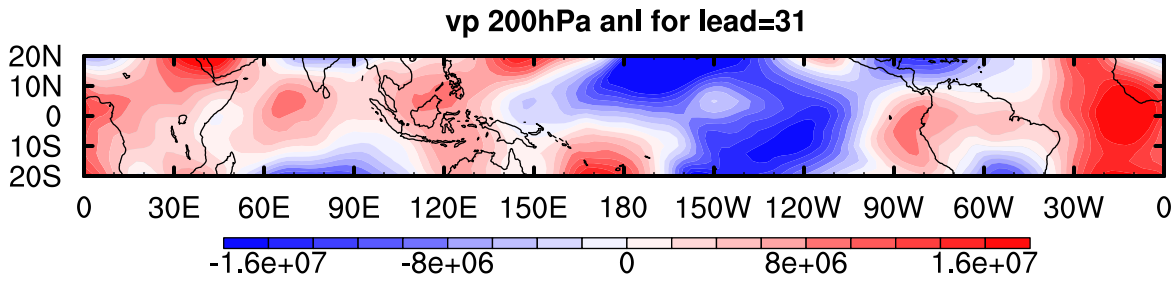

vp 850hPa anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

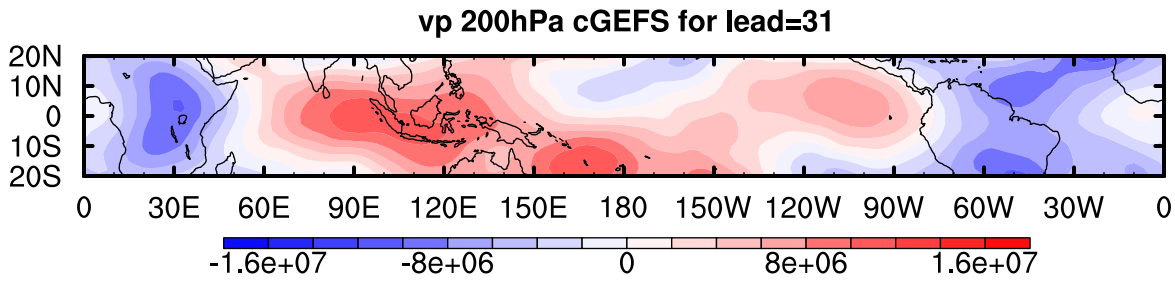

vp 850hPa cGEFS for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

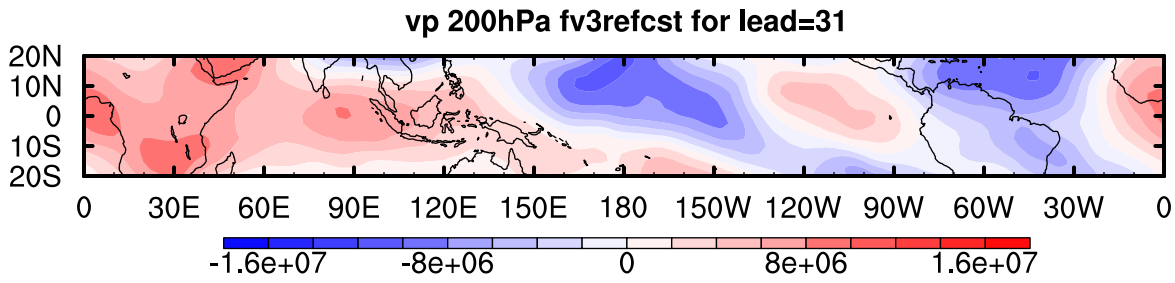

vp 850hPa fv3refcst for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

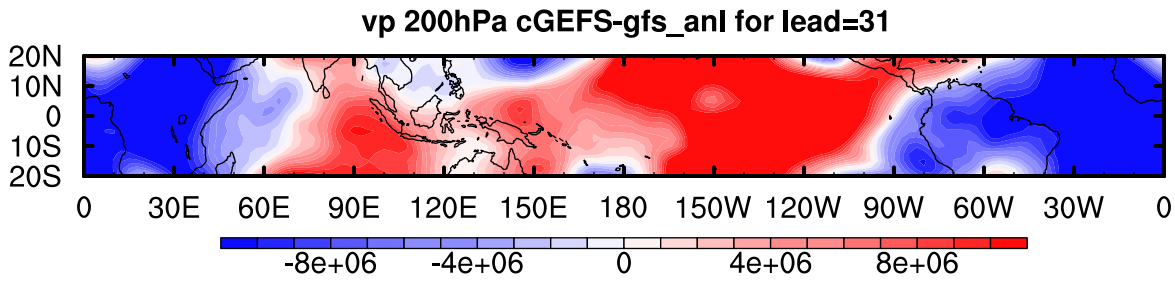

vp 850hPa cGEFS-gfs_anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

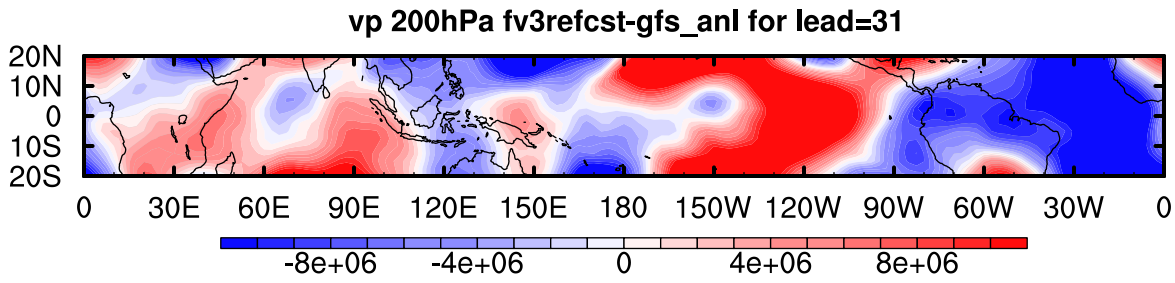

vp 850hPa fv3refcst-gfs_anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

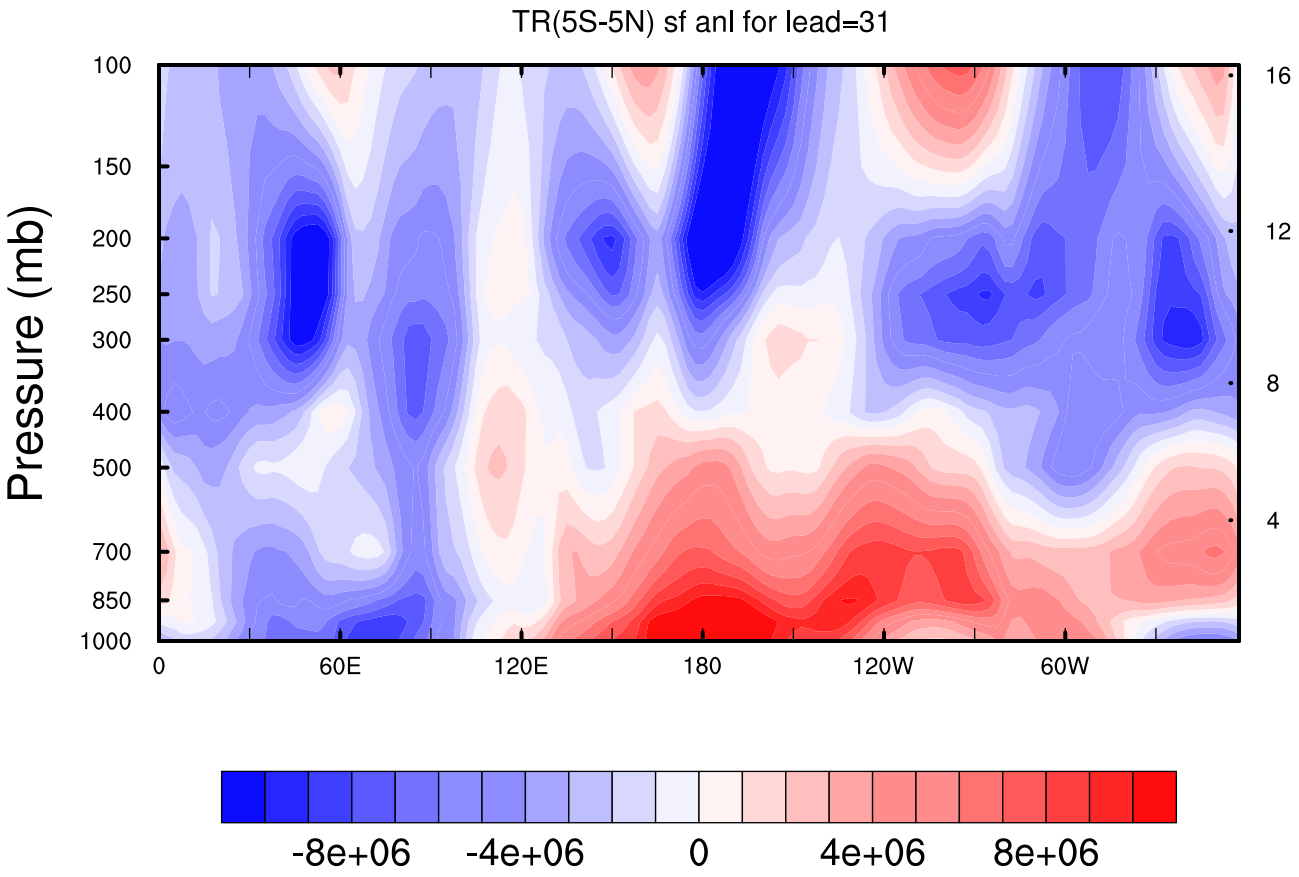

vp 200hPa anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

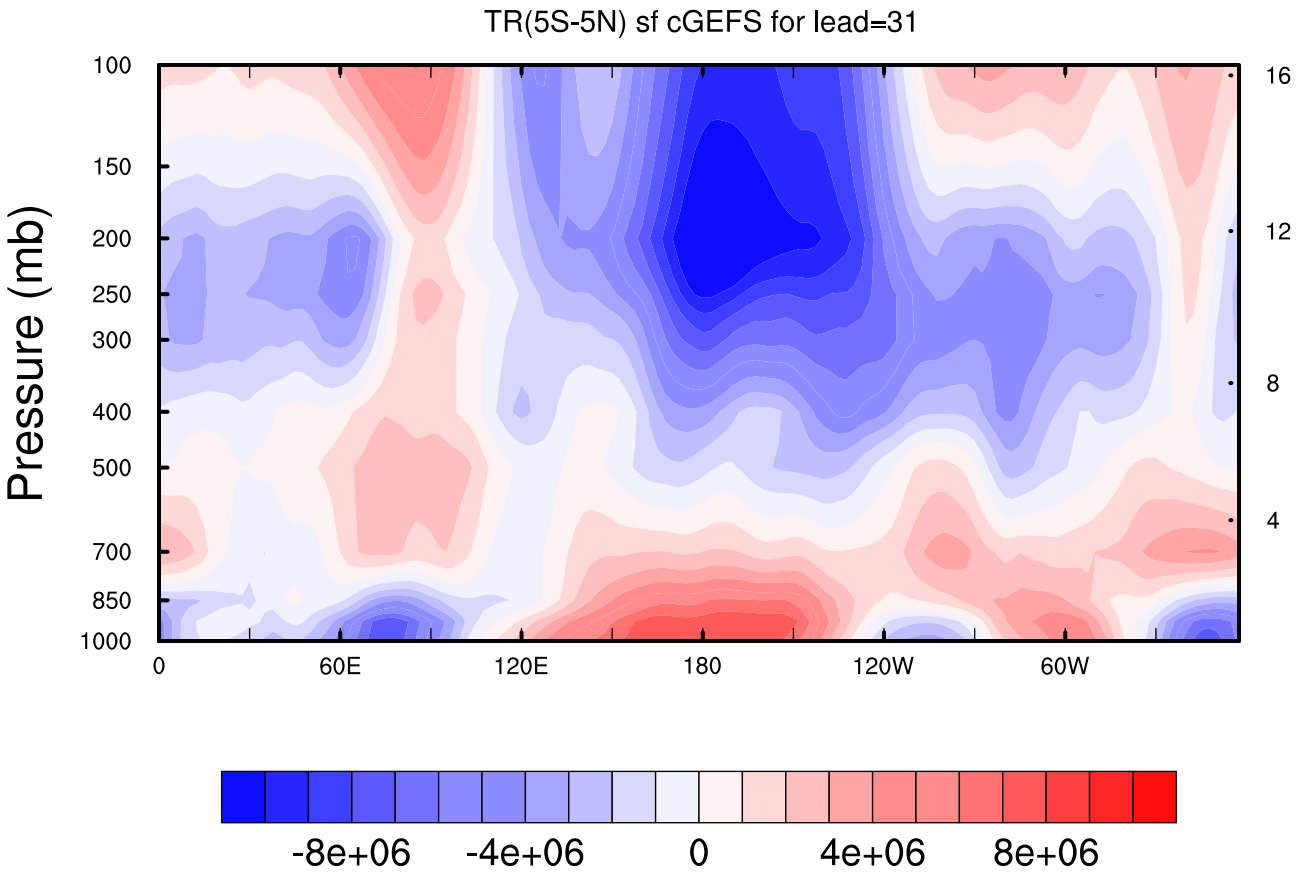

vp 200hPa cGEFS for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

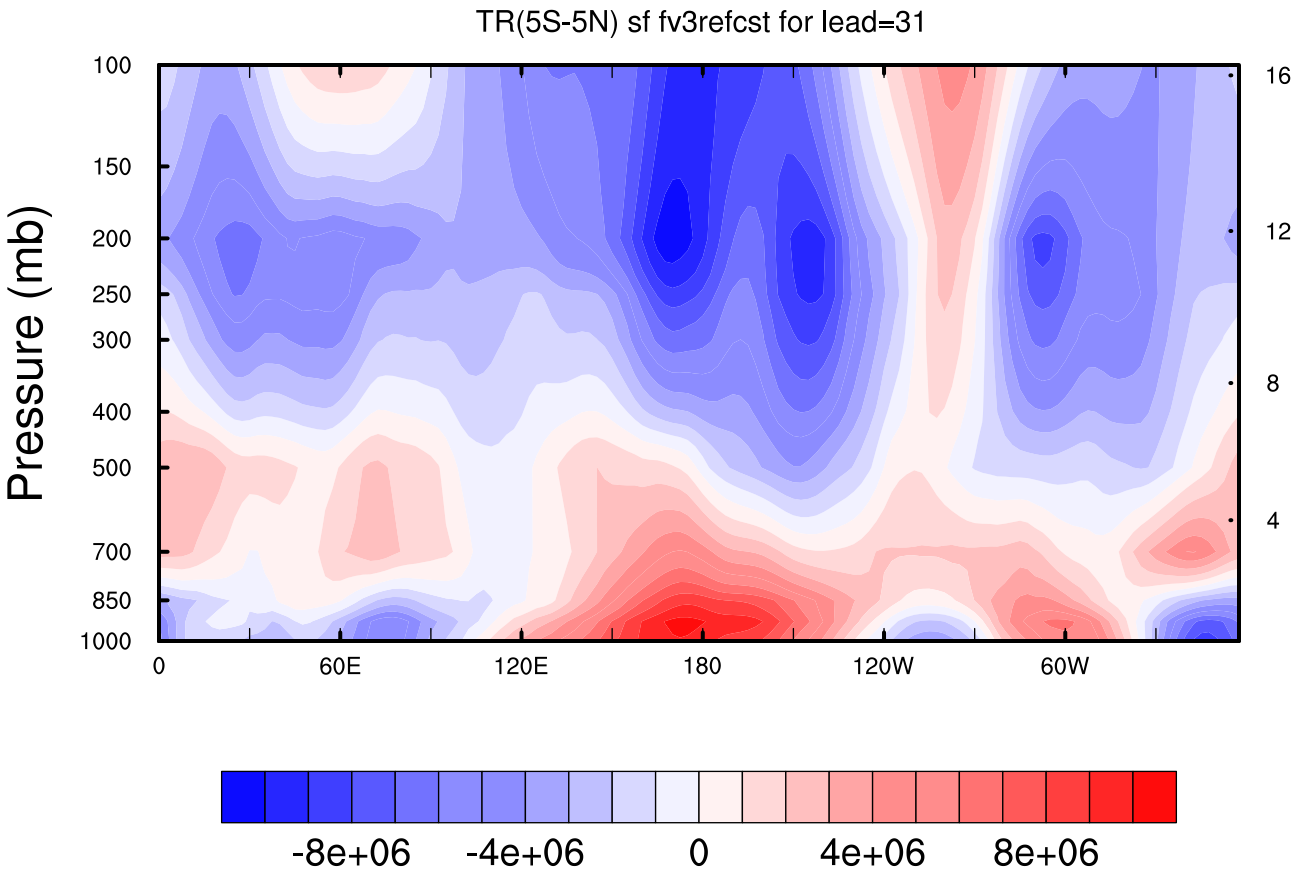

vp 200hPa fv3refcst for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

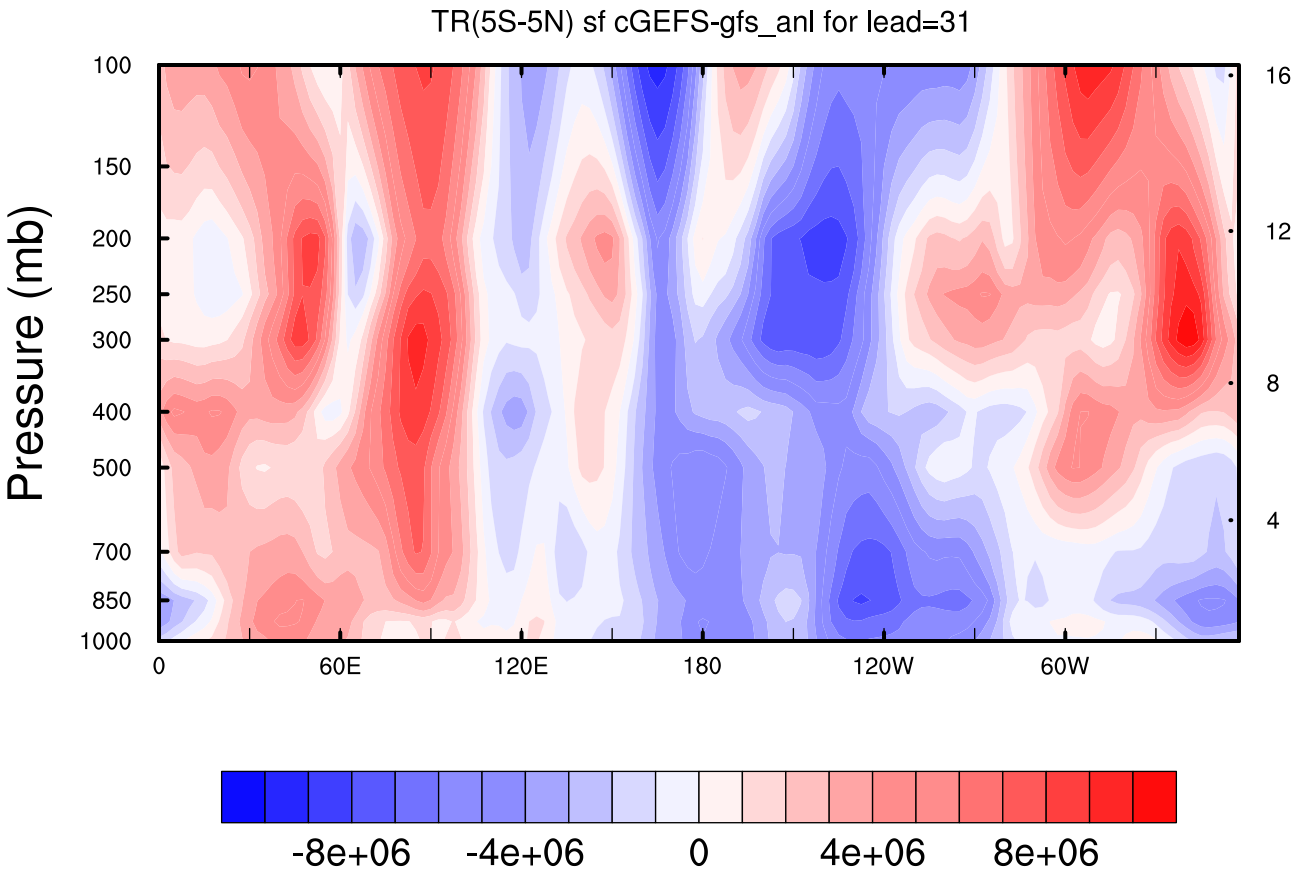

vp 200hPa cGEFS-gfs_anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

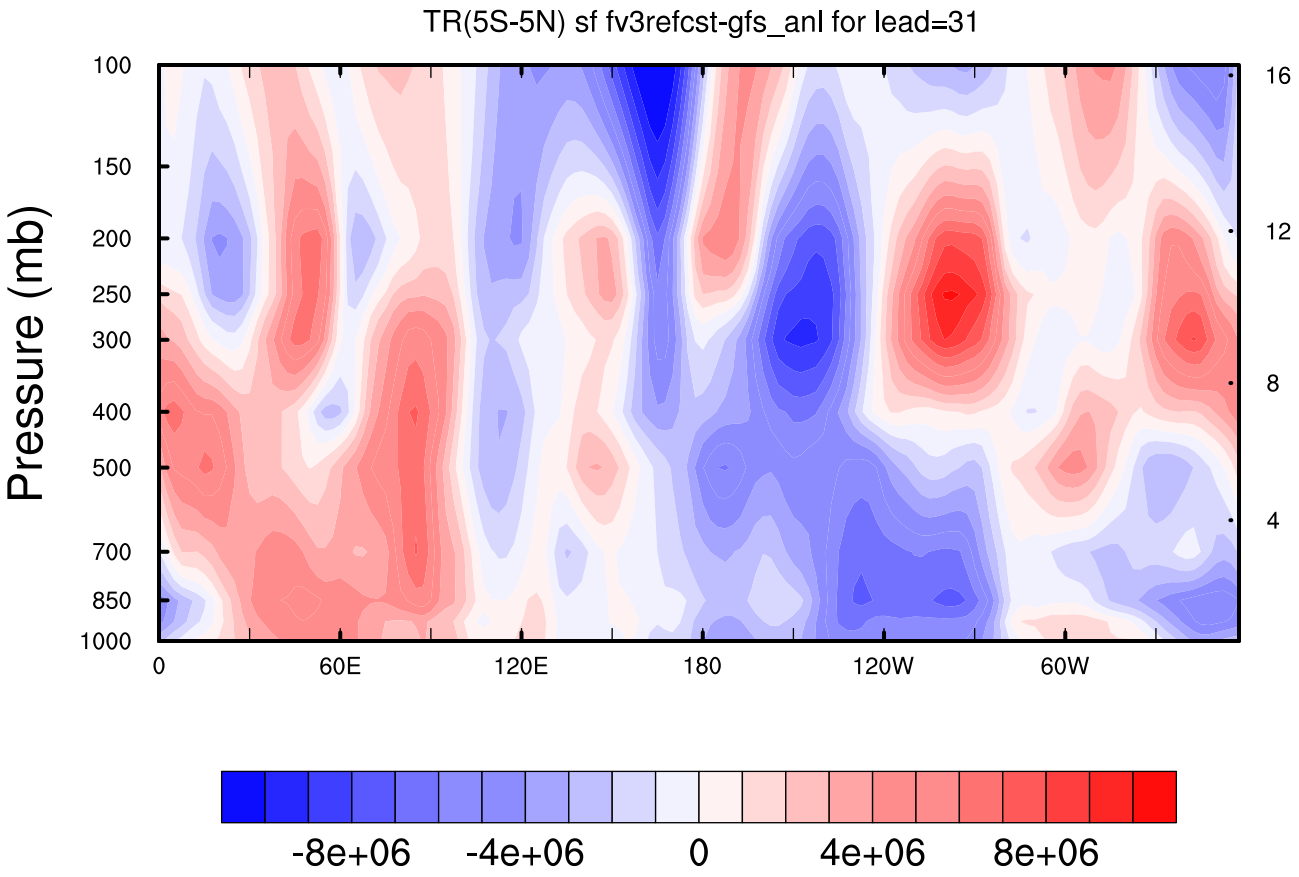

vp 200hPa fv3refcst-gfs_anl for lead=31
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

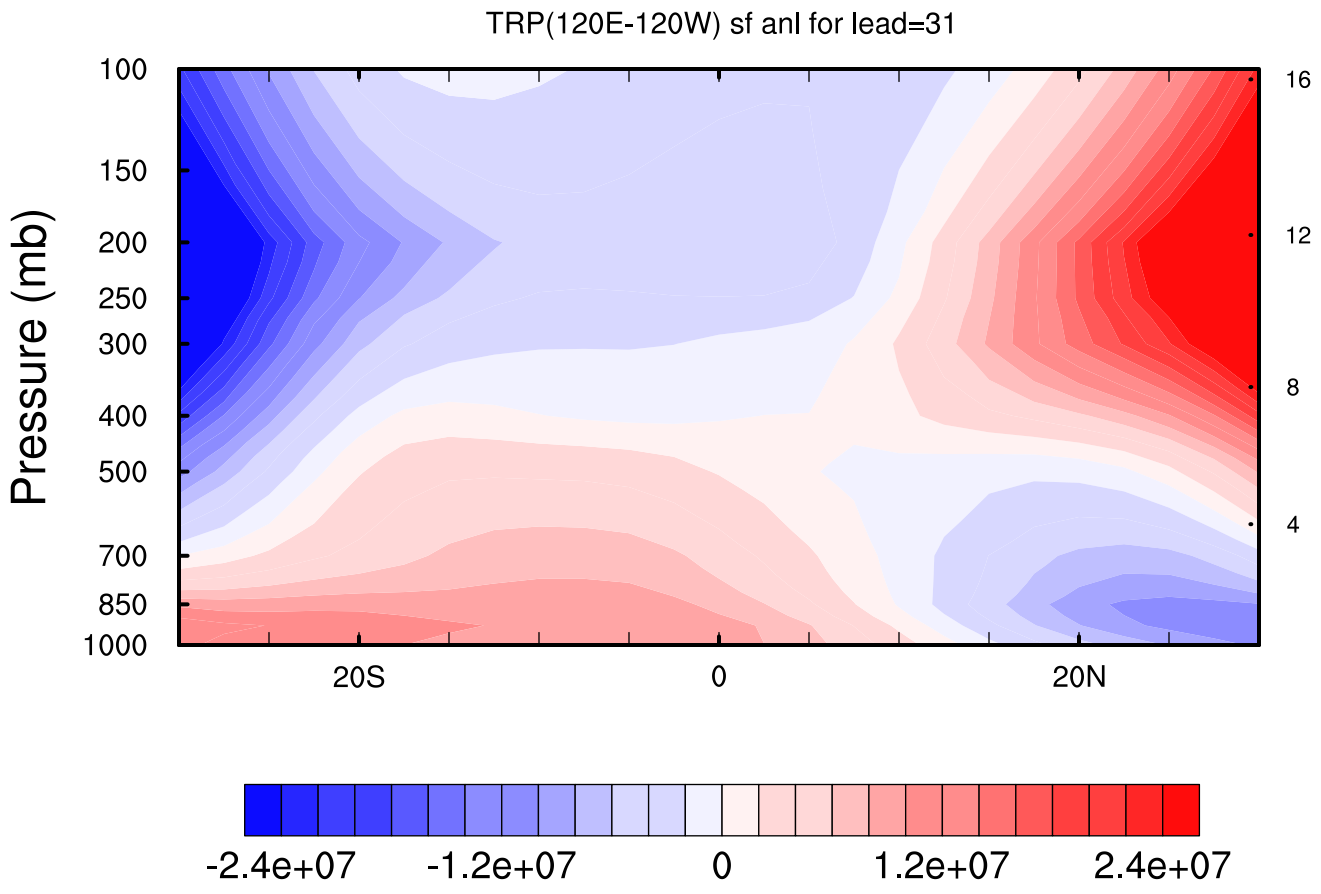

TR(5S-5N) sf anl for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

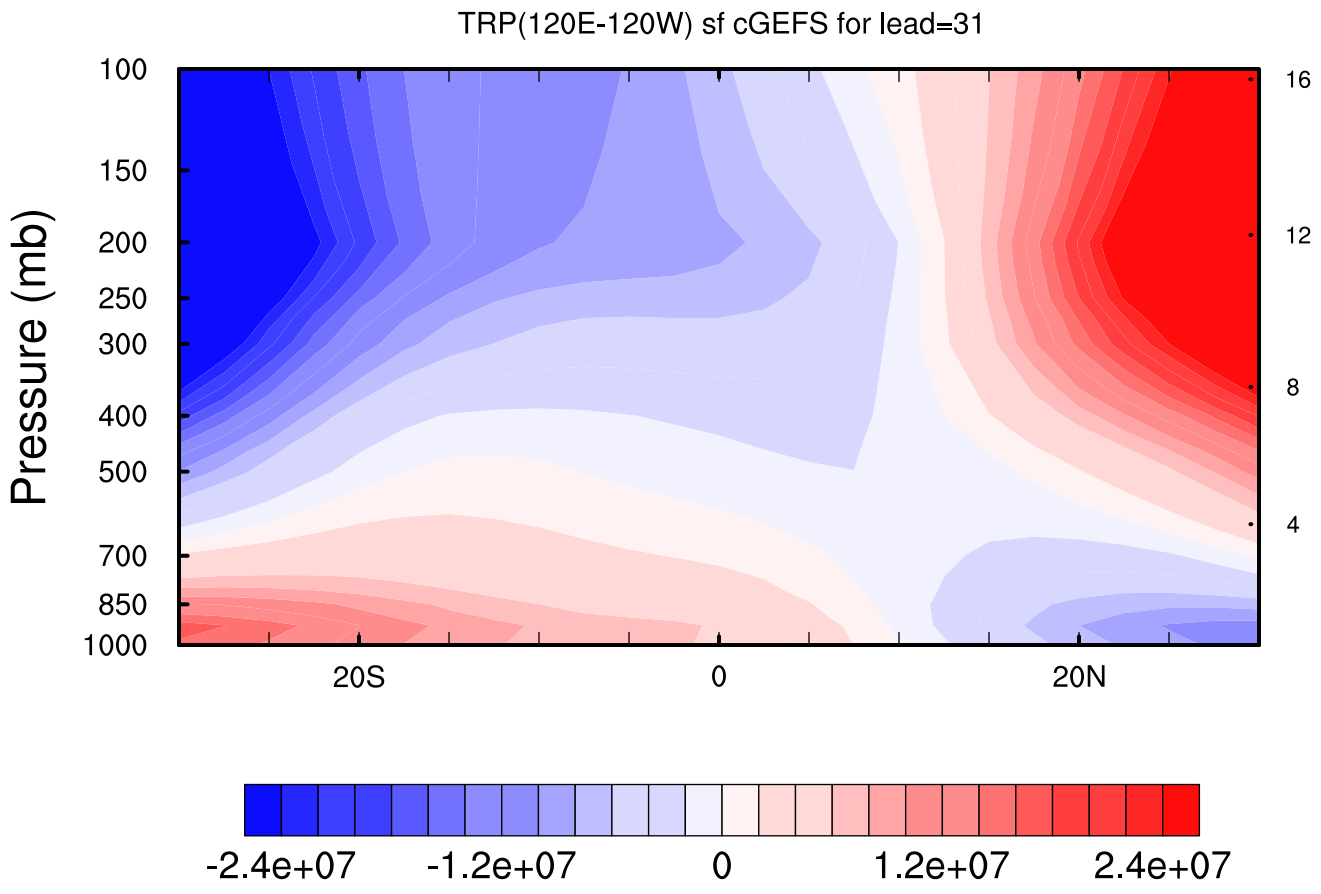

TR(5S-5N) sf cGEFS for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

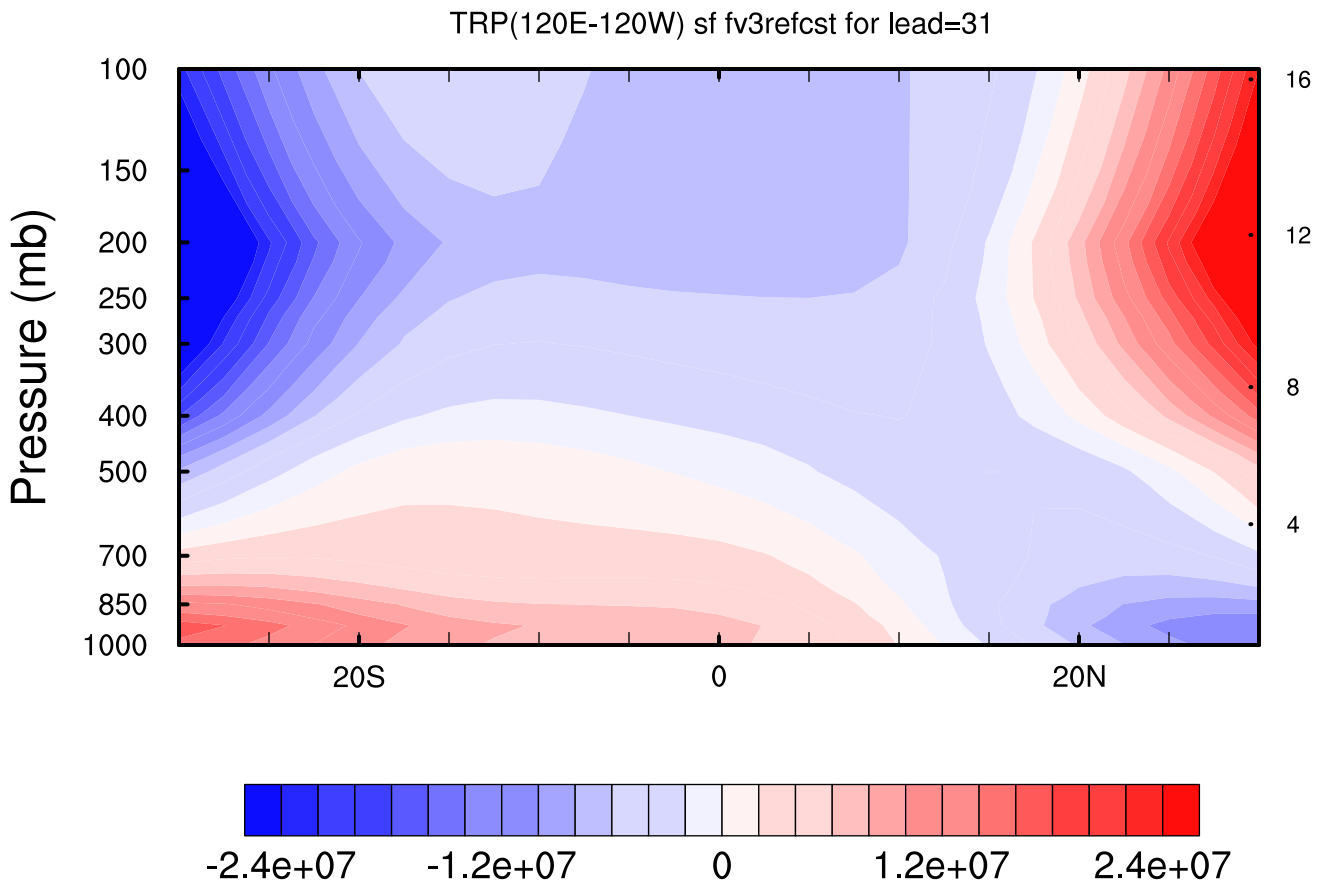

TR(5S-5N) sf fv3refcst for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
16
12
8
4
0
60E
120E
180
120W
60W
-8e+06
-4e+06
0
4e+06
8e+06

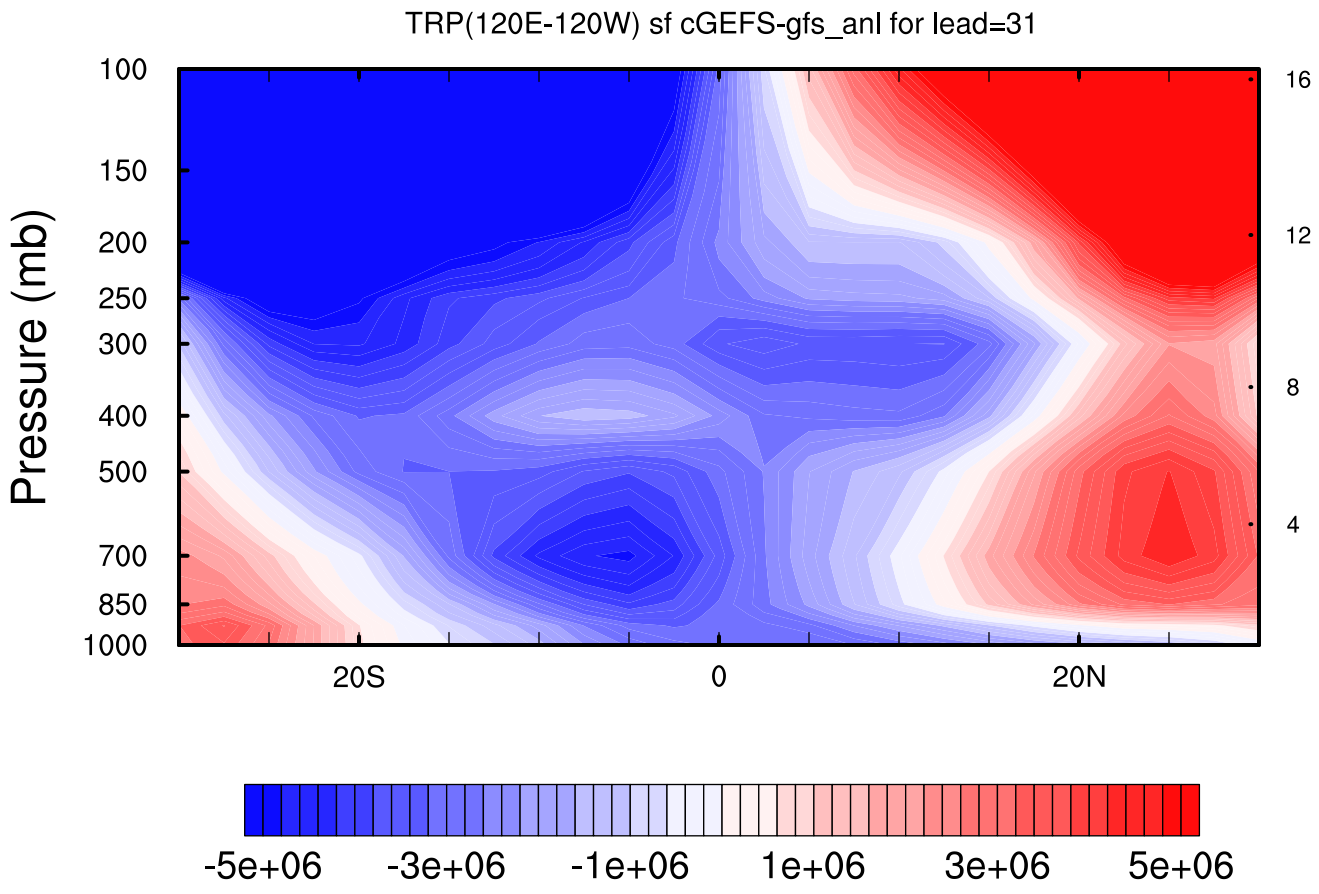

TR(5S-5N) sf cGEFS-gfs_anl for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

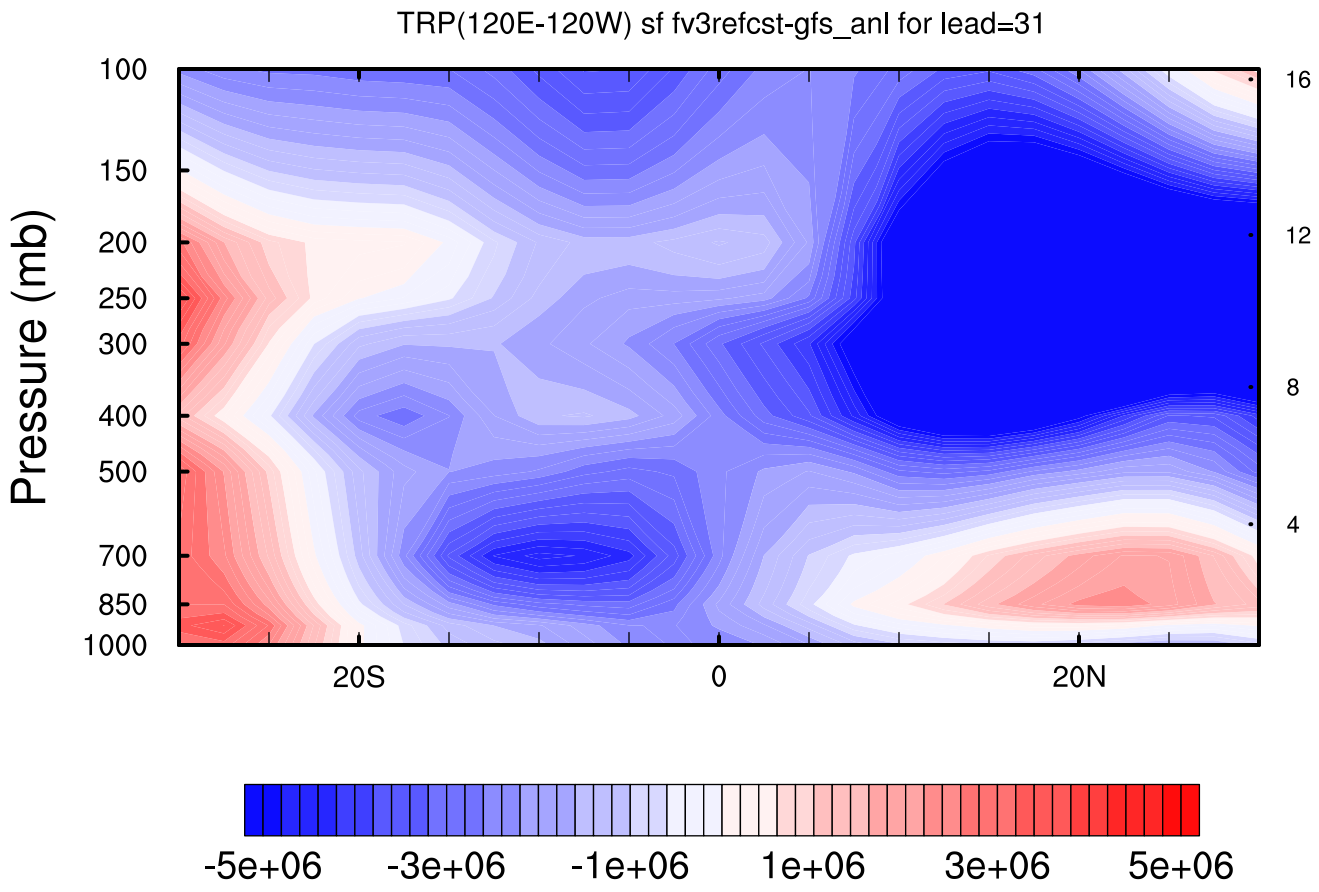

TR(5S-5N) sf fv3refcst-gfs_anl for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

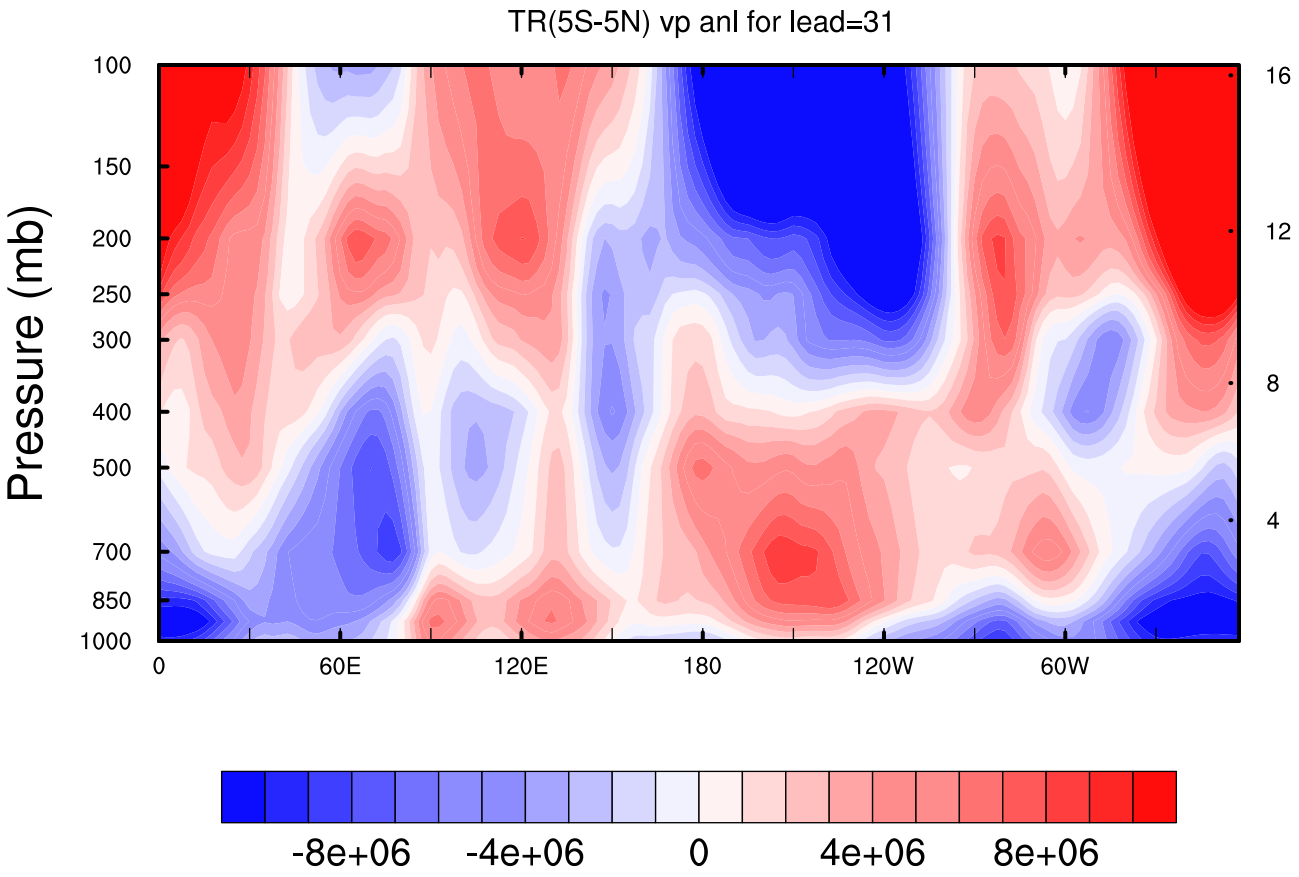

TRP(120E-120W) sf anl for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

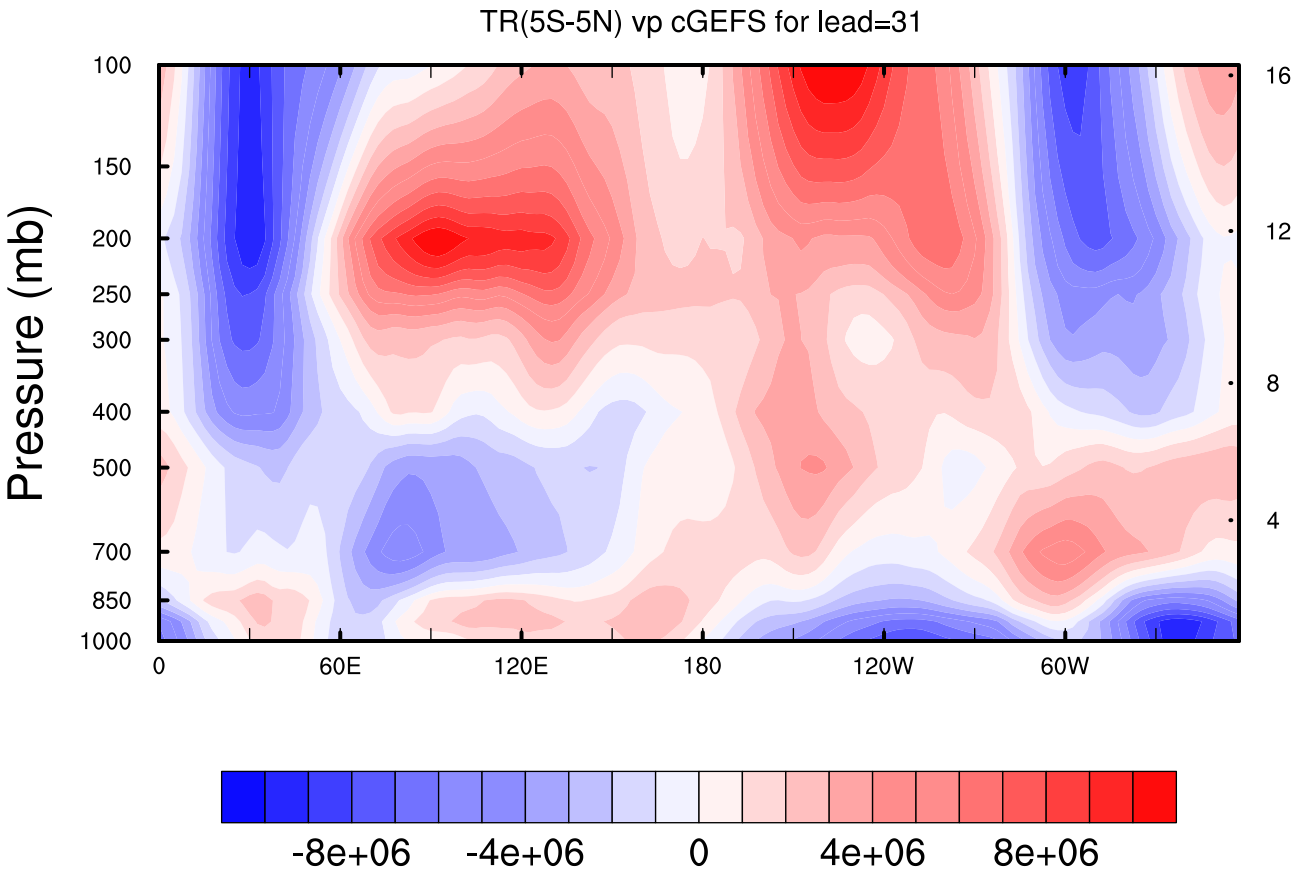

TRP(120E-120W) sf cGEFS for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


TRP(120E-120W) sf fv3refcst for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


TRP(120E-120W) sf cGEFS-gfs_anl for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06


TRP(120E-120W) sf fv3refcst-gfs_anl for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06


TR(5S-5N) vp anl for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
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120E
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120W
60W
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-4e+06
0
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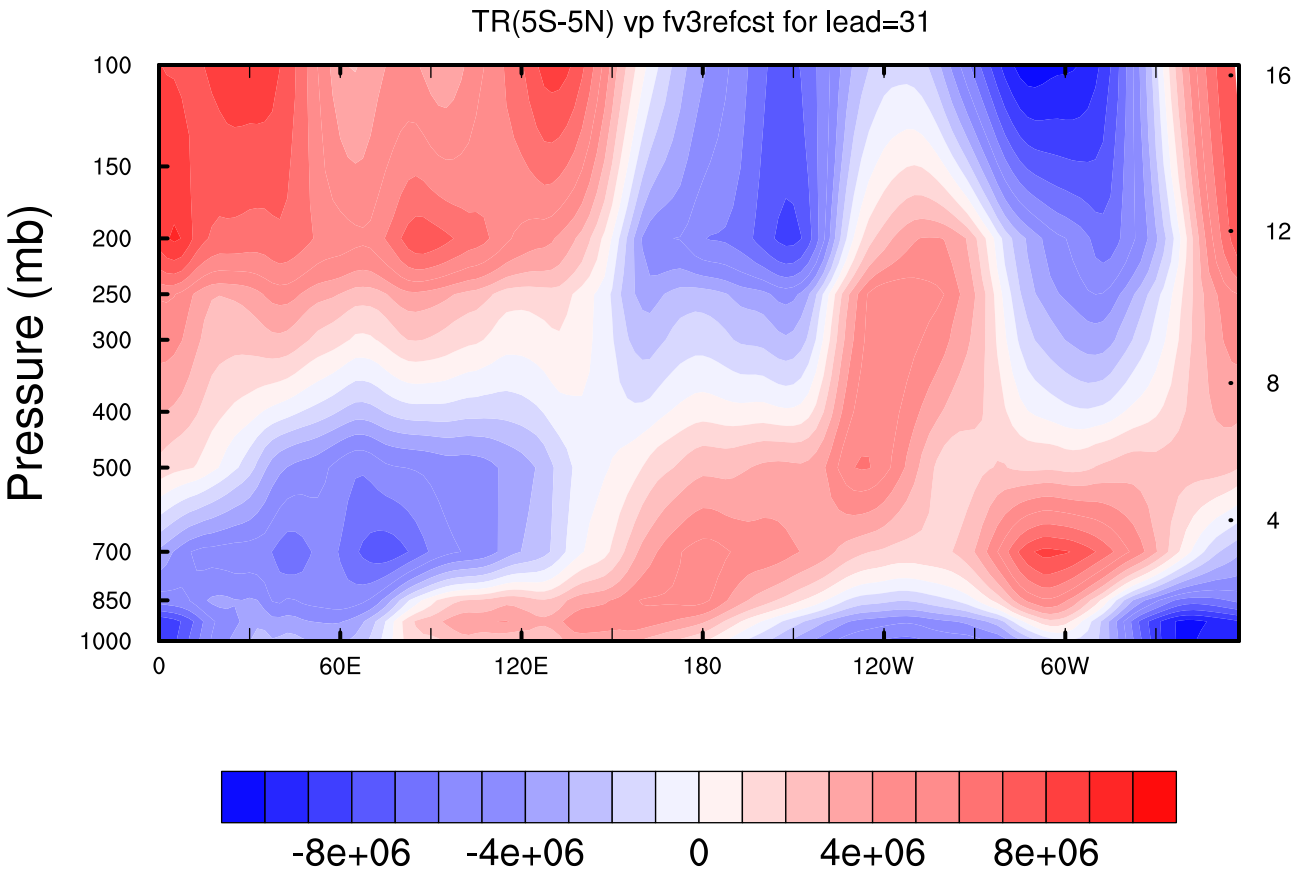
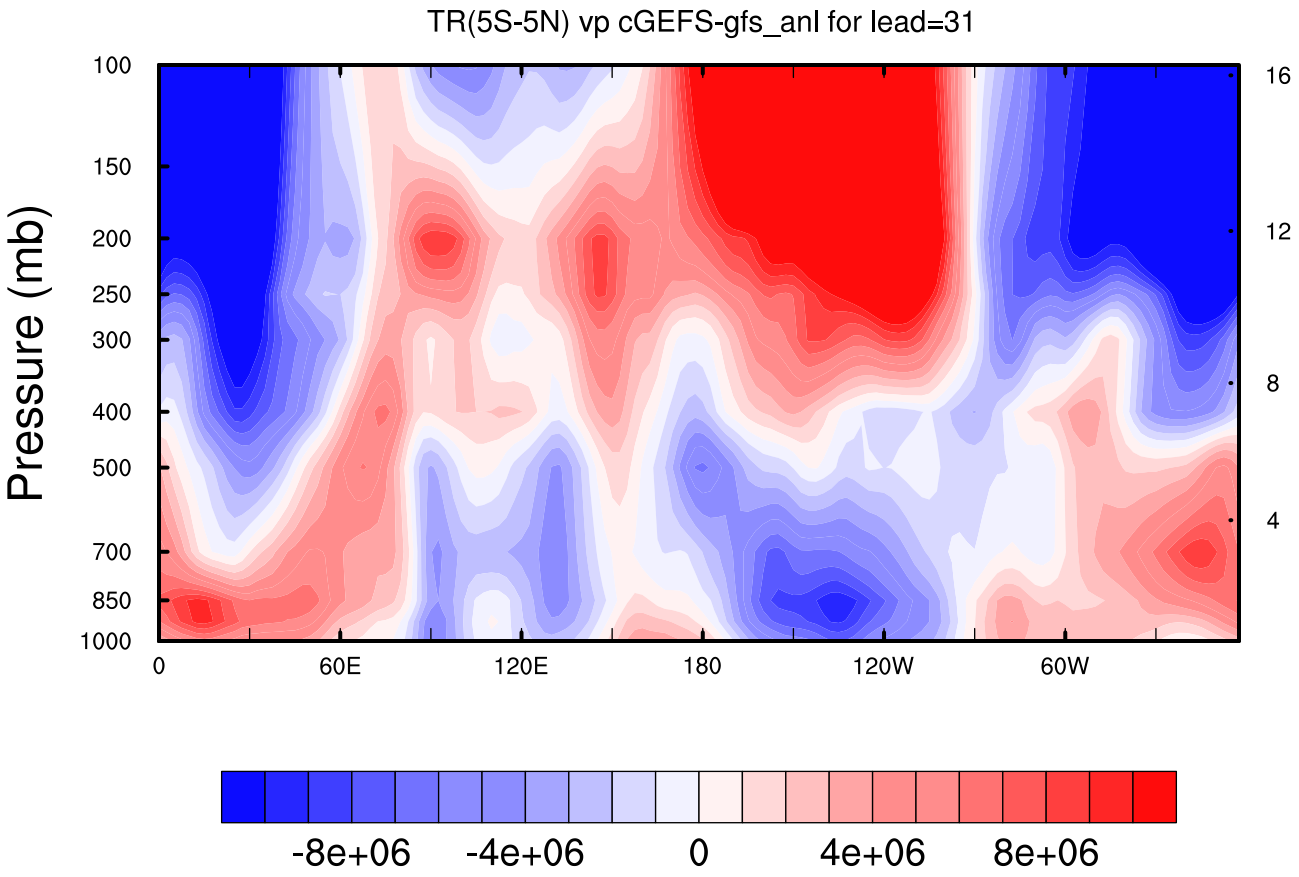
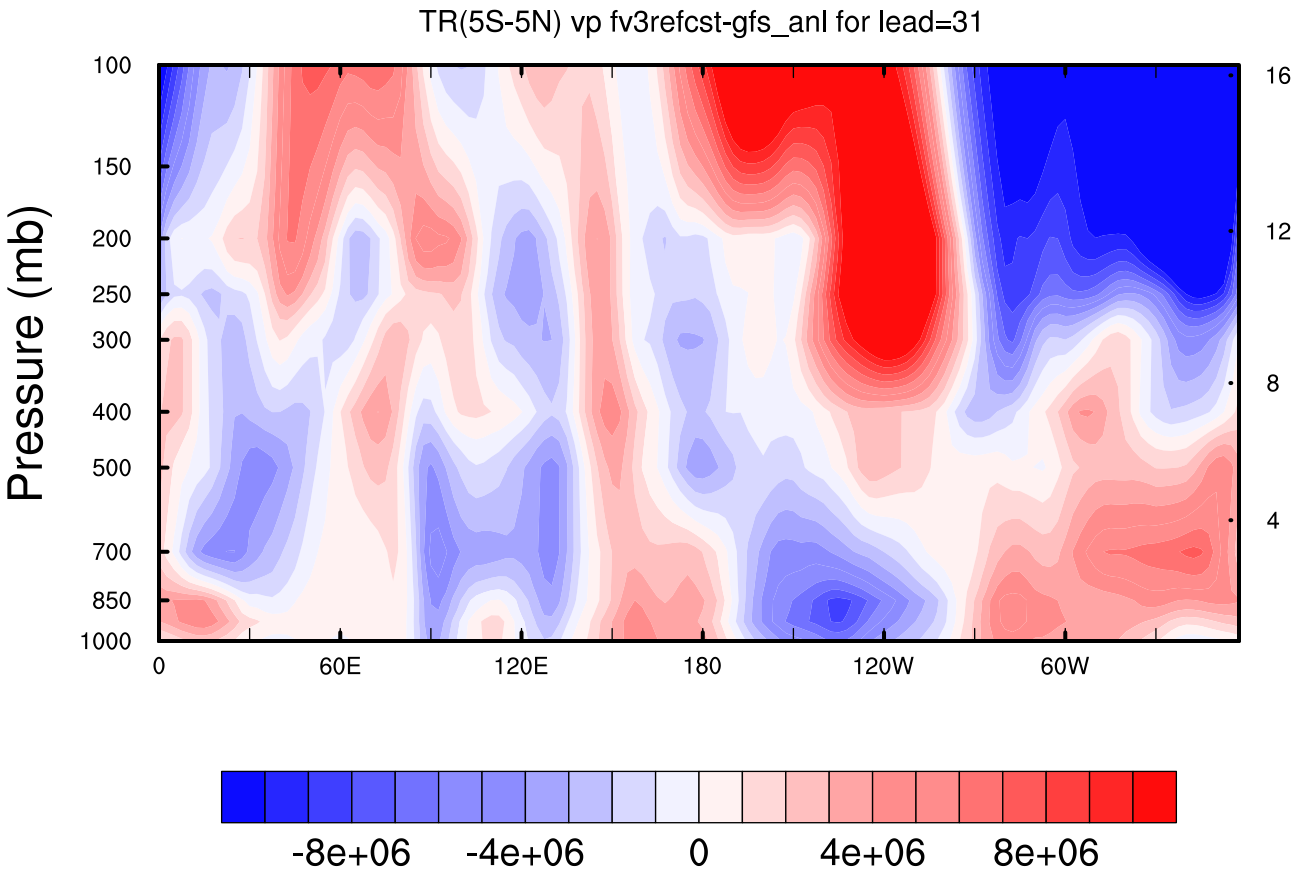
8e+06


TR(5S-5N) vp fv3refcst for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp cGEFS-gfs_anl for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst-gfs_anl for lead=31
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
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120E
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60W
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12
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4
-8e+06
-4e+06
0
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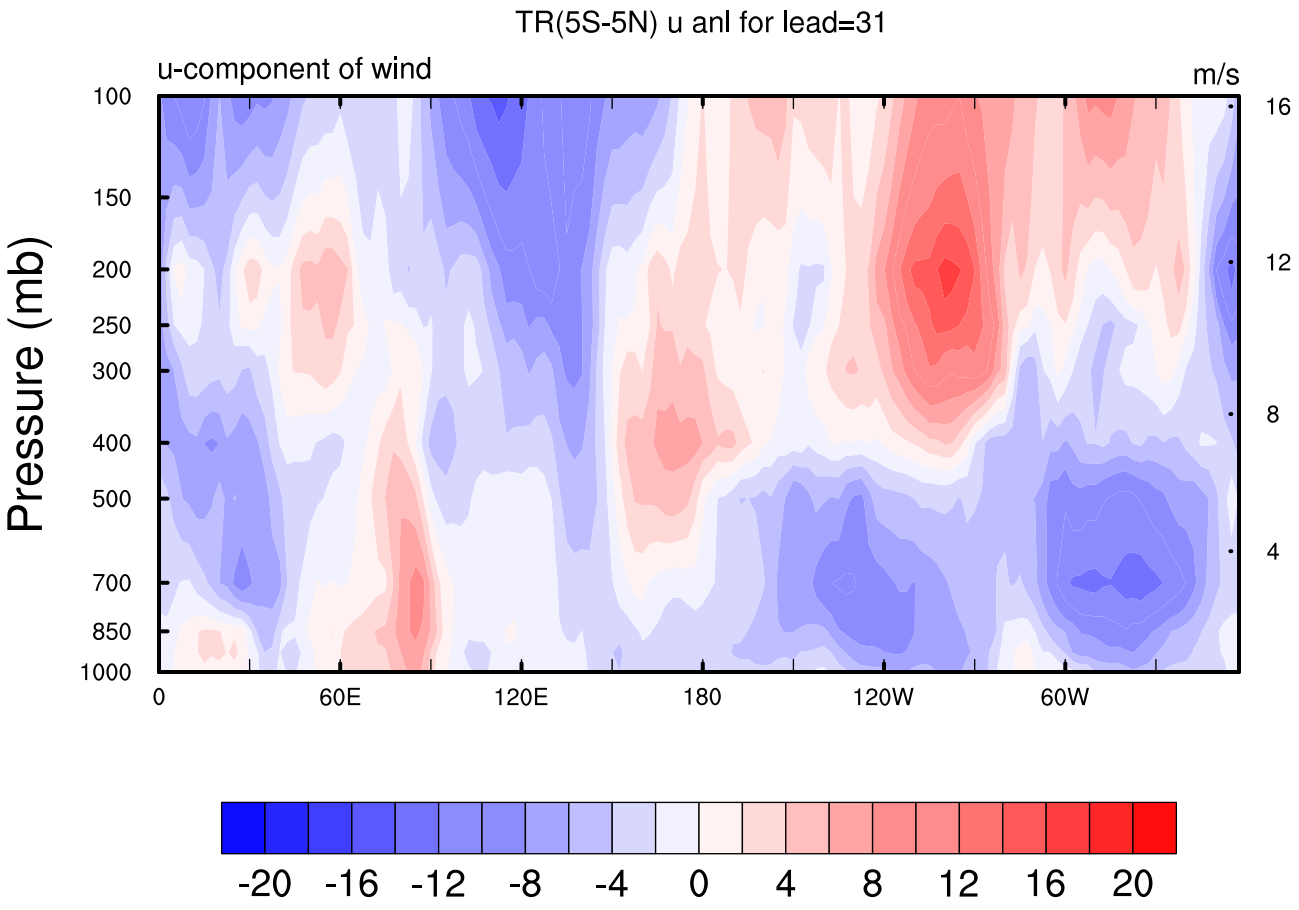
8e+06


TR(5S-5N) u anl for lead=31
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
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8
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-20
-16
-12
-8
-4
0
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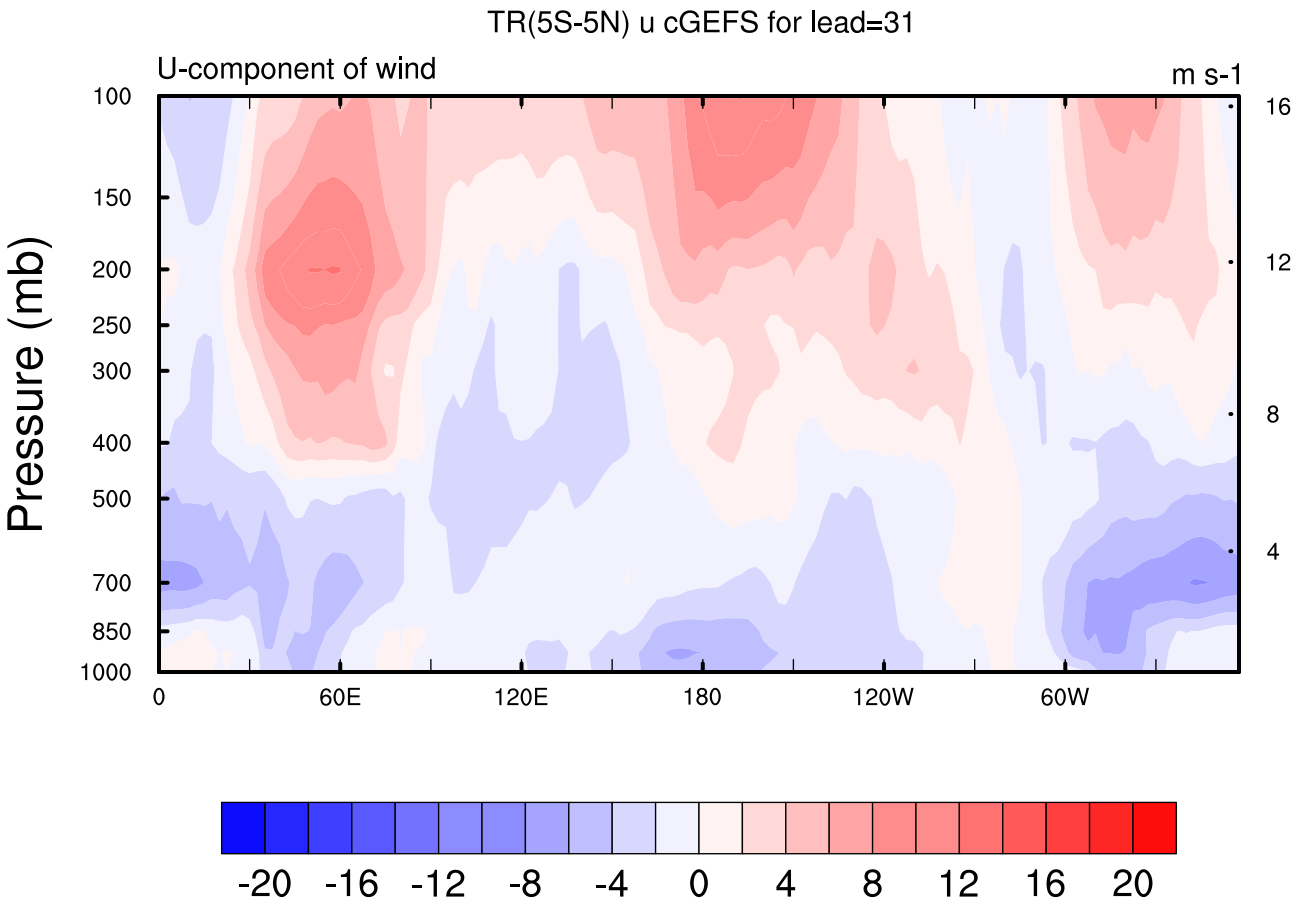
8
12
16
20


TR(5S-5N) u cGEFS for lead=31
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
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120W
60W
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-20
-16
-12
-8
-4
0
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8
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16
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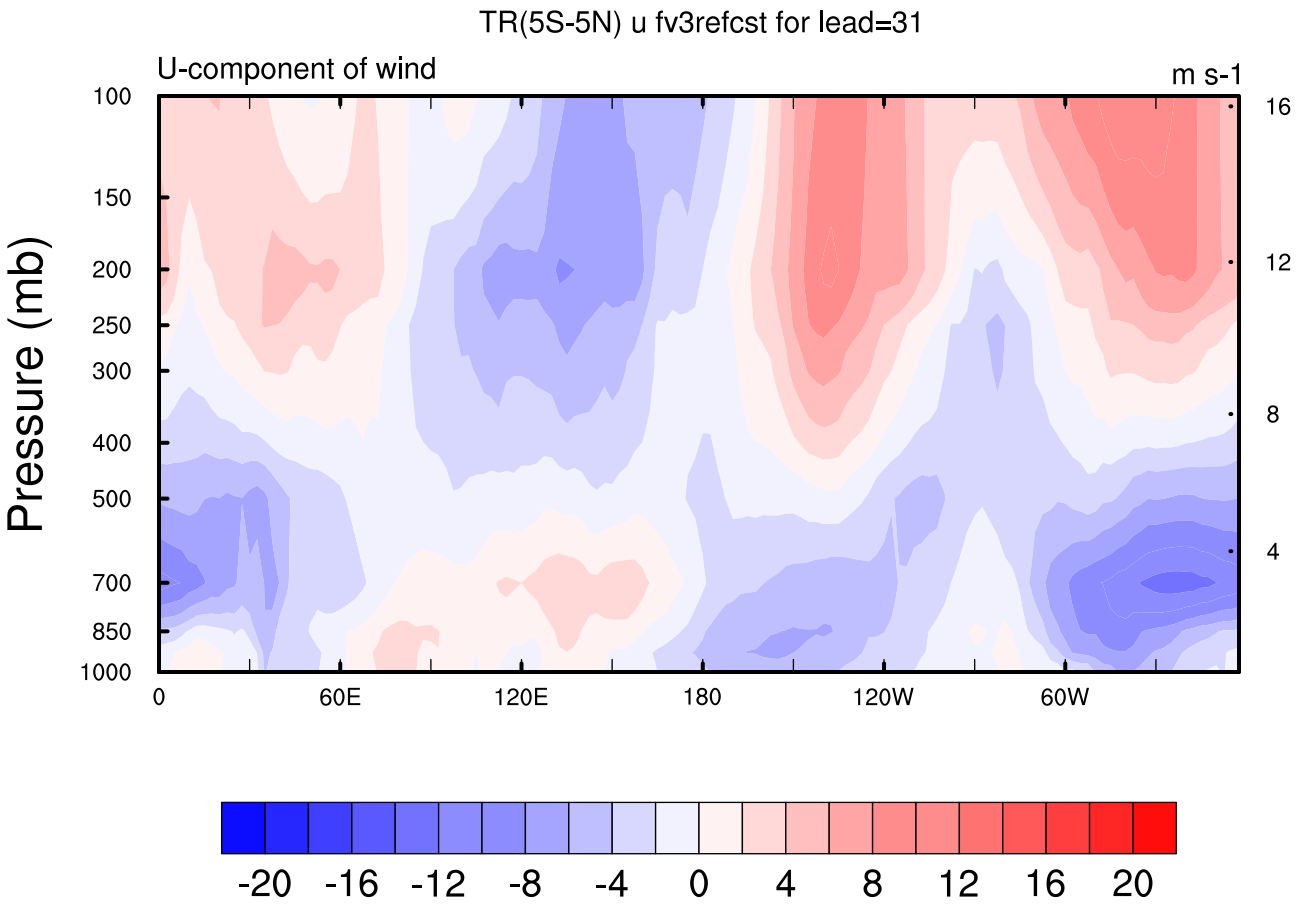
TR(5S-5N) u fv3refcst for lead=31
U-component of wind
m s-1
Pressure (mb)
100
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1000
0
60E
120E
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-20
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-12
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-4
0
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8
12
16
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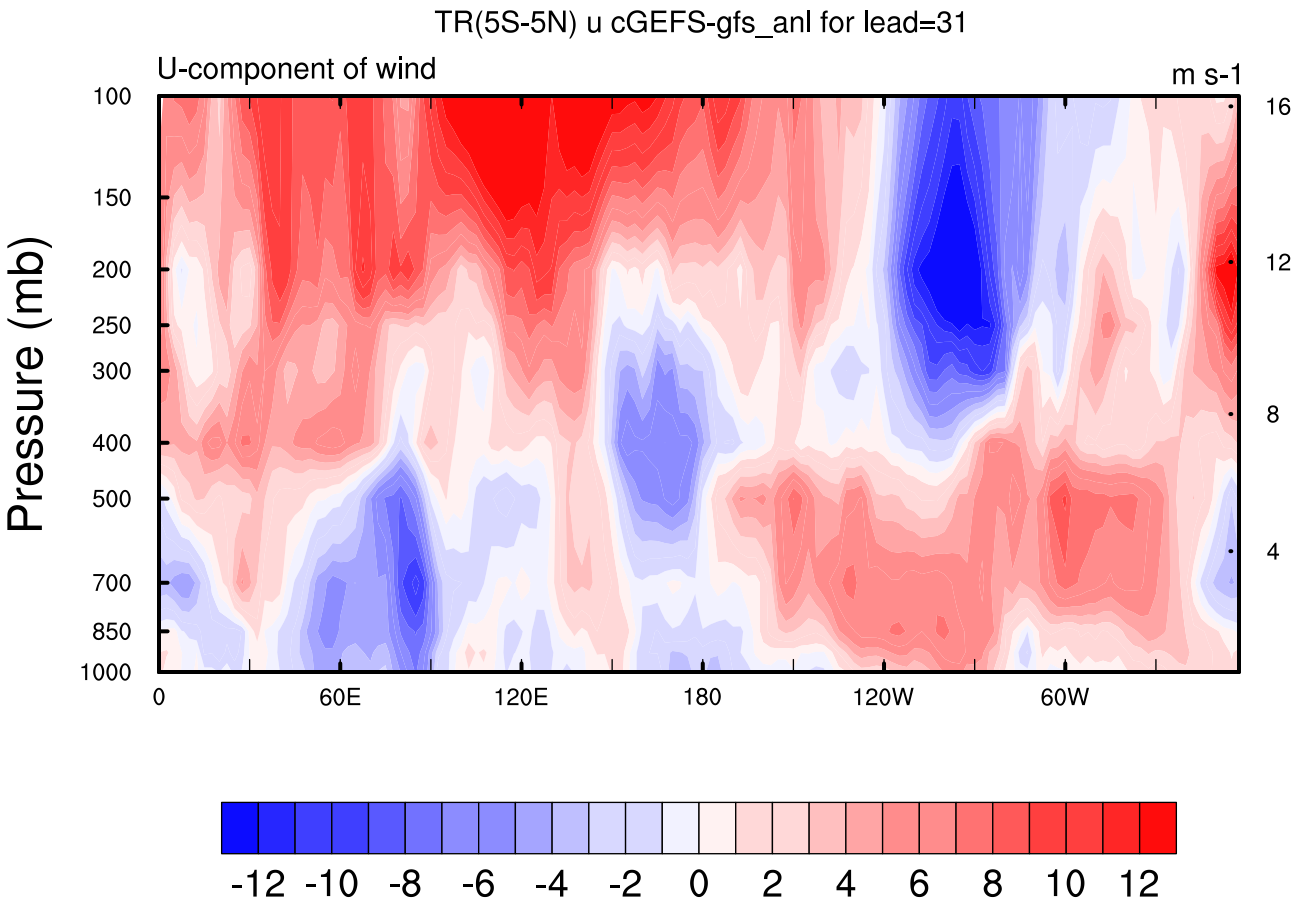
TR(5S-5N) u cGEFS-gfs_anl for lead=31
U-component of wind
m s-1
Pressure (mb)
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150
200
250
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700
850
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0
60E
120E
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120W
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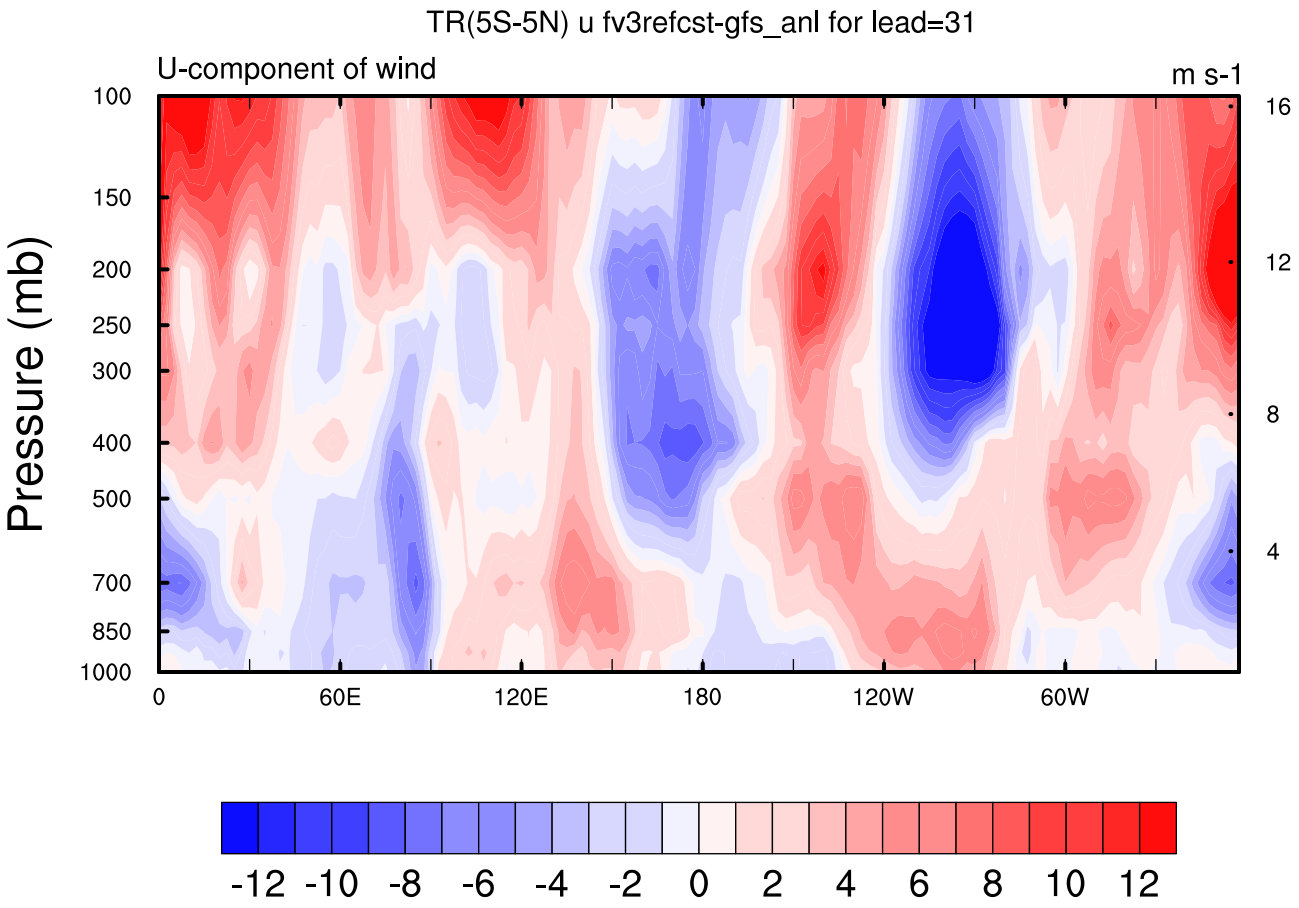
TR(5S-5N) u fv3refcst-gfs_anl for lead=31
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
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120W
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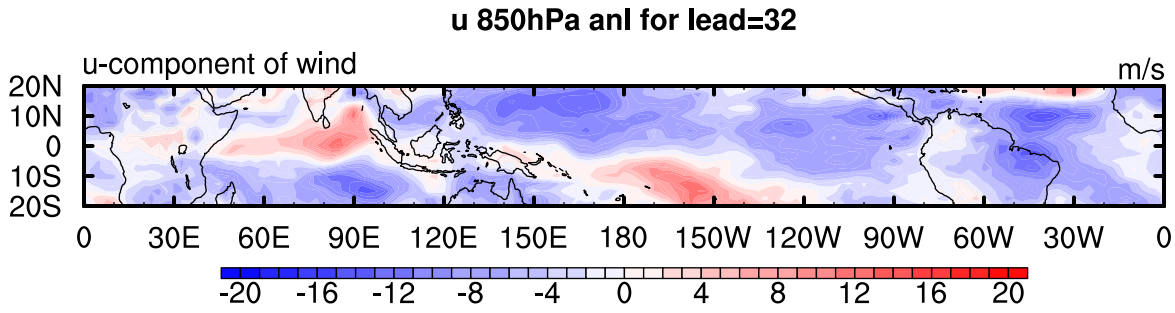
u 850hPa anl for lead=32
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
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30W
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-20
-16
-12
-8
-4
0
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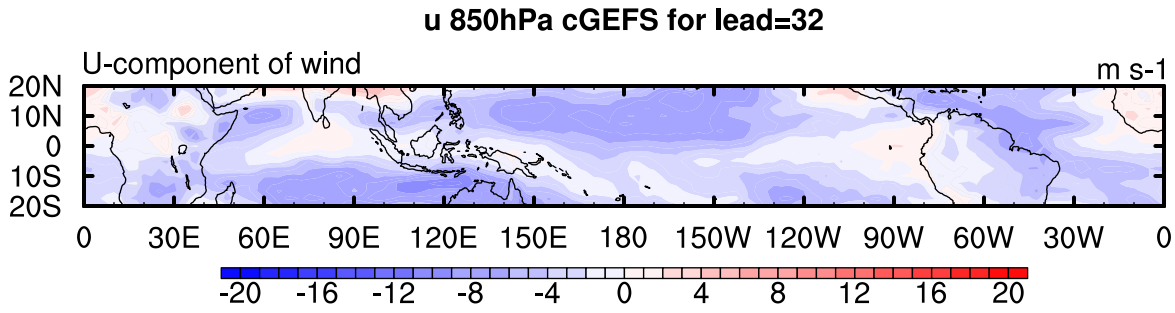
8
12
16
20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U-component of wind
m s-1
20N
10N
0
10S
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0
30E
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90E
120E
150E
180
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16
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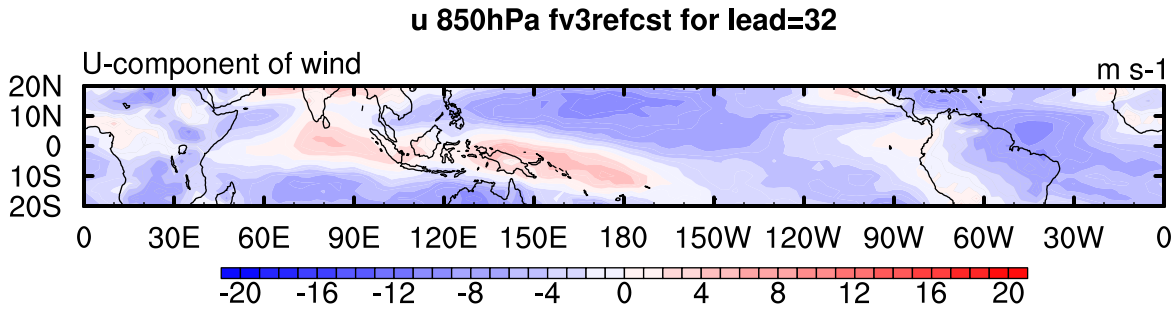
u 850hPa fv3refcst for lead=32
U-component of wind
m s-1
20N
10N
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20S
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30E
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90E
120E
150E
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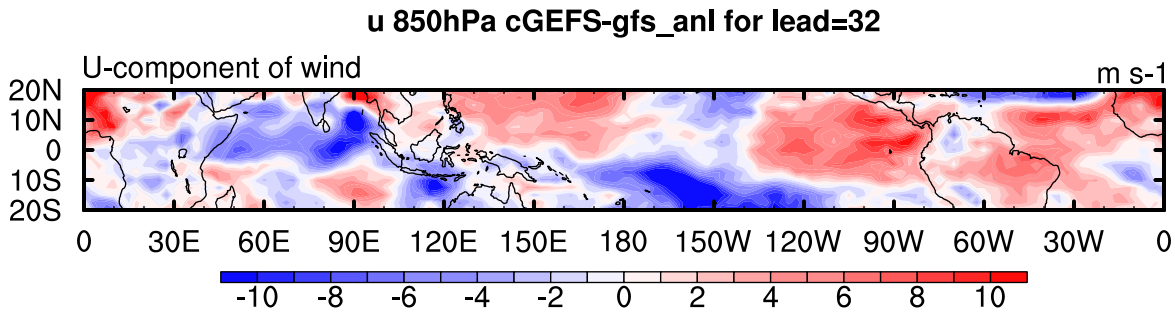
u 850hPa cGEFS-gfs_anl for lead=32
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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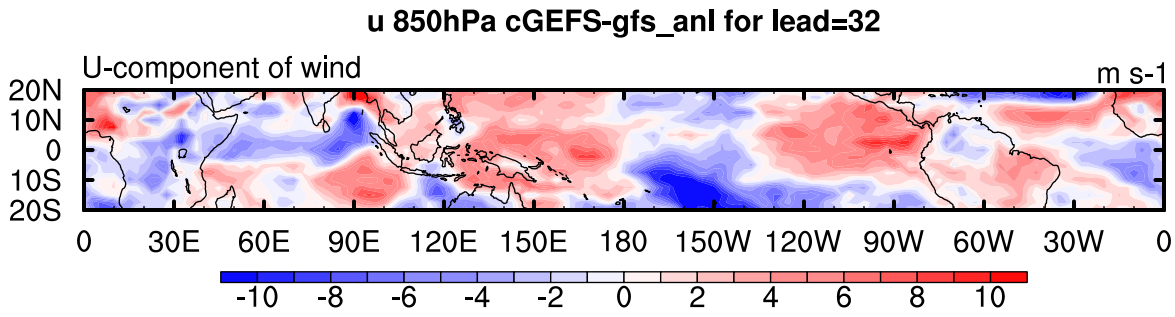
u 850hPa cGEFS-gfs_anl for lead=32
U-component of wind
m s-1
20N
10N
0
10S
20S
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30E
60E
90E
120E
150E
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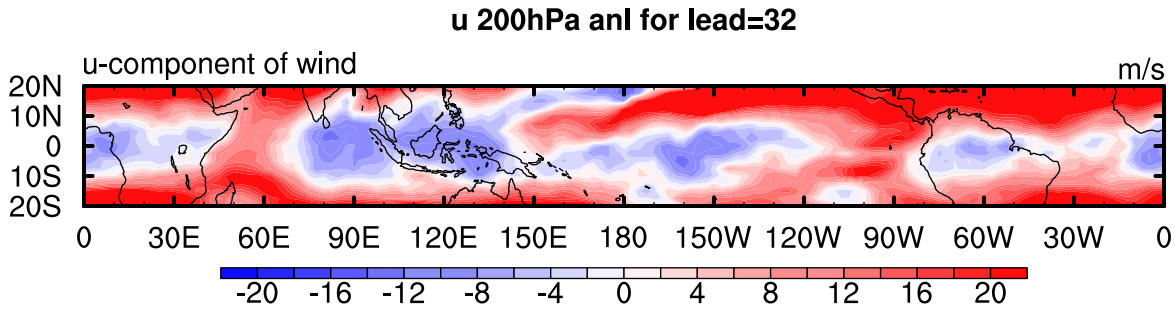
u 200hPa anl for lead=32
u-component of wind
m/s
20N
10N
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120E
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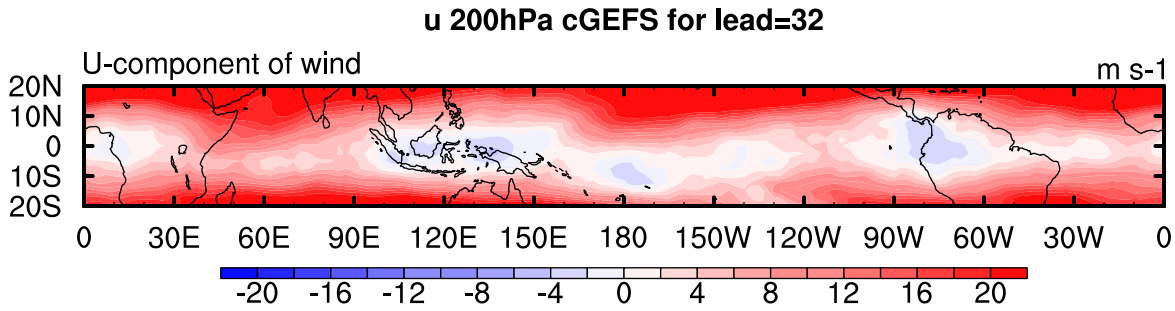
u 200hPa cGEFS for lead=32
U-component of wind
m s-1
20N
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10S
20S
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30E
60E
90E
120E
150E
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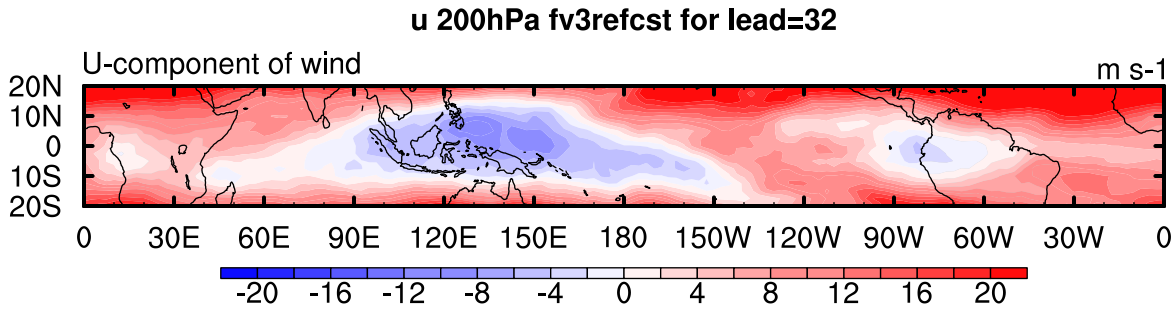
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U-component of wind
m s-1
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20S
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120E
150E
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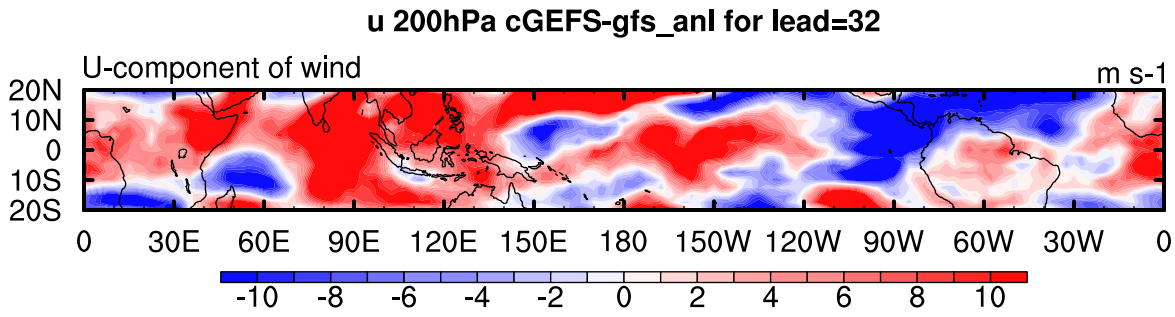
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U-component of wind
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10N
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10S
20S
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90E
120E
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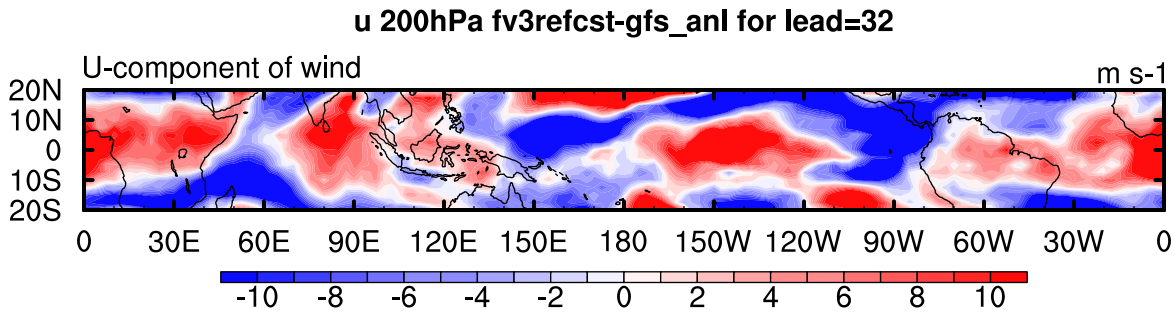
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U-component of wind
m s-1
20N
10N
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10S
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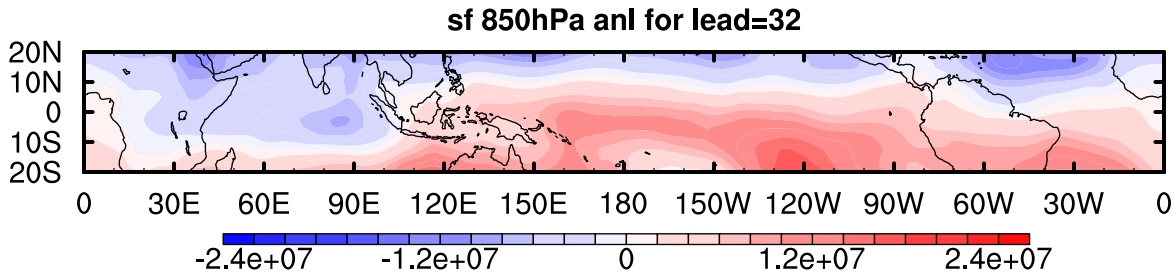
sf 850hPa anl for lead=32
20N
10N
0
10S
20S
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90E
120E
150E
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30W
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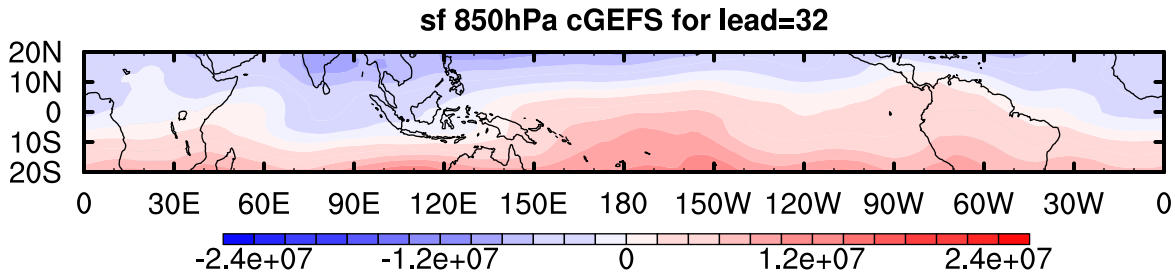
2.4e+07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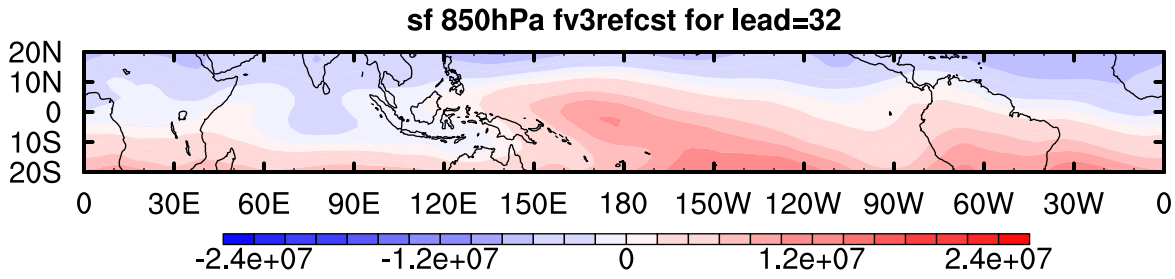
sf 850hPa fv3refcst for lead=32
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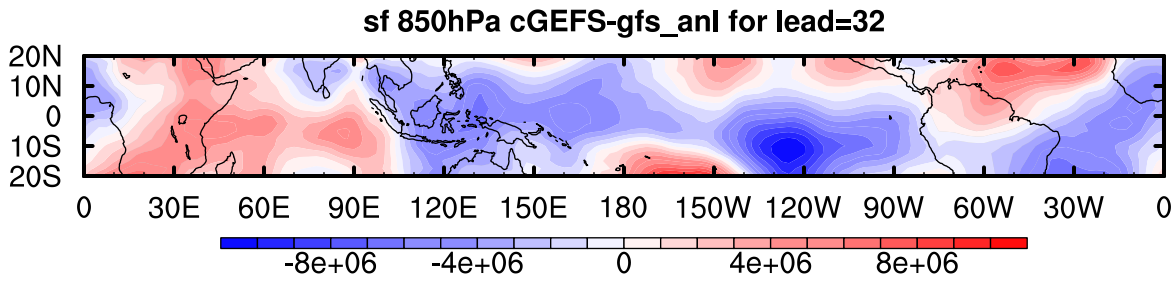
2.4e+07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-4e+06
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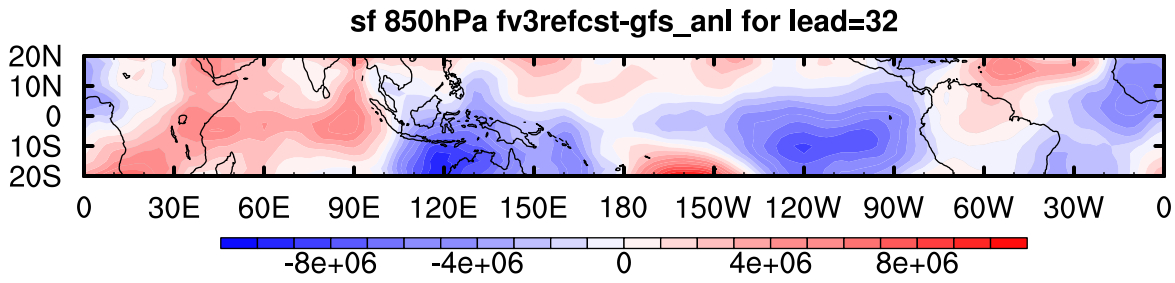
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=32
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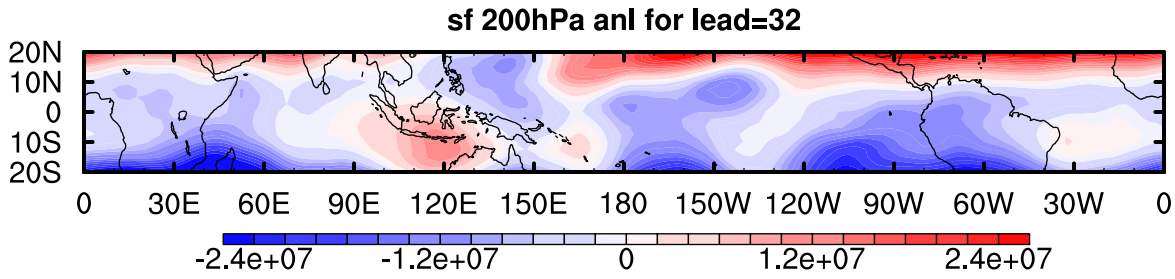
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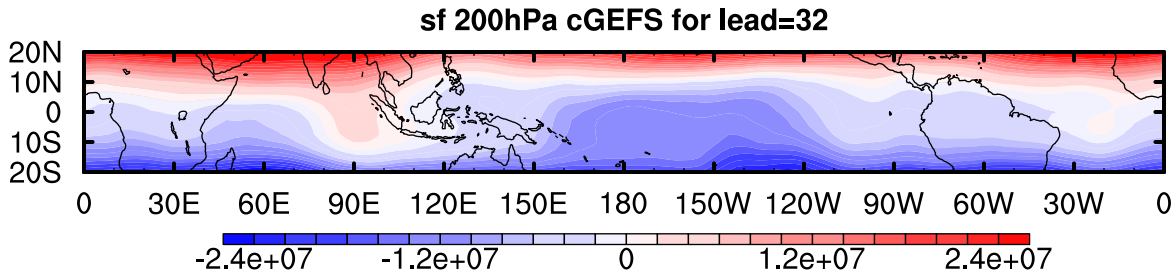
sf 200hPa cGEFS for lead=32
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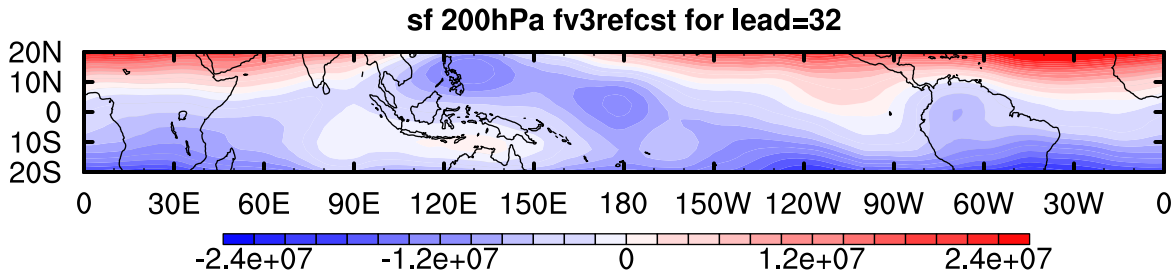
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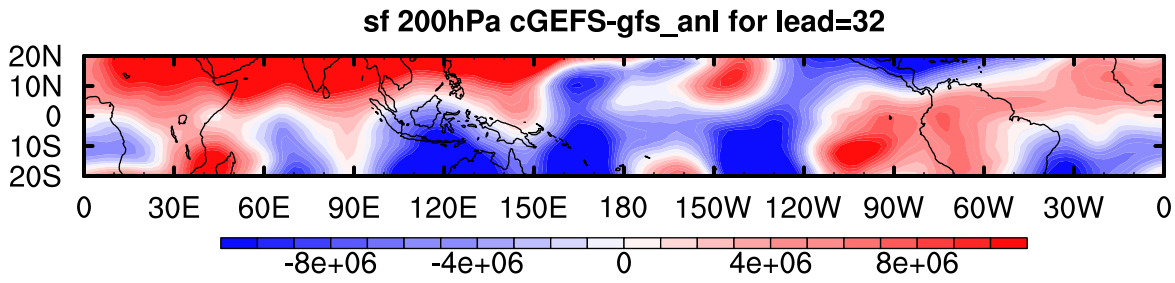
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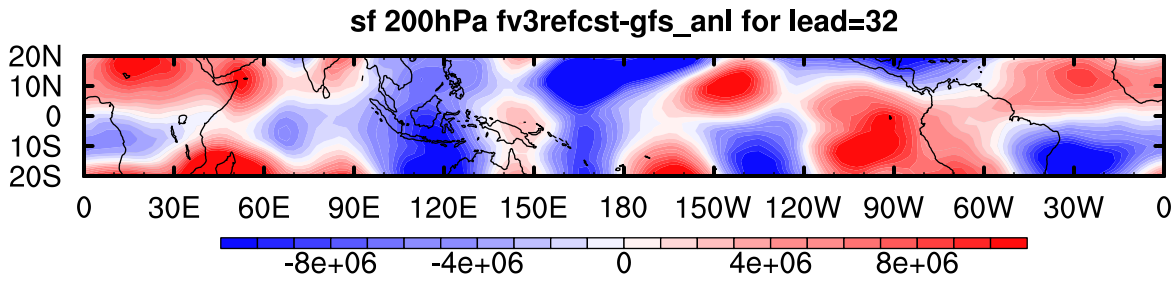
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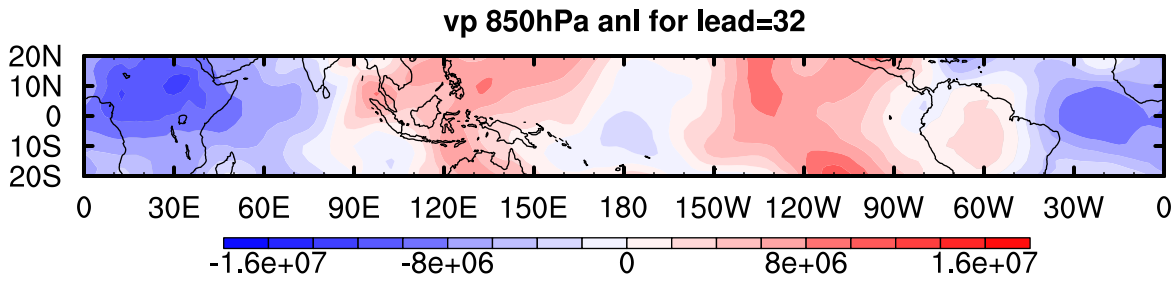
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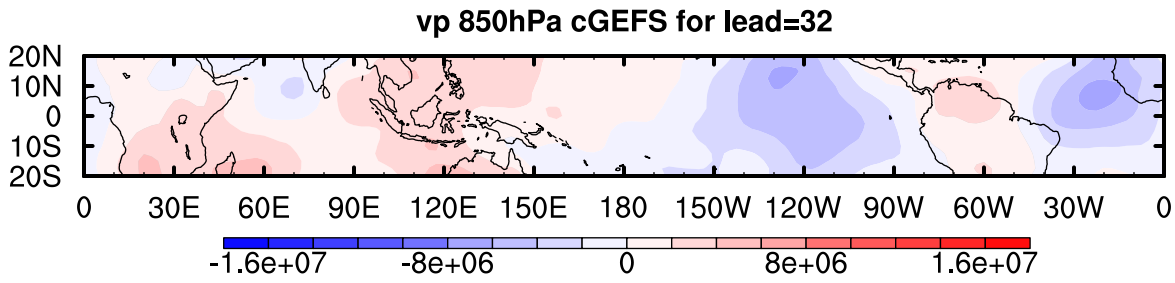
1.6e+07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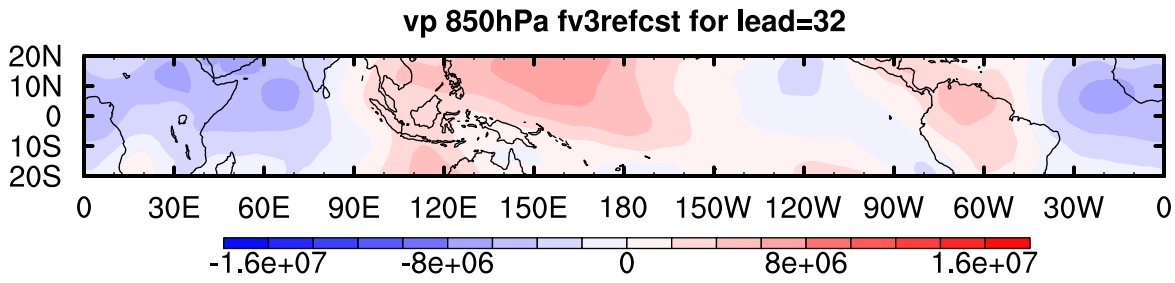
vp 850hPa fv3refcst for lead=32
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10S
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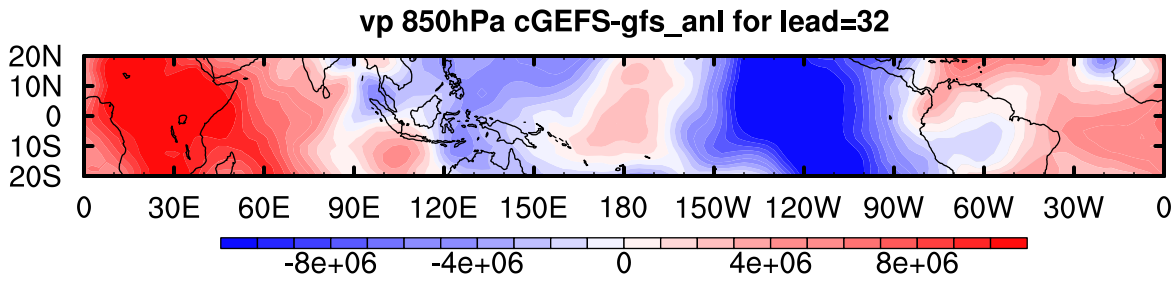
vp 850hPa cGEFS-gfs_anl for lead=32
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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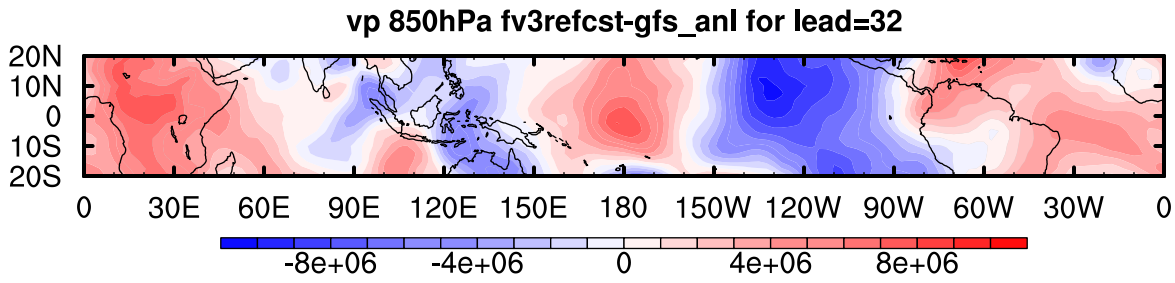
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=32
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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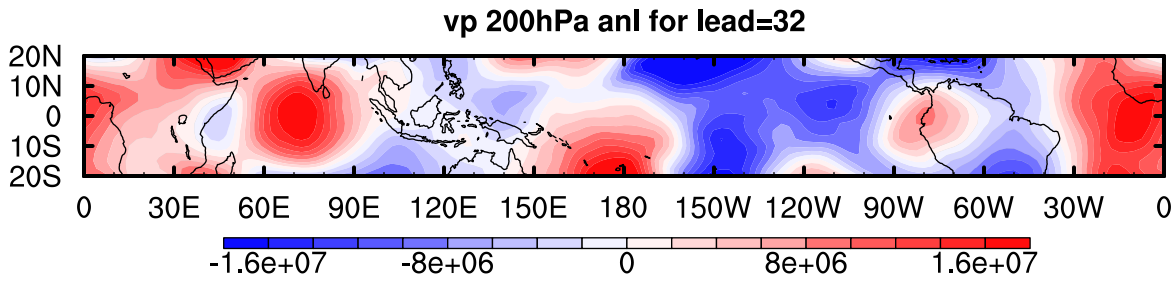
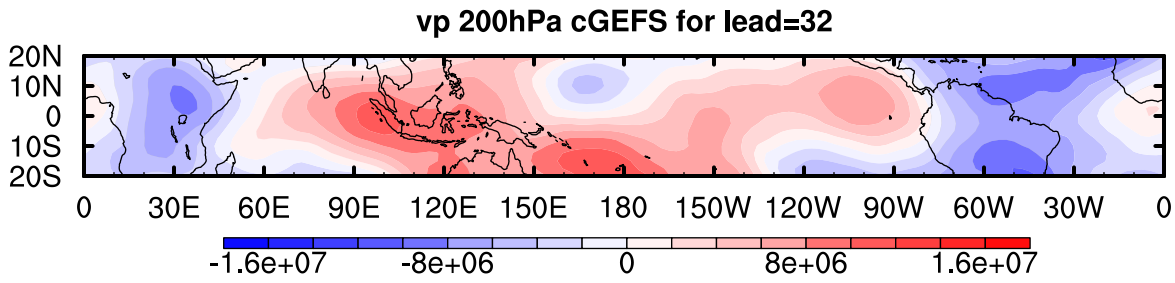
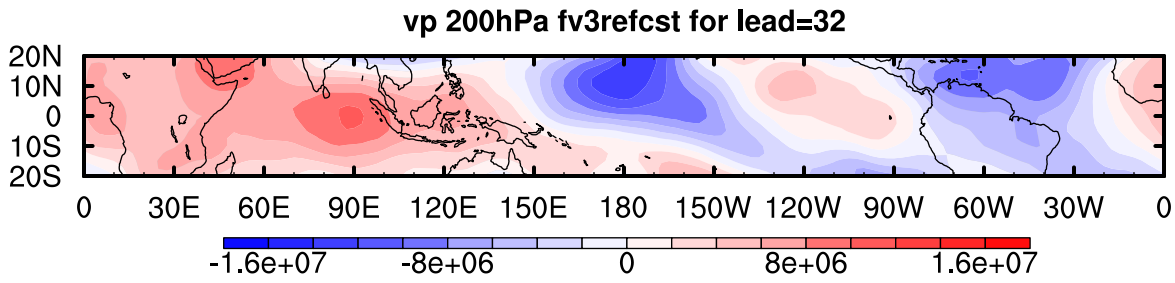
-4e+06
0
4e+06
8e+06


vp 200hPa anl for lead=32
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa cGEFS for lead=32
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 200hPa fv3refcst for lead=32
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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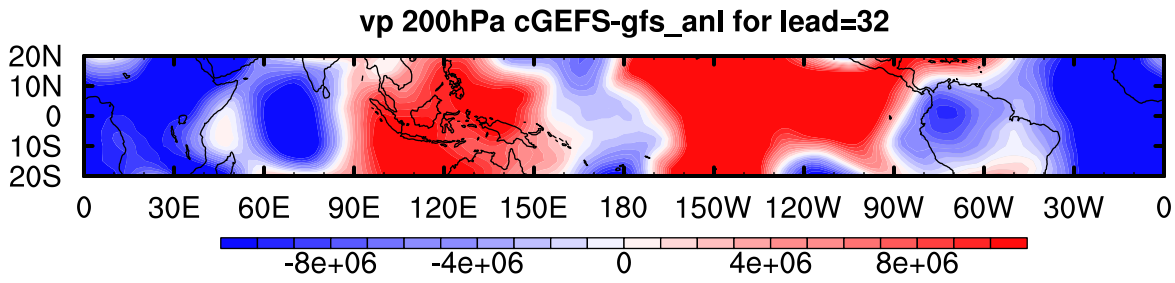
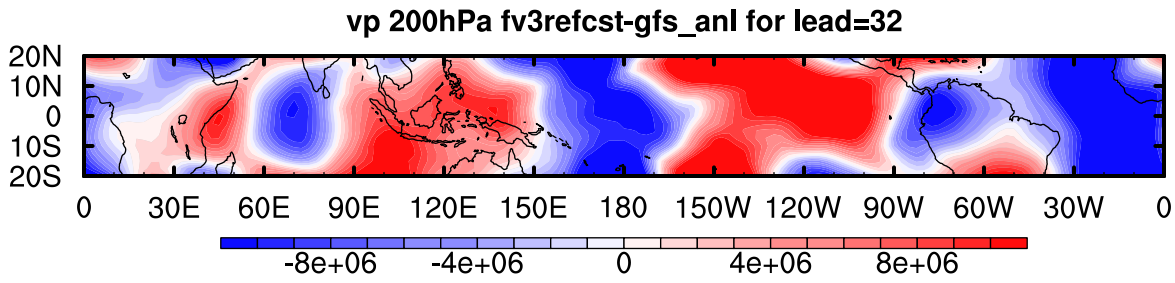
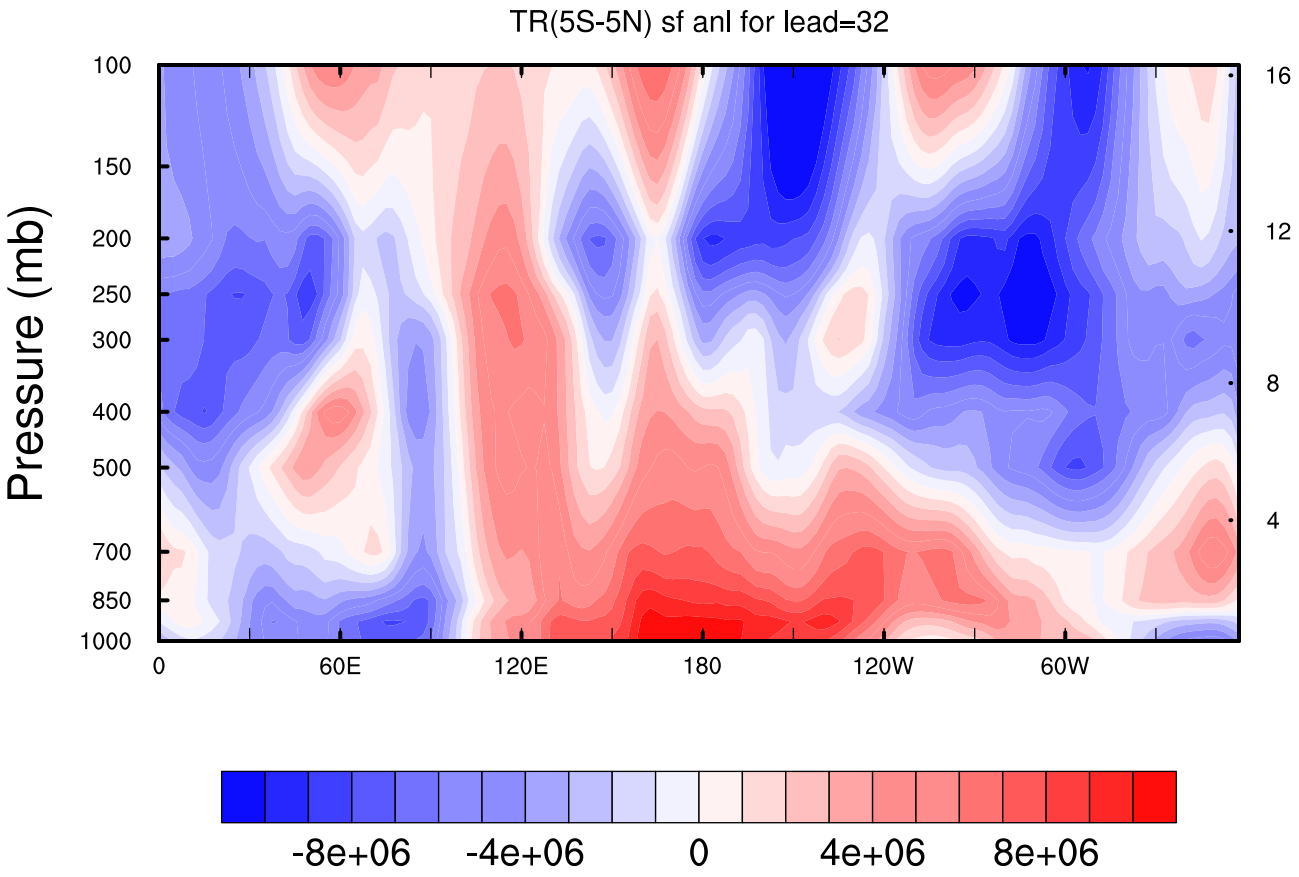
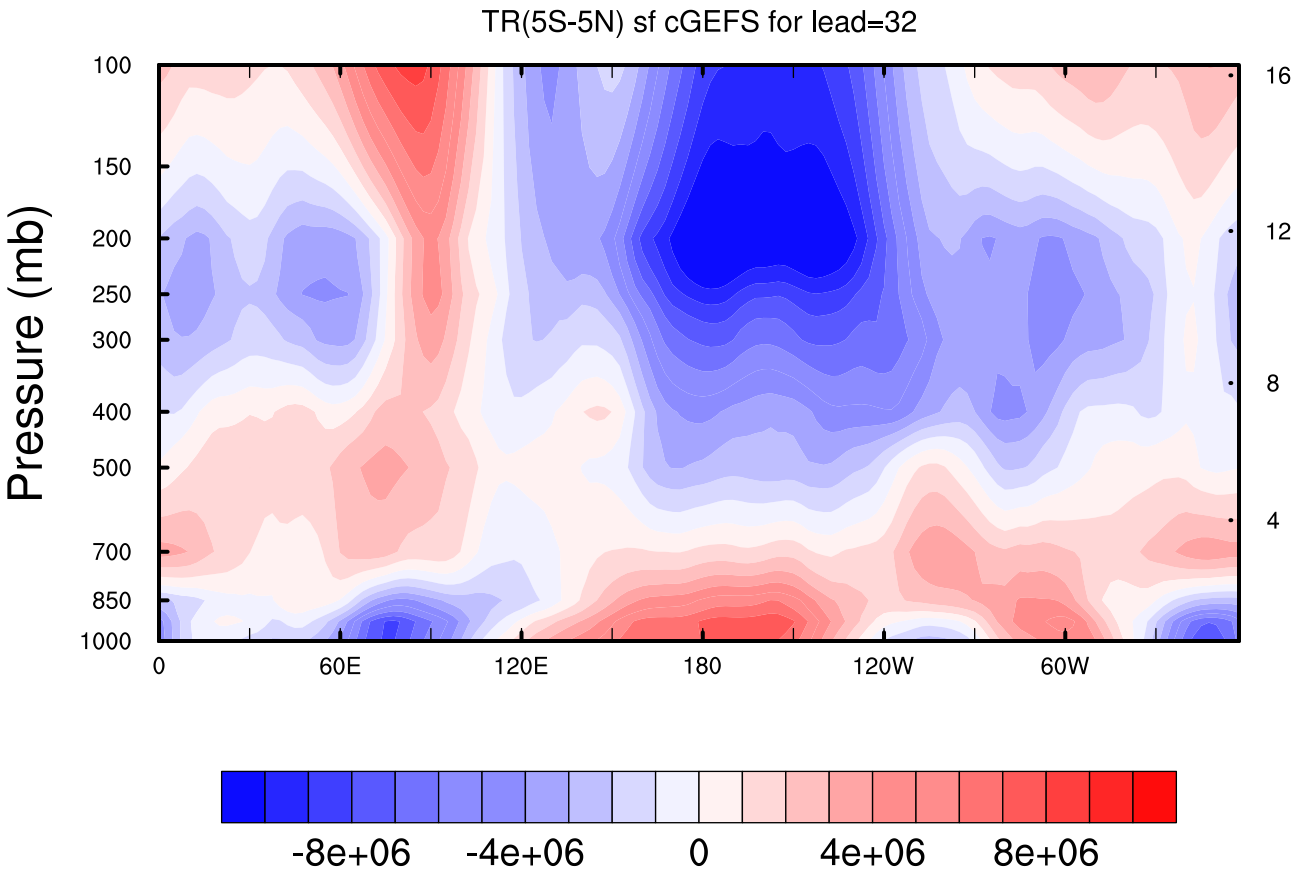
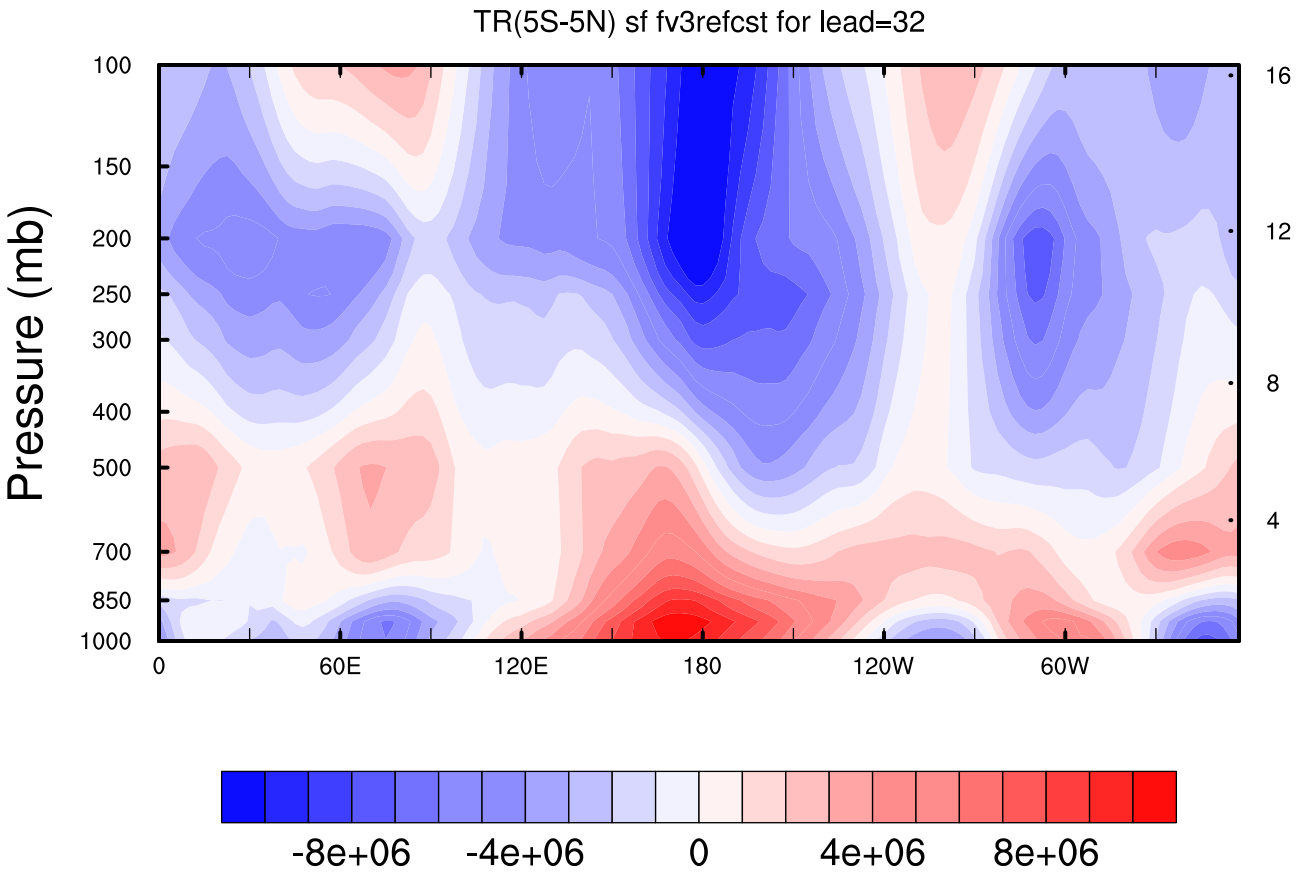
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

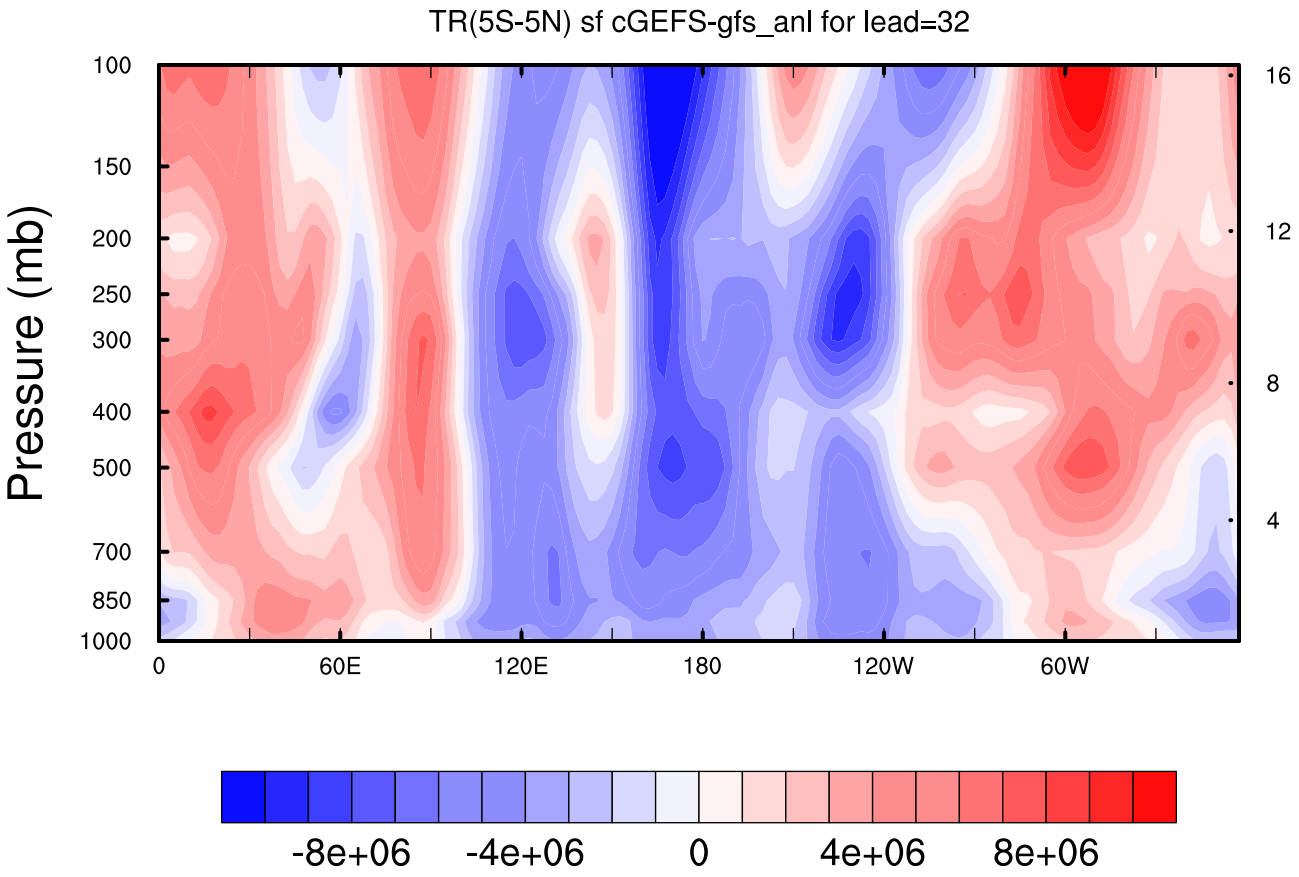

vp 200hPa cGEFS-gfs_anl for lead=32
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

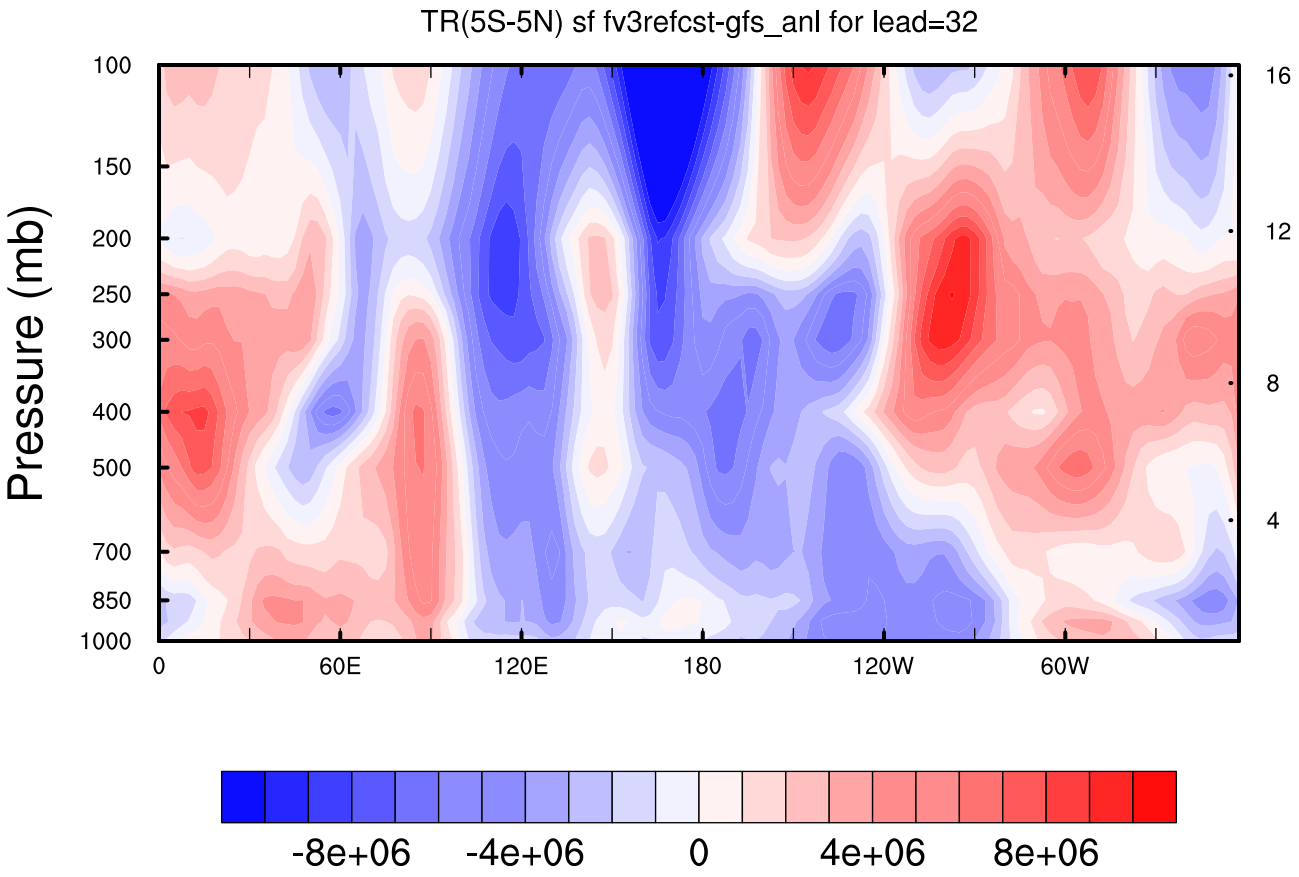

vp 200hPa fv3refcst-gfs_anl for lead=32
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

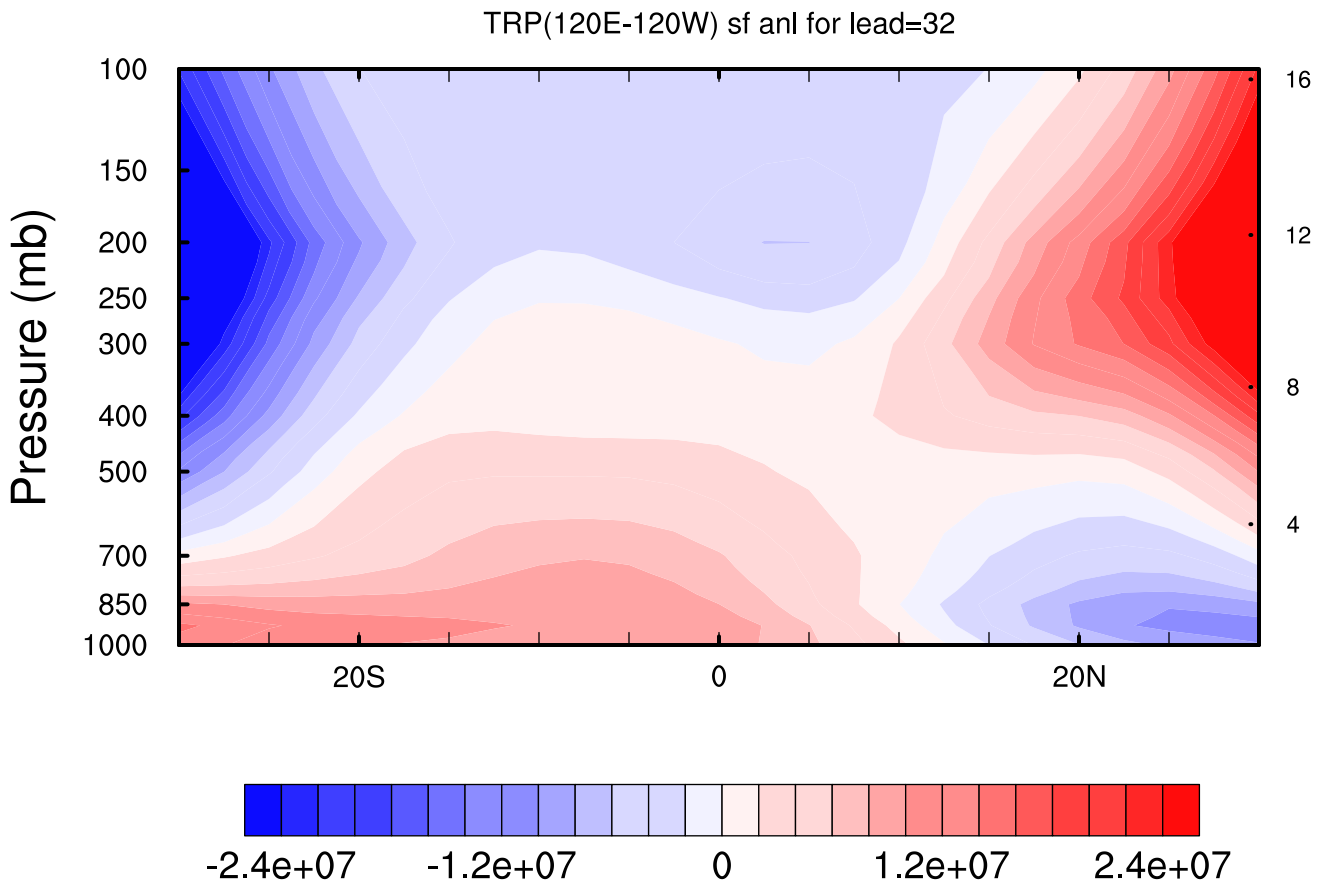

TR(5S-5N) sf anl for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

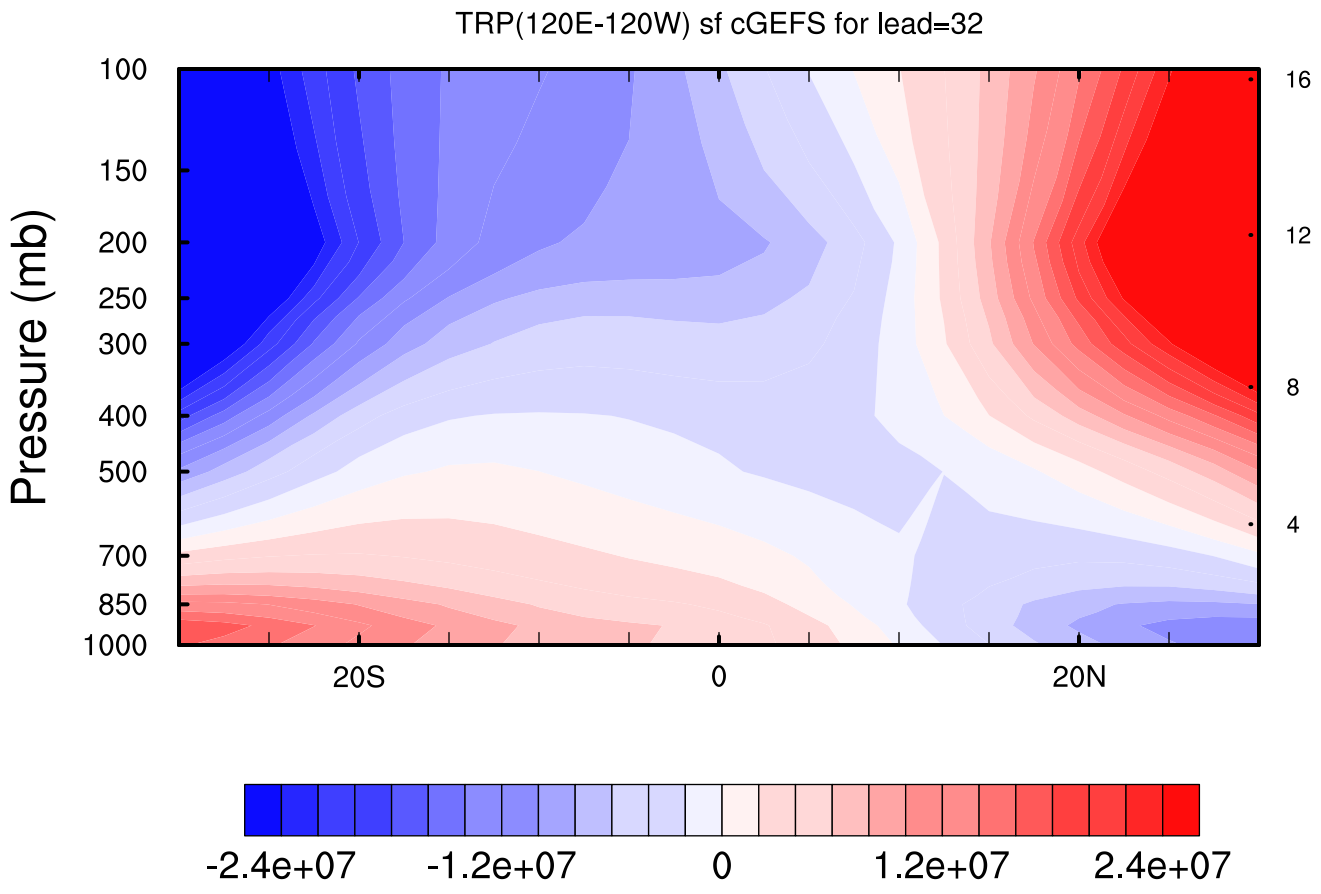

TR(5S-5N) sf cGEFS for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

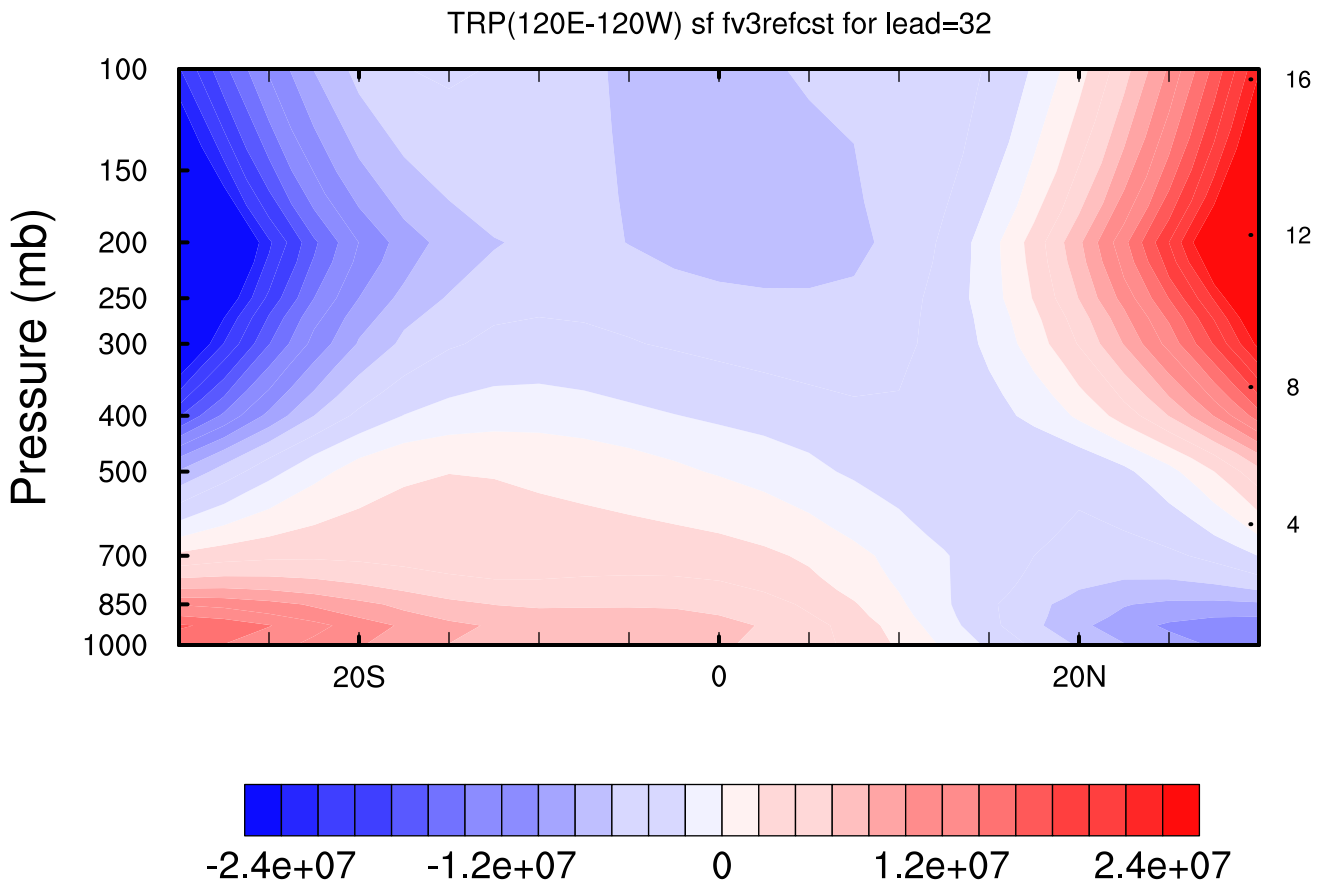

TR(5S-5N) sf fv3refcst for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

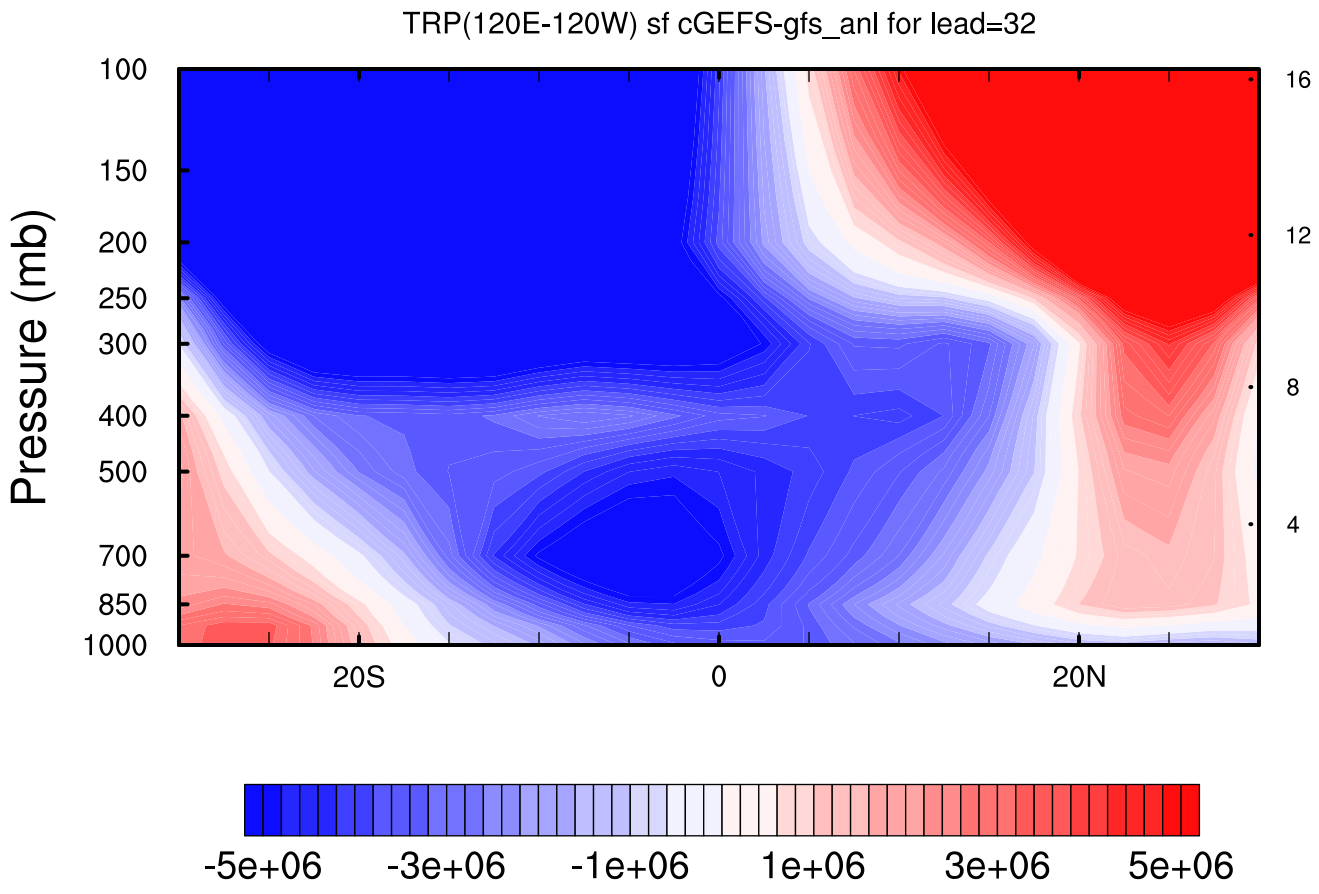

TR(5S-5N) sf cGEFS-gfs_anl for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

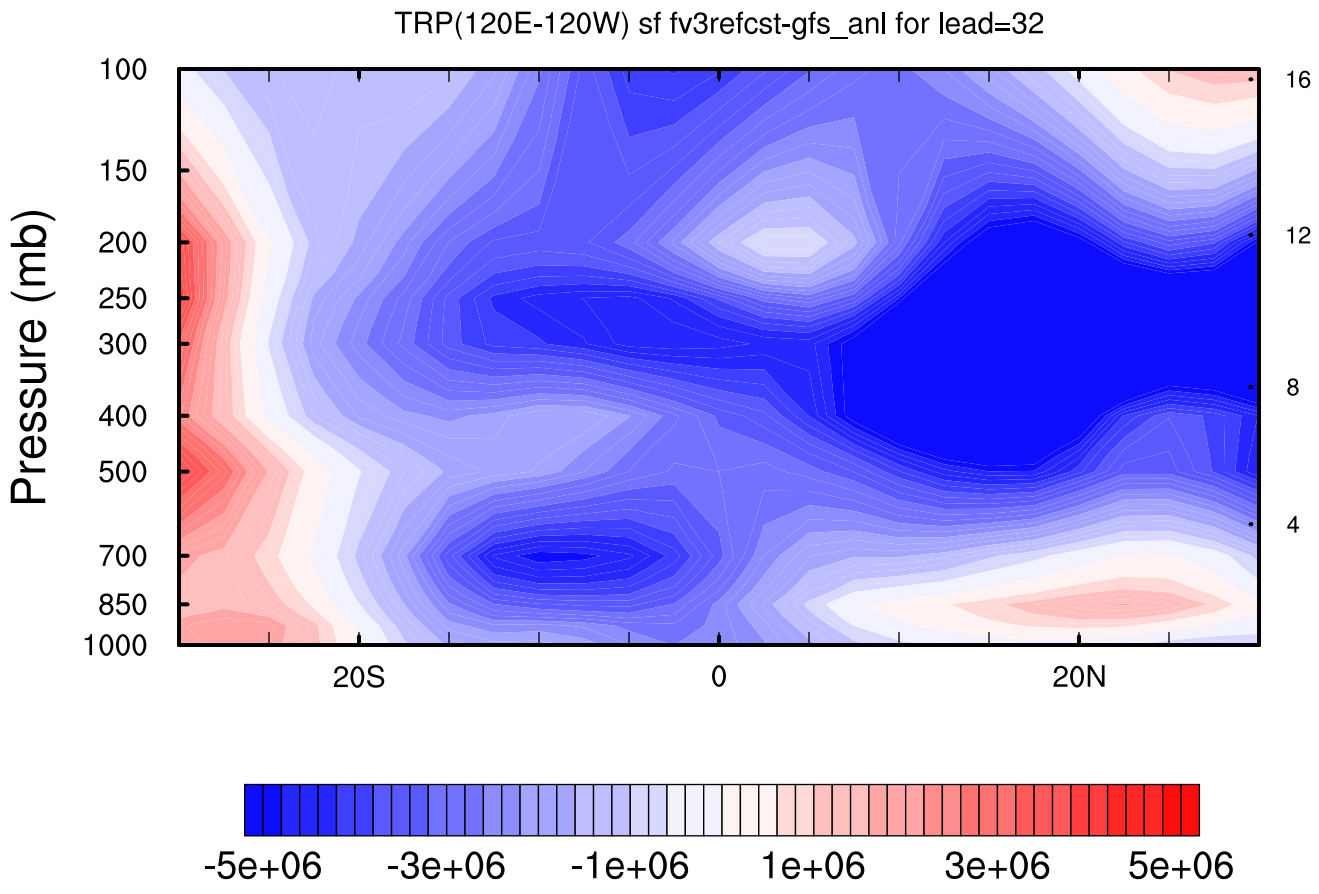

TR(5S-5N) sf fv3refcst-gfs_anl for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

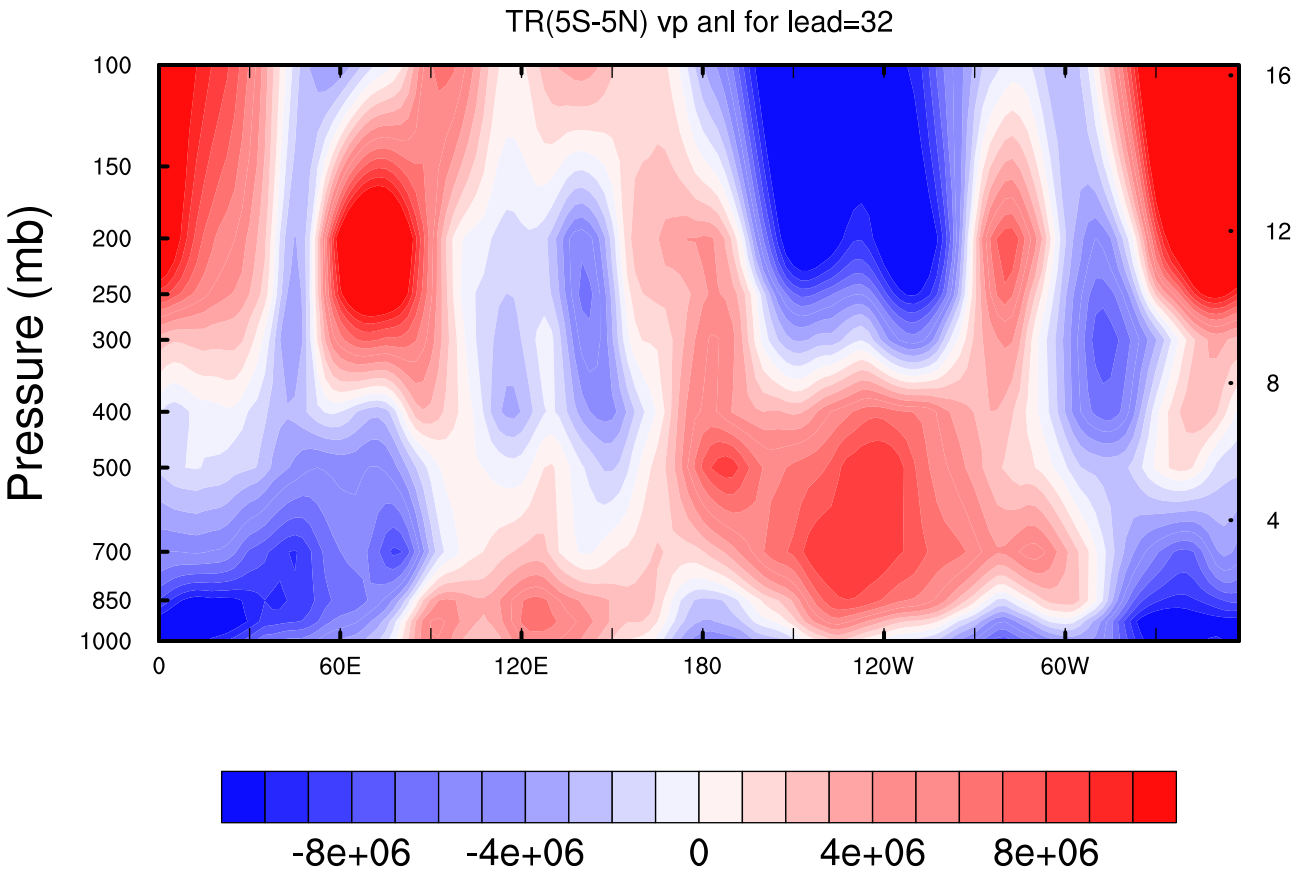

TRP(120E-120W) sf anl for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

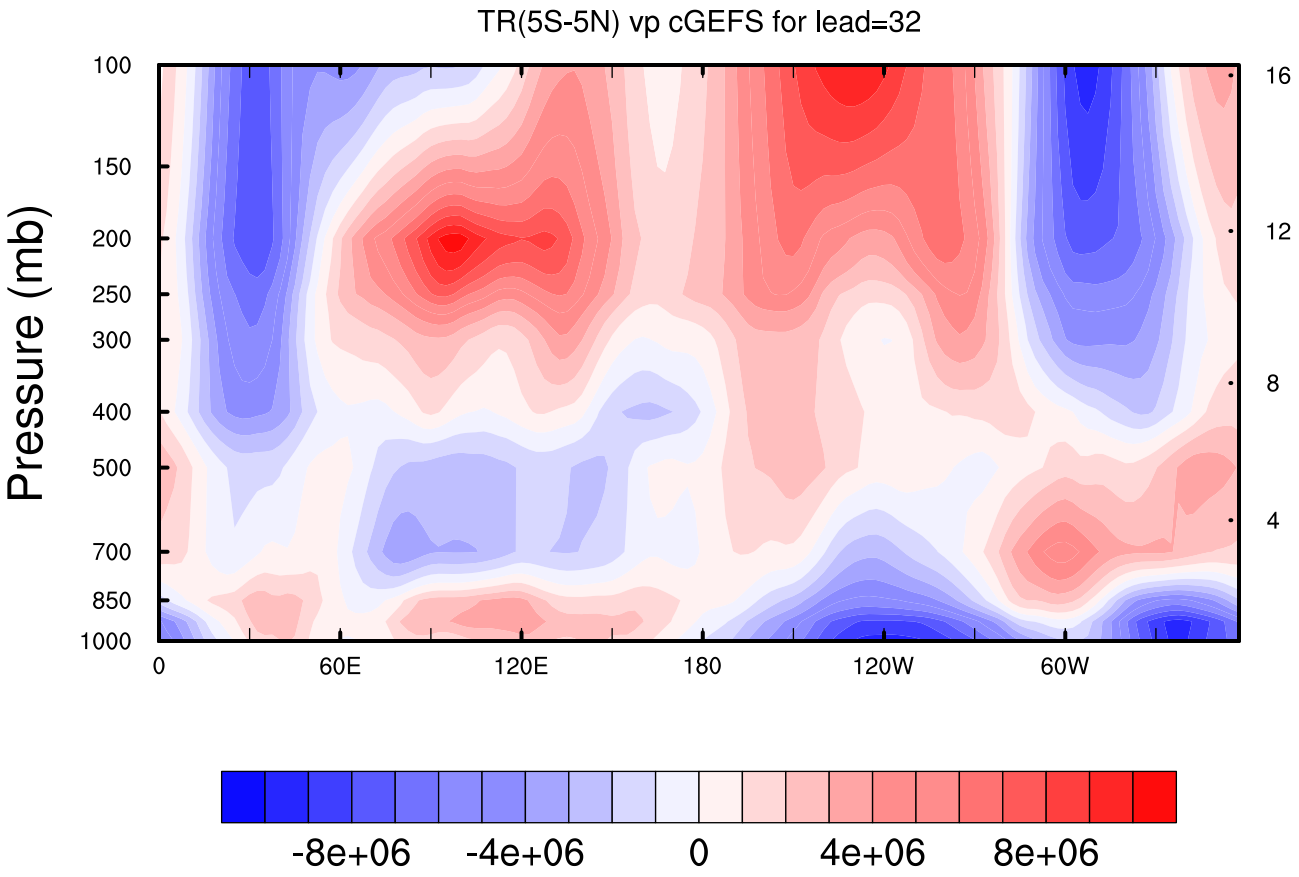

TRP(120E-120W) sf cGEFS for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

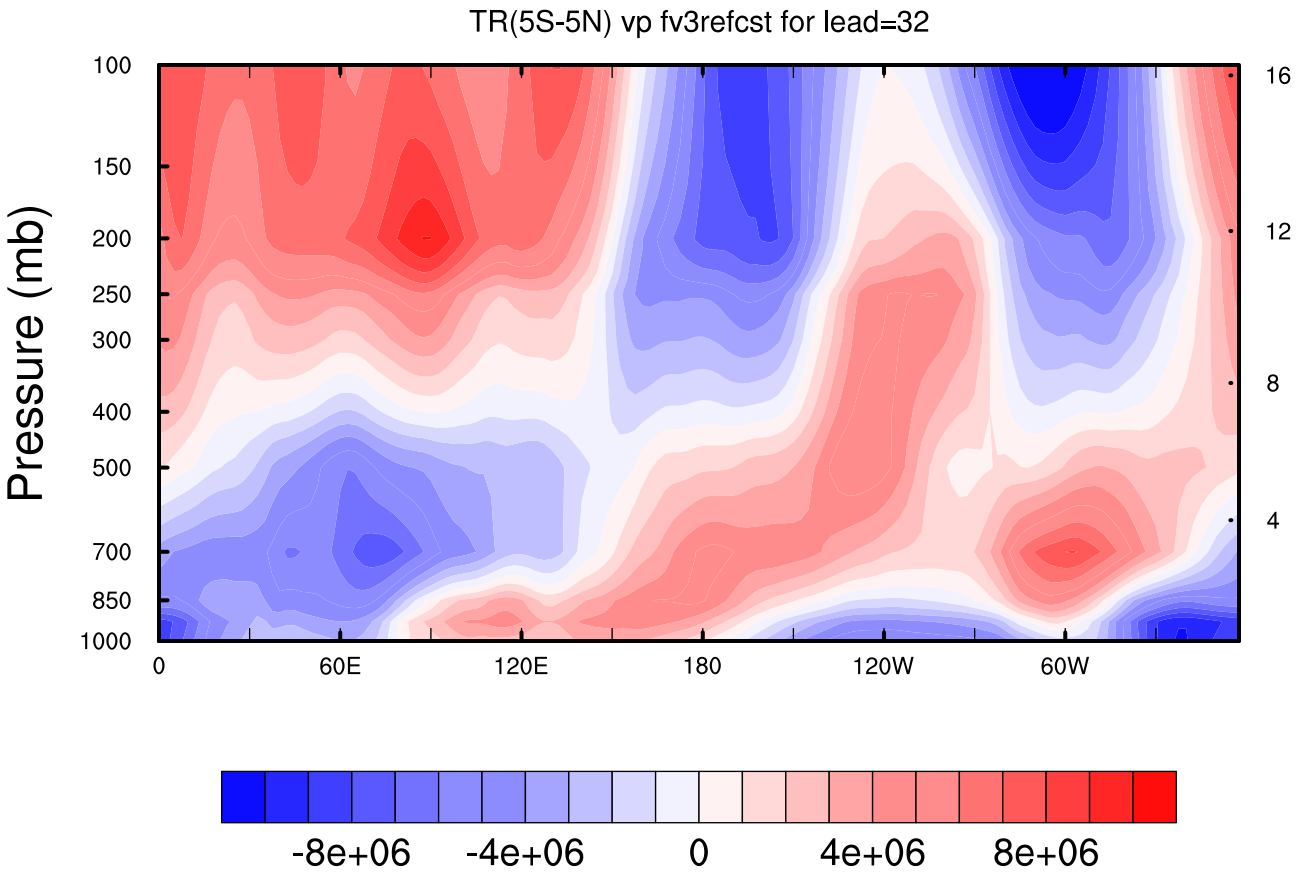

TRP(120E-120W) sf fv3refcst for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

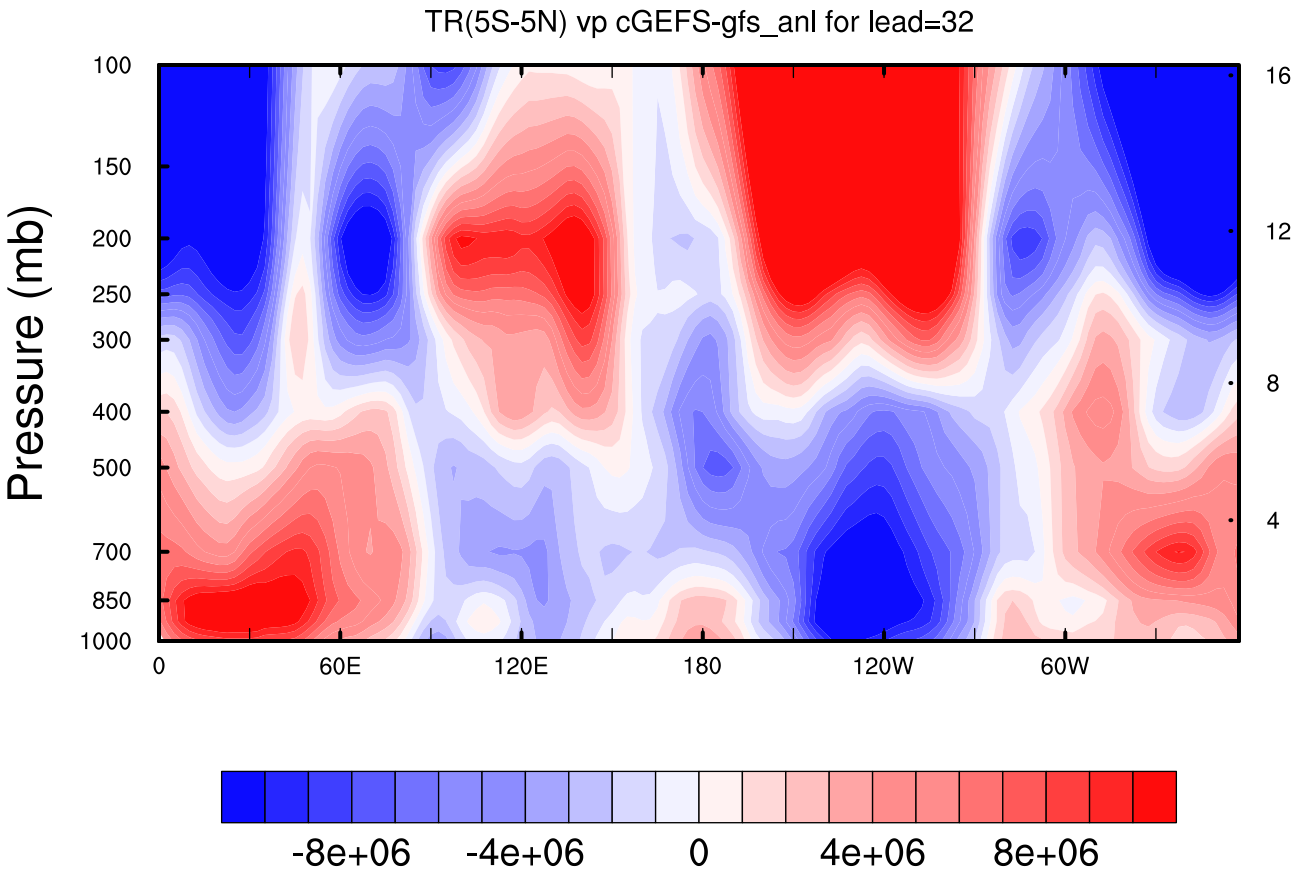

TRP(120E-120W) sf cGEFS-gfs_anl for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

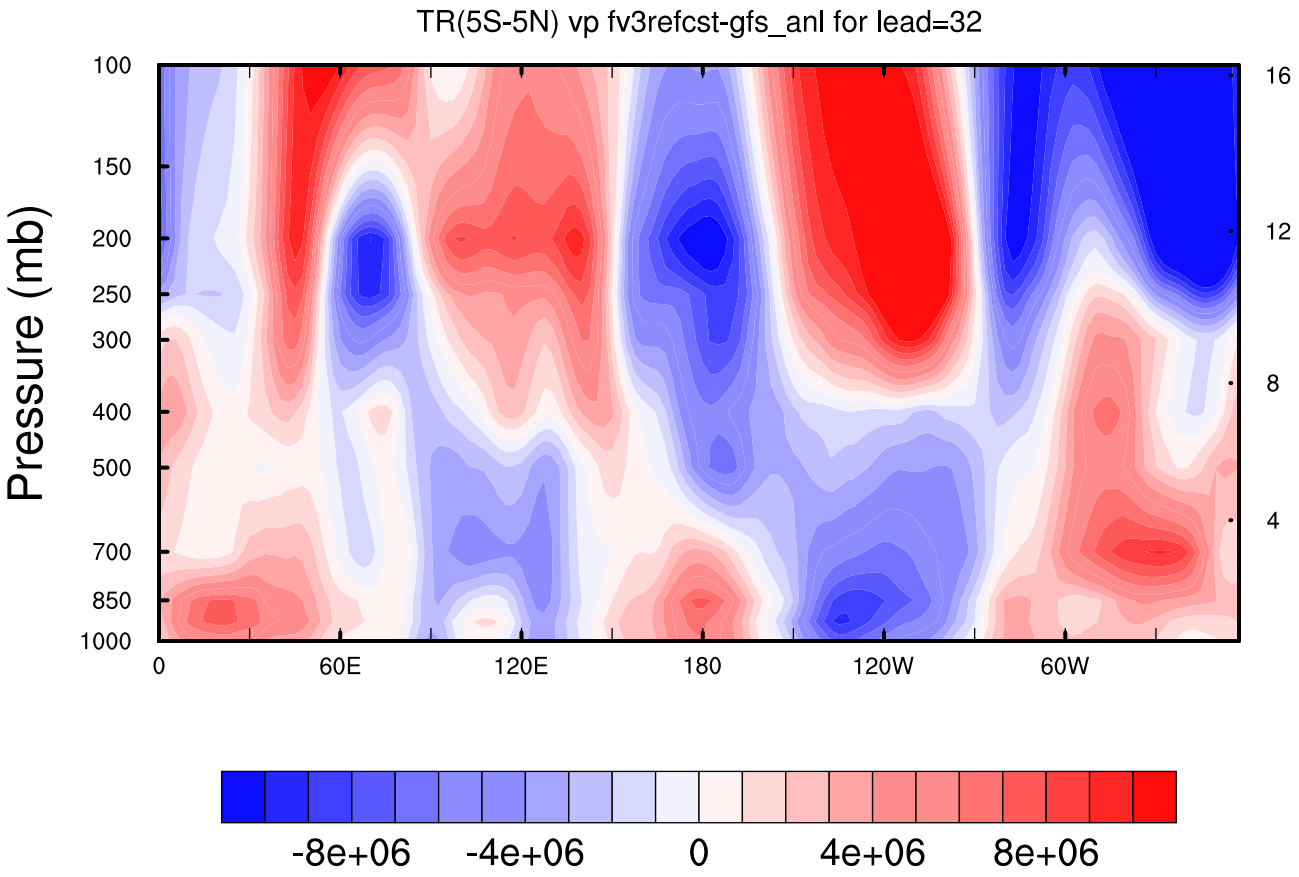

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

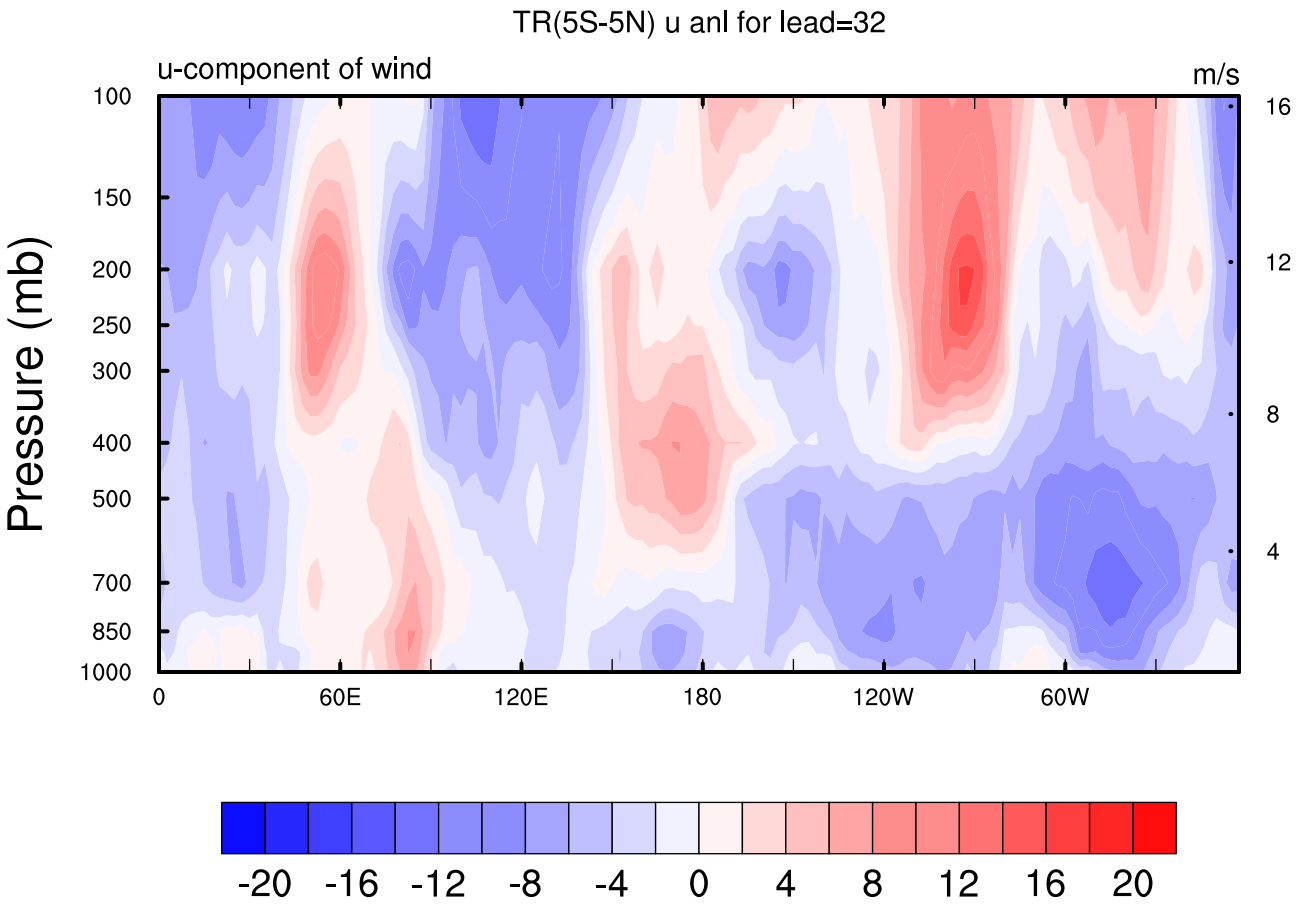

TR(5S-5N) vp anl for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

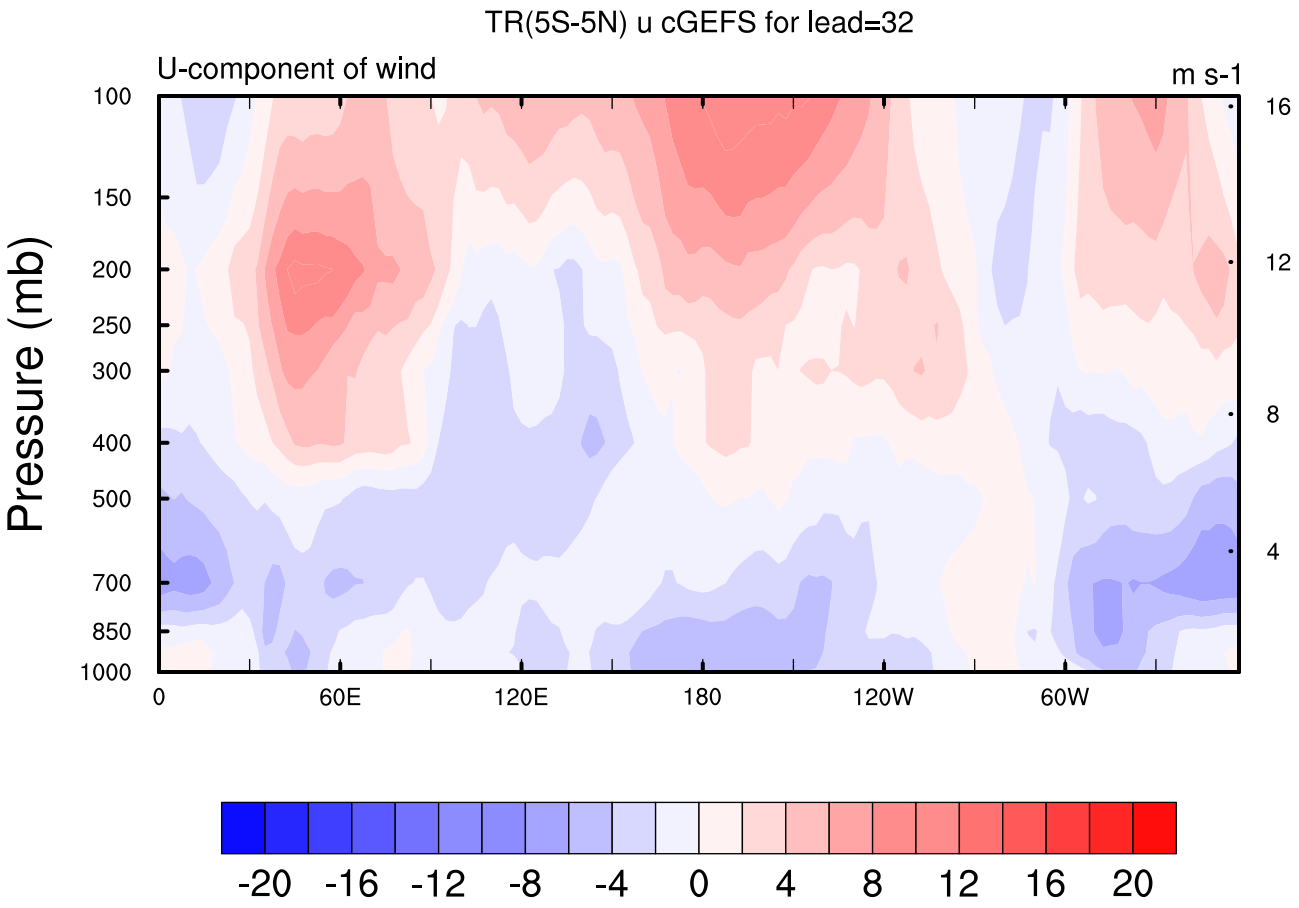

TR(5S-5N) vp cGEFS for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

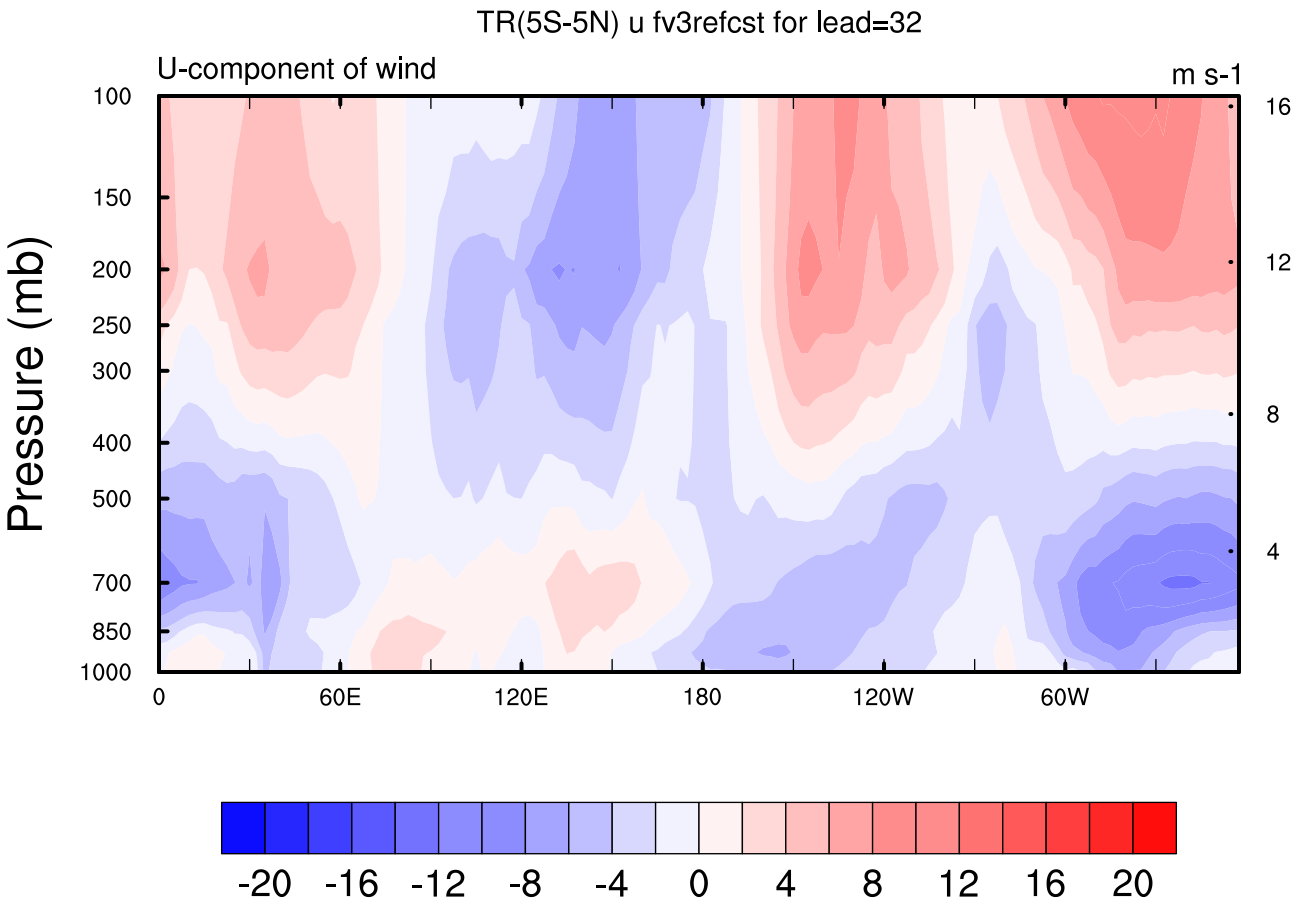

TR(5S-5N) vp fv3refcst for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

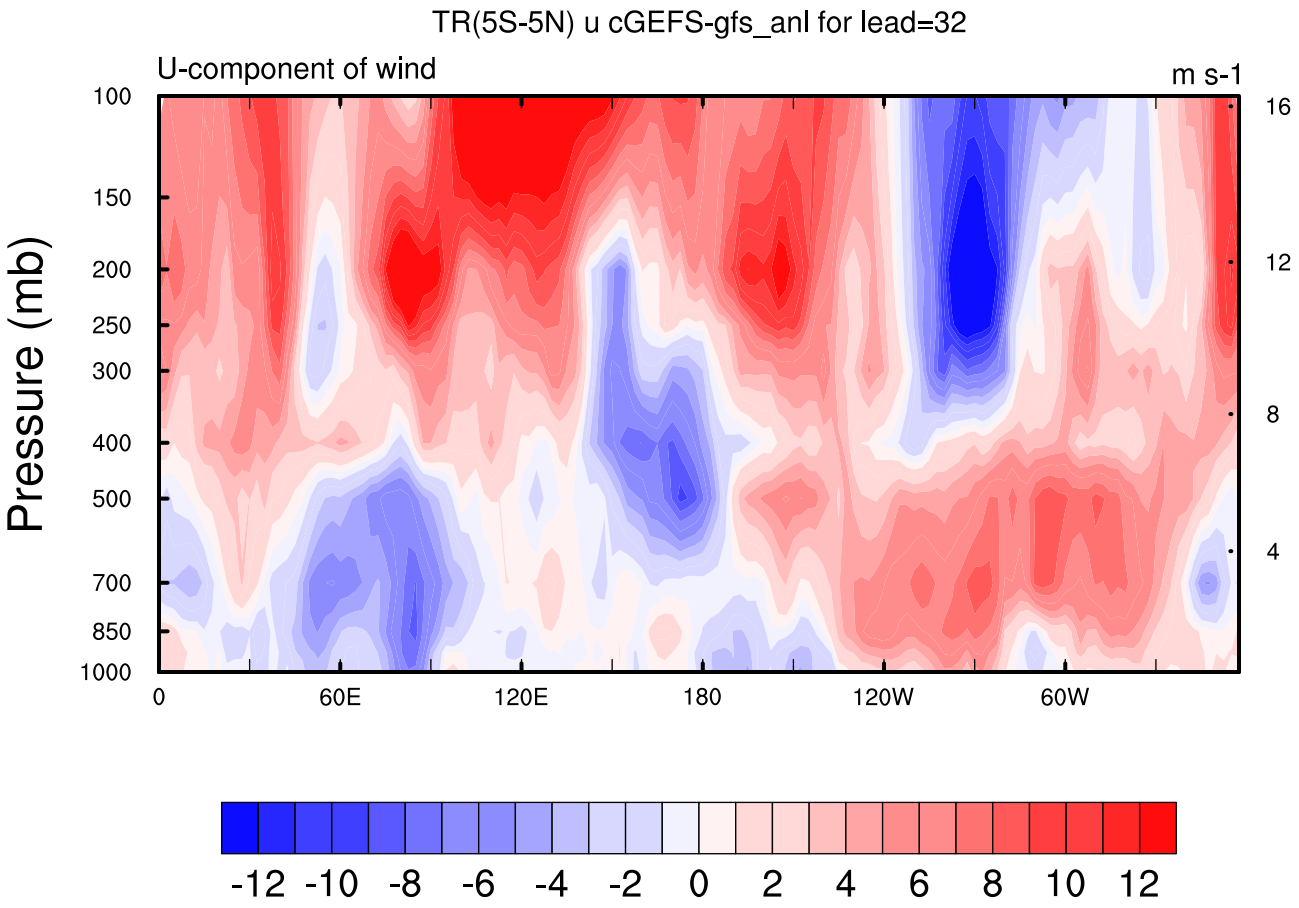

TR(5S-5N) vp cGEFS-gfs_anl for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

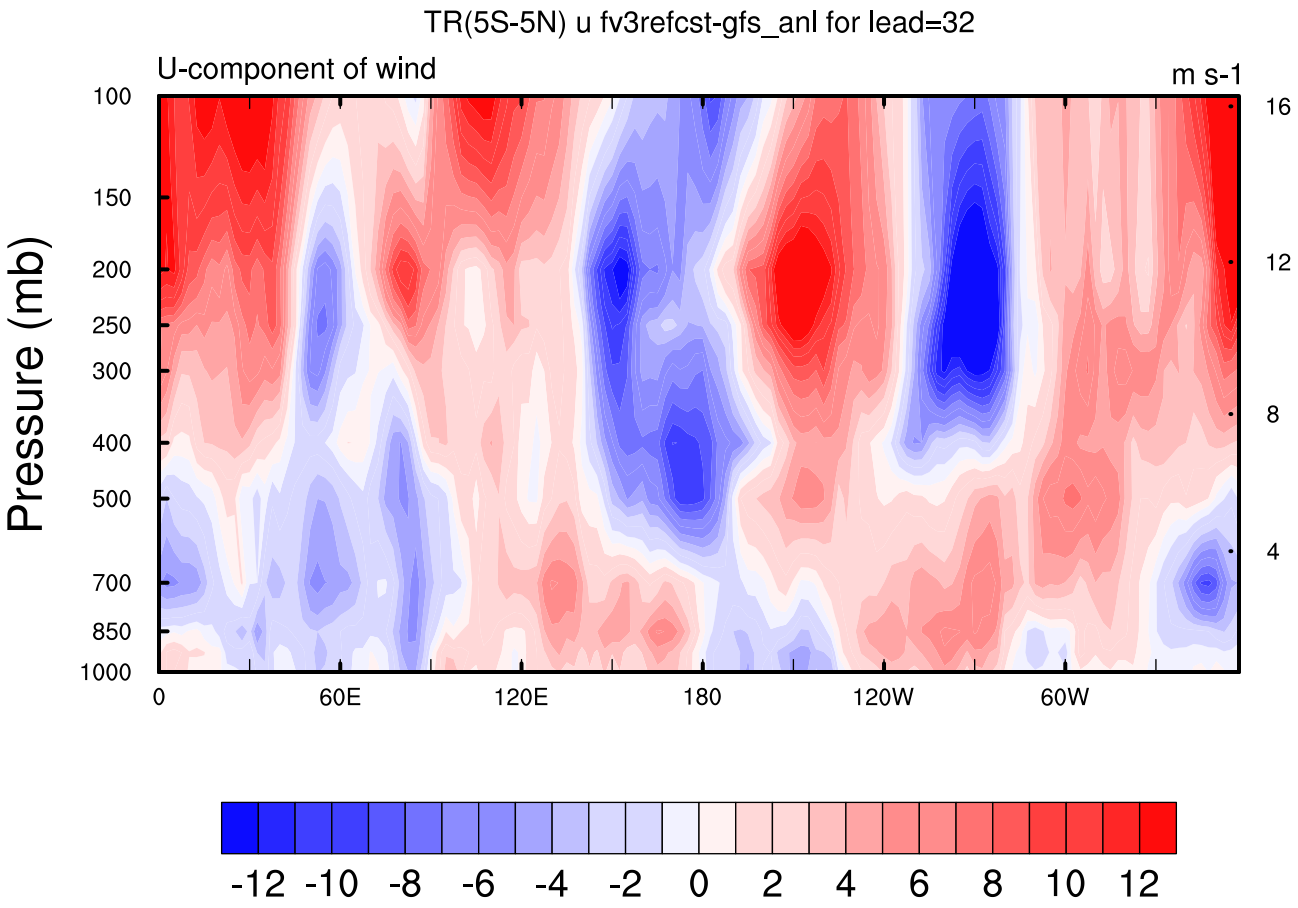

TR(5S-5N) vp fv3refcst-gfs_anl for lead=32
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

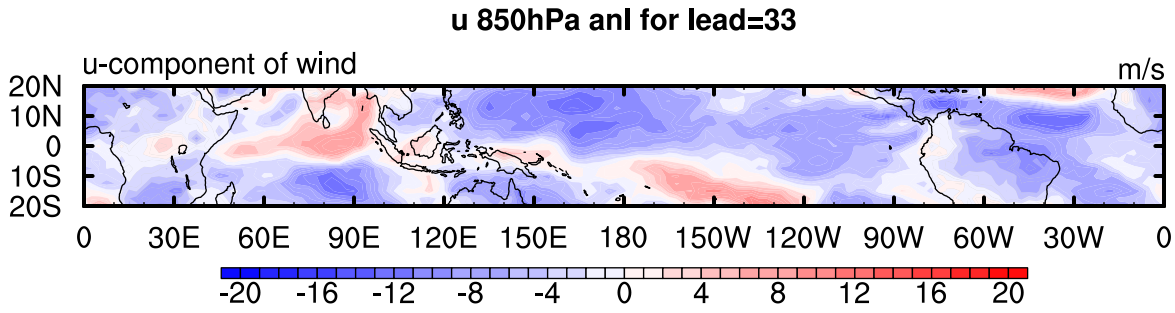

TR(5S-5N) u anl for lead=32
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

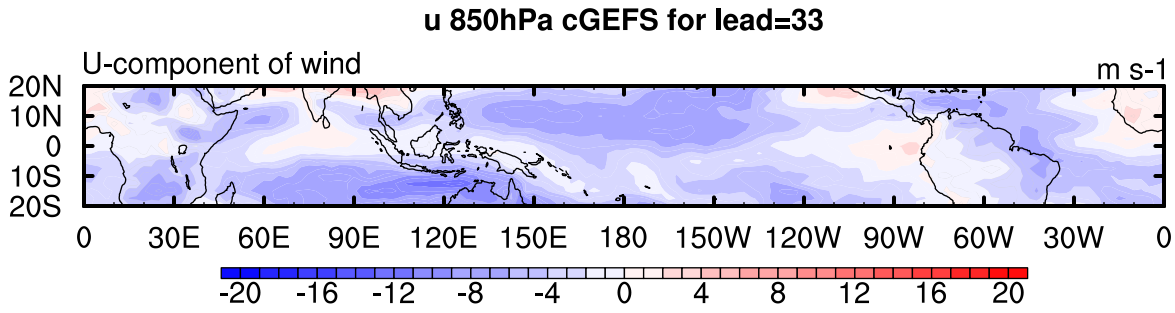

TR(5S-5N) u cGEFS for lead=32
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

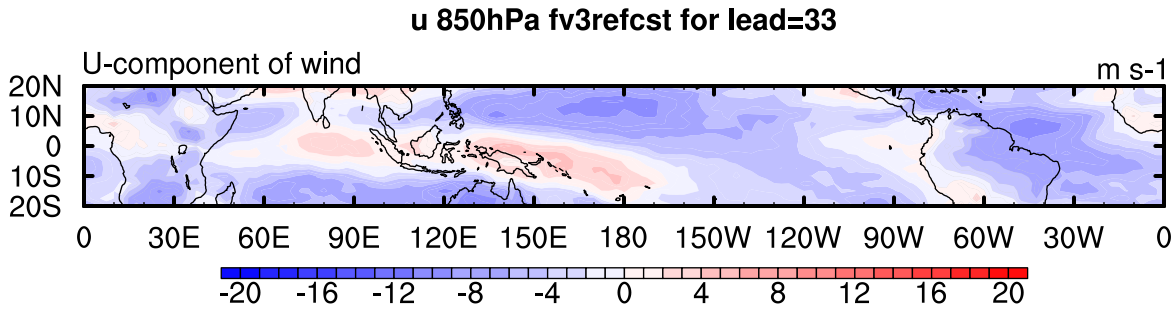

TR(5S-5N) u fv3refcst for lead=32
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

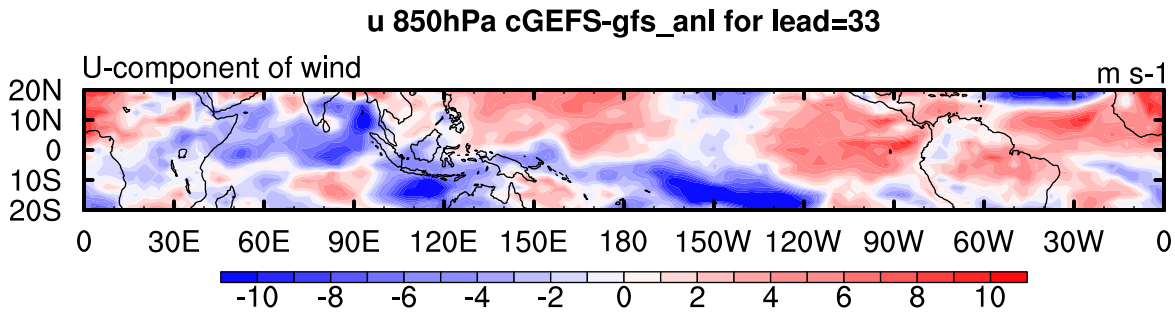

TR(5S-5N) u cGEFS-gfs_anl for lead=32
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

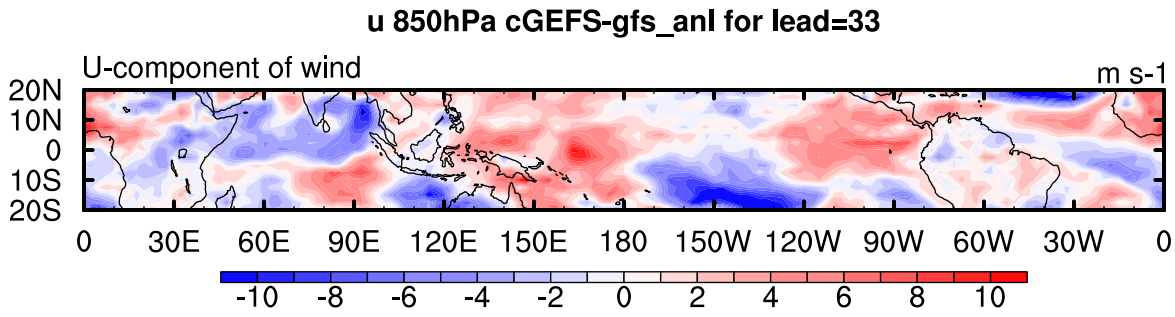

TR(5S-5N) u fv3refcst-gfs_anl for lead=32
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

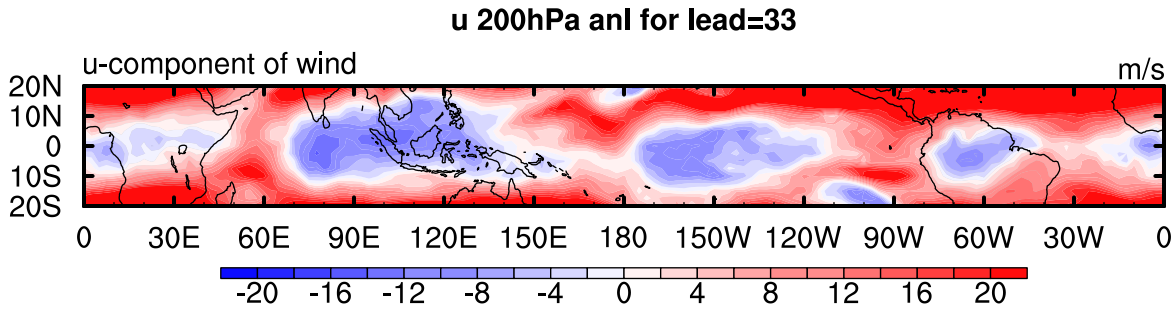

u 850hPa anl for lead=33
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

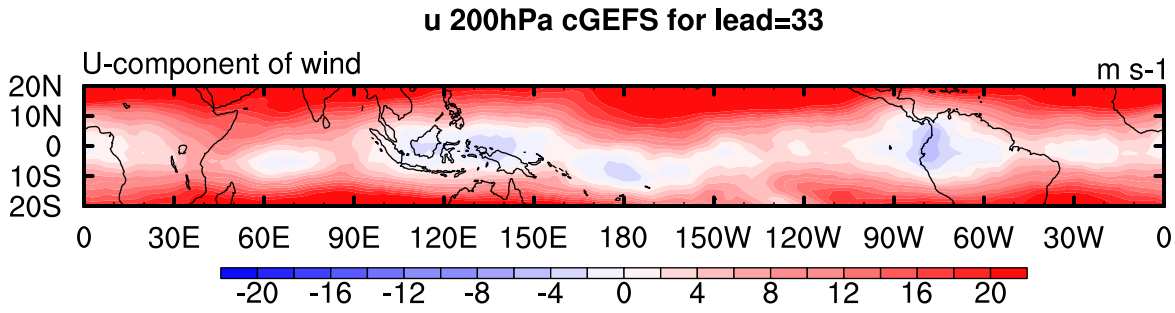

u 850hPa cGEFS for lead=33
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

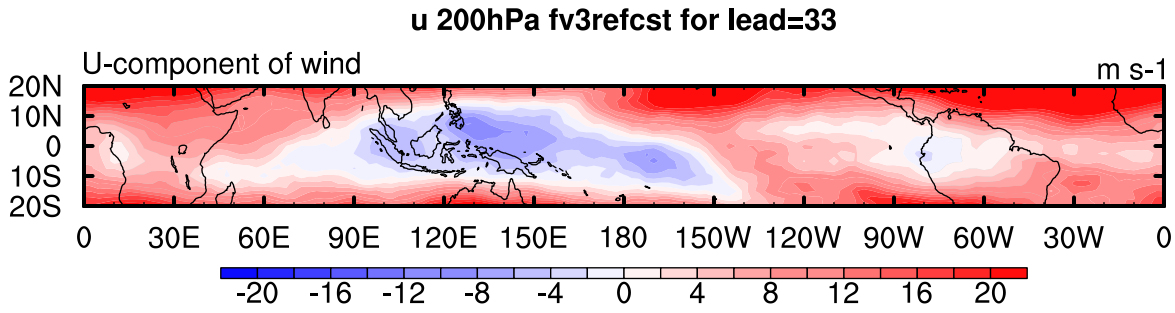

u 850hPa fv3refcst for lead=33
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

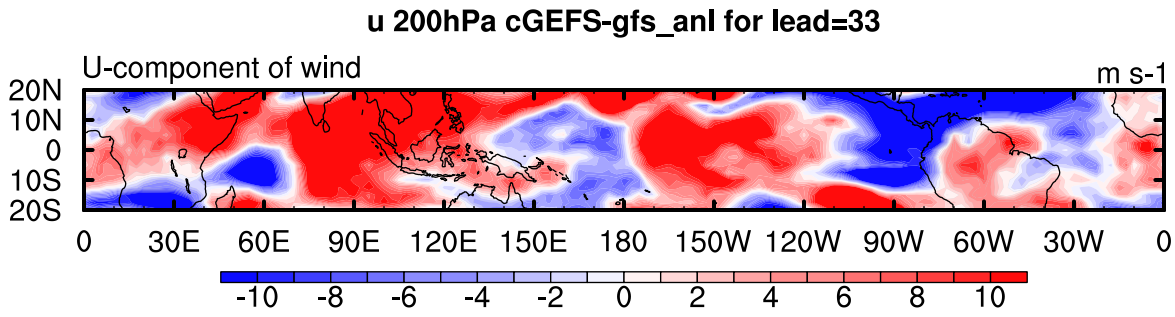

u 850hPa cGEFS-gfs_anl for lead=33
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

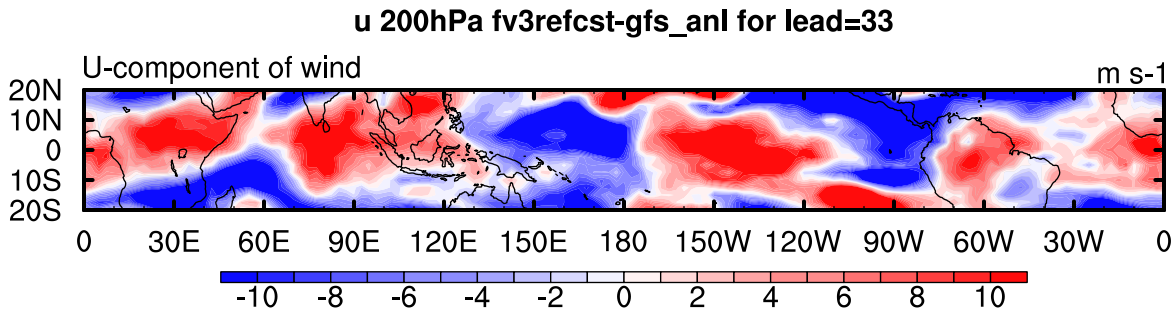

u 850hPa cGEFS-gfs_anl for lead=33
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

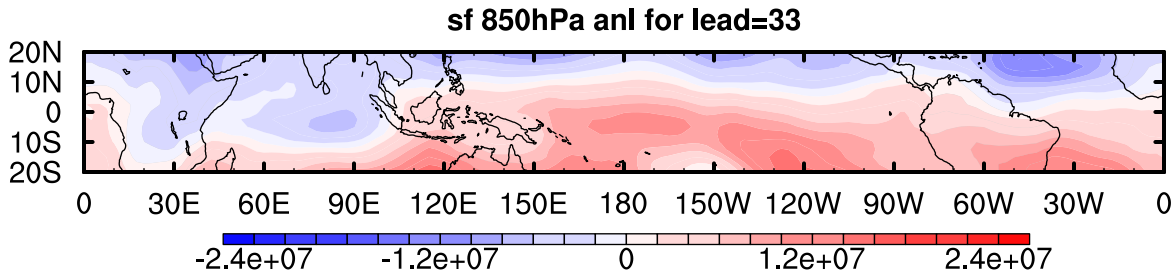

u 200hPa anl for lead=33
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

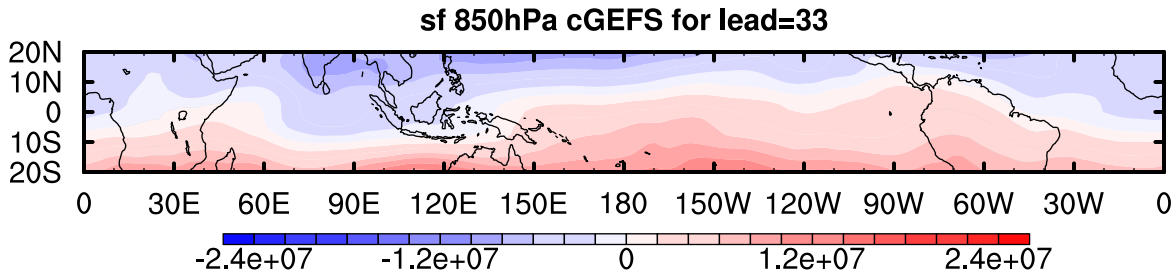

u 200hPa cGEFS for lead=33
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

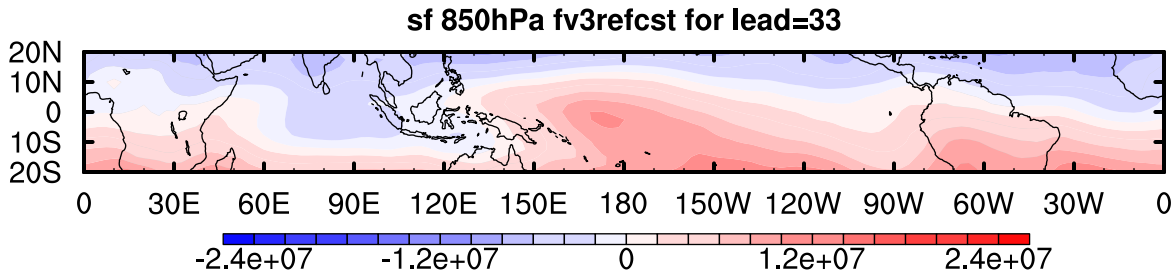

u 200hPa fv3refcst for lead=33
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

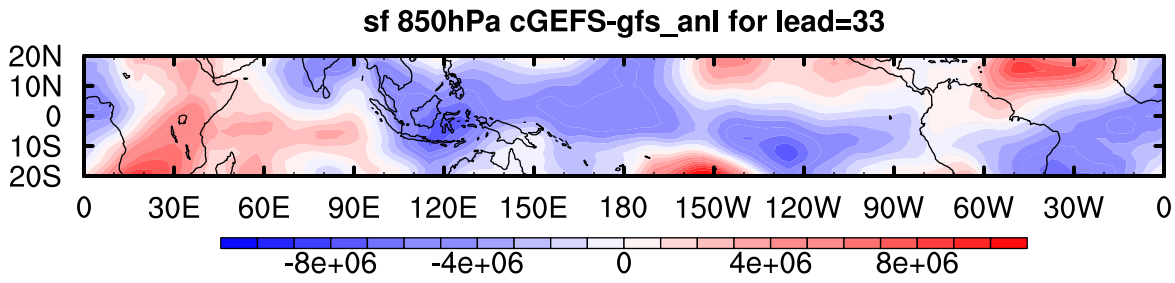

u 200hPa cGEFS-gfs_anl for lead=33
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

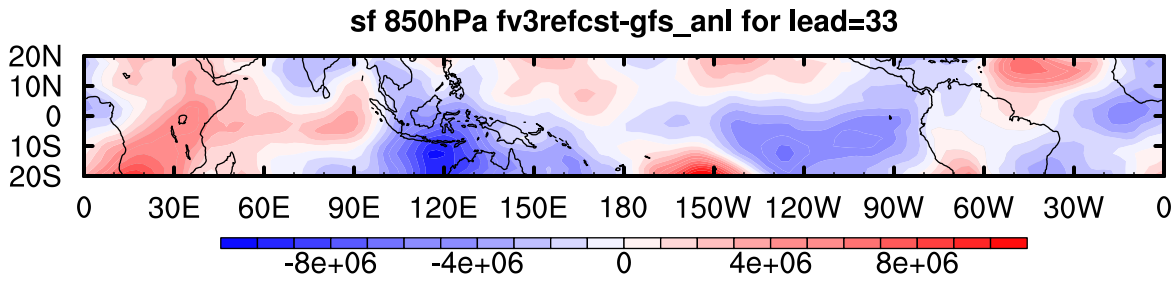

u 200hPa fv3refcst-gfs_anl for lead=33
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

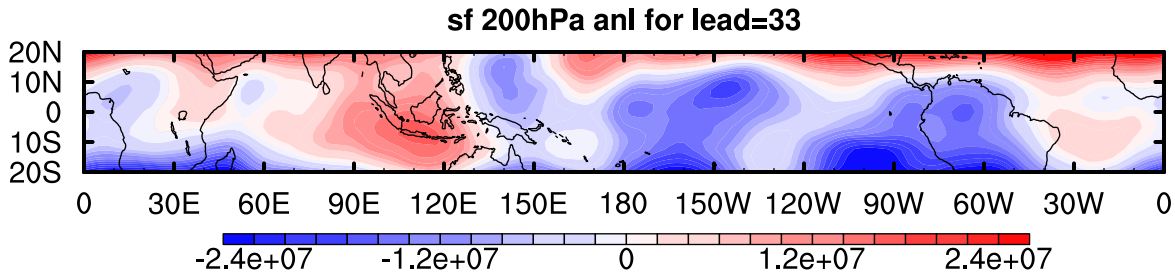

sf 850hPa anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

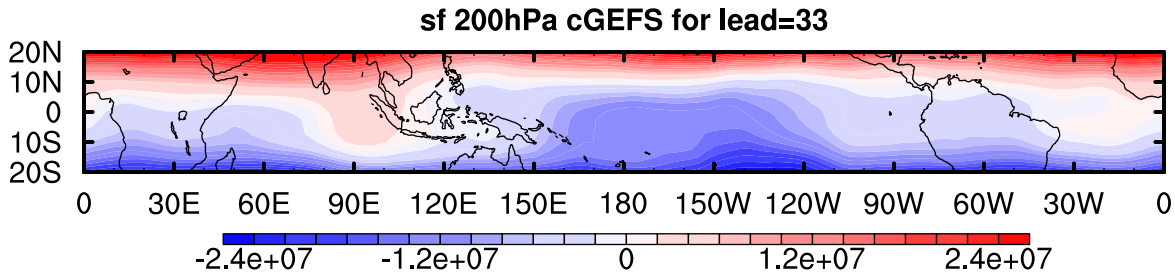

sf 850hPa cGEFS for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

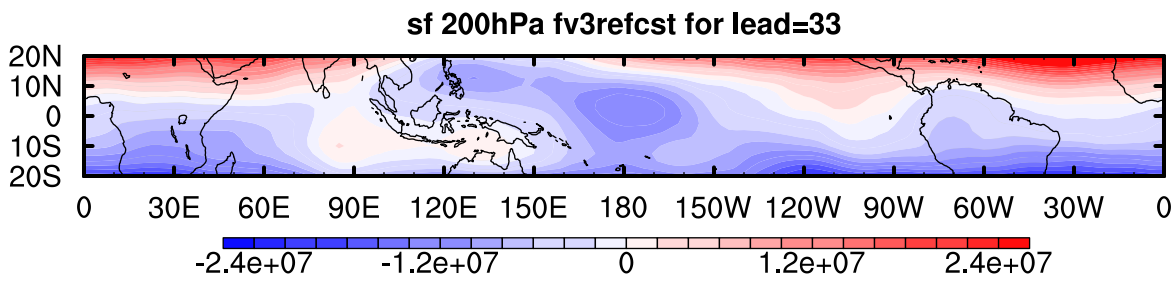

sf 850hPa fv3refcst for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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30W
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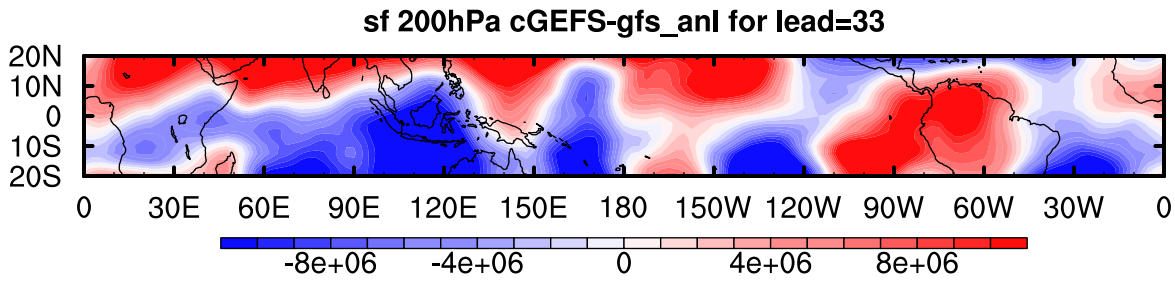
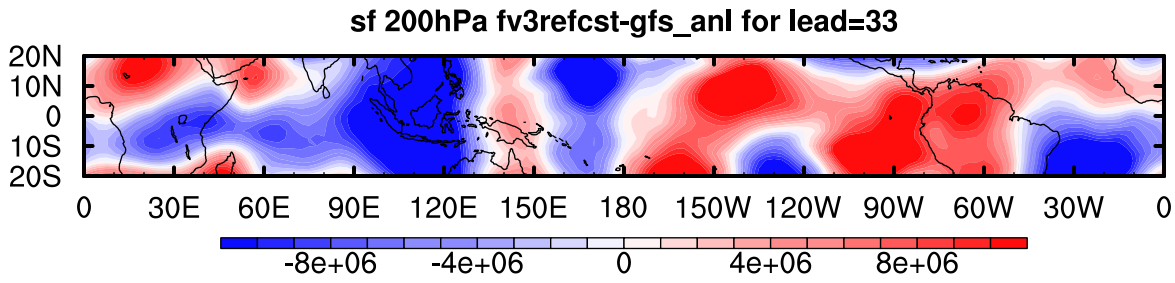
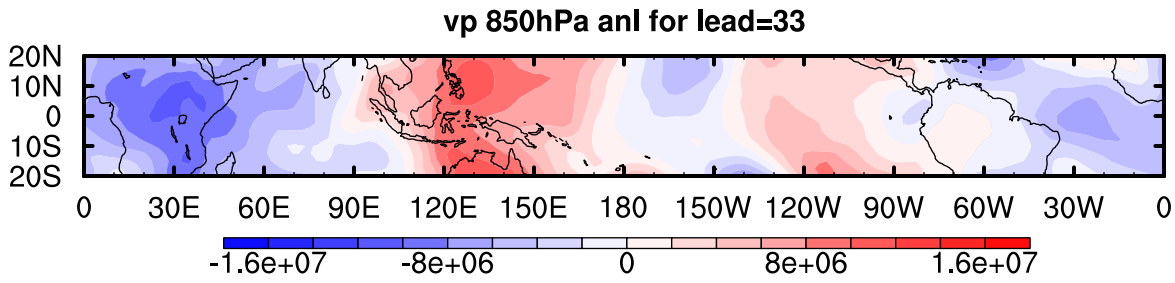
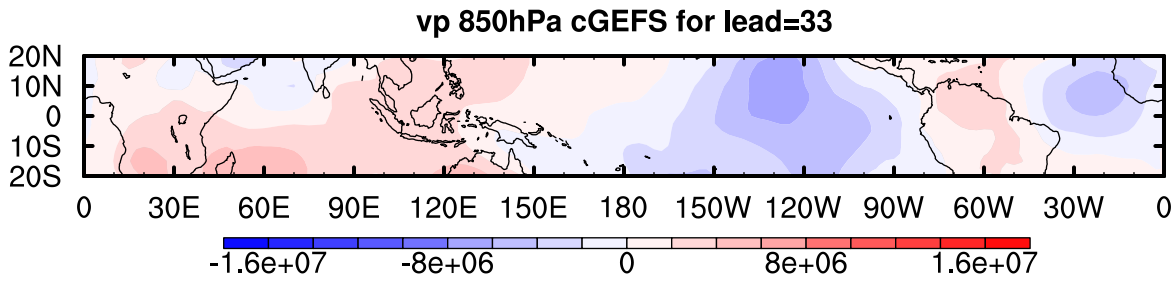
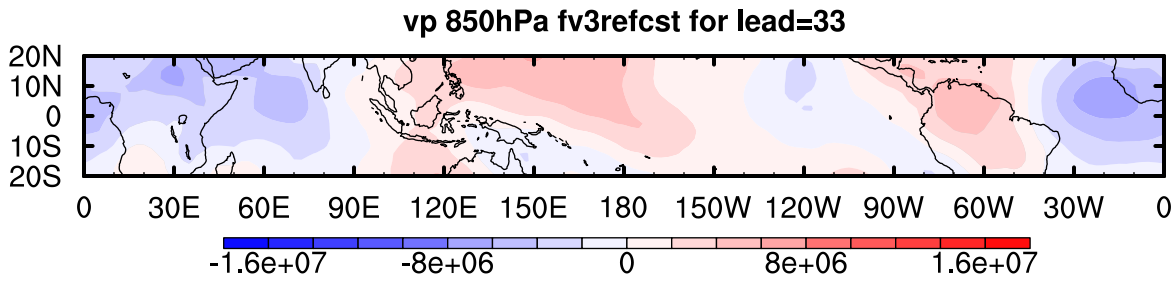
0
1.2e+07
2.4e+07

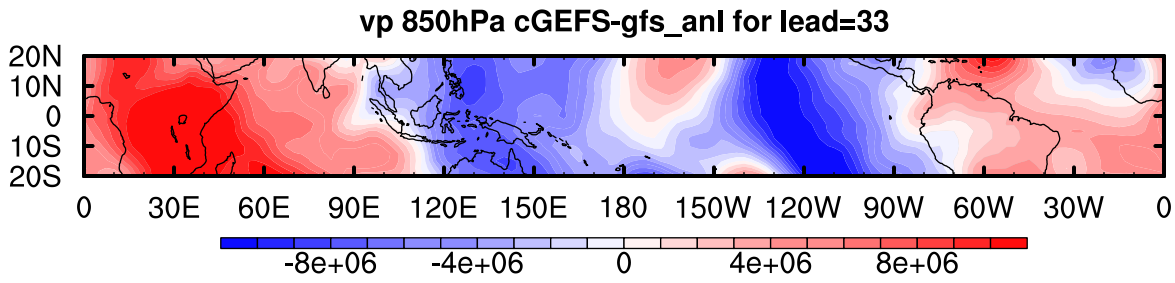

sf 200hPa cGEFS-gfs_anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

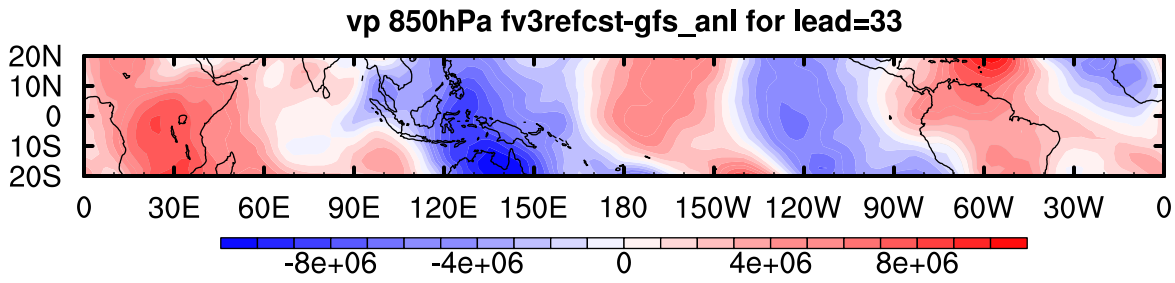

sf 200hPa fv3refcst-gfs_anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

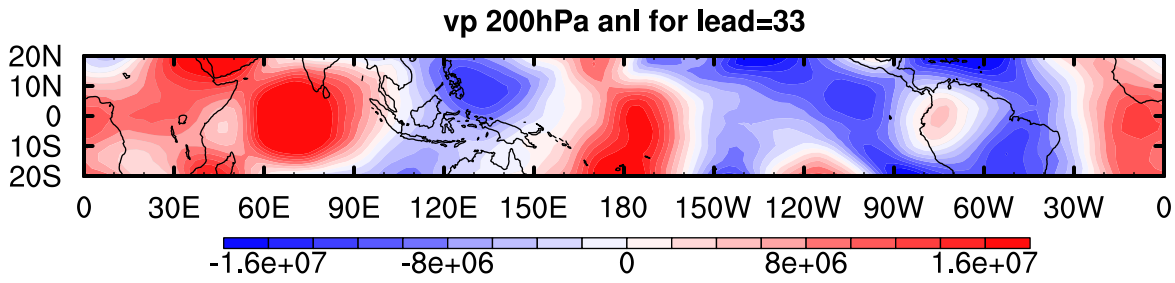

vp 850hPa anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

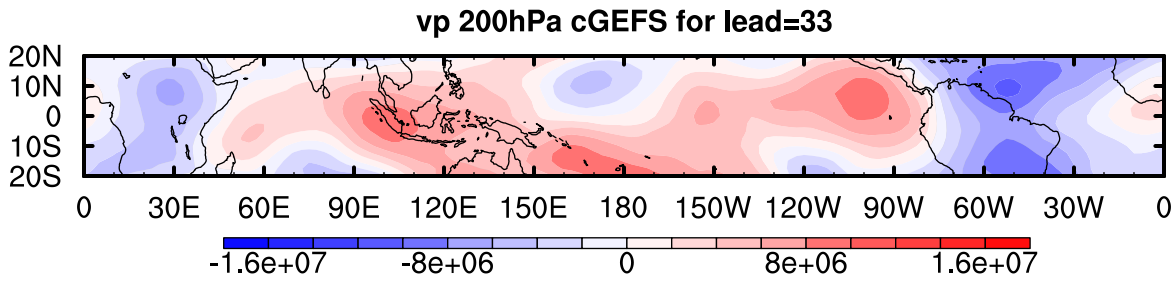

vp 850hPa cGEFS for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

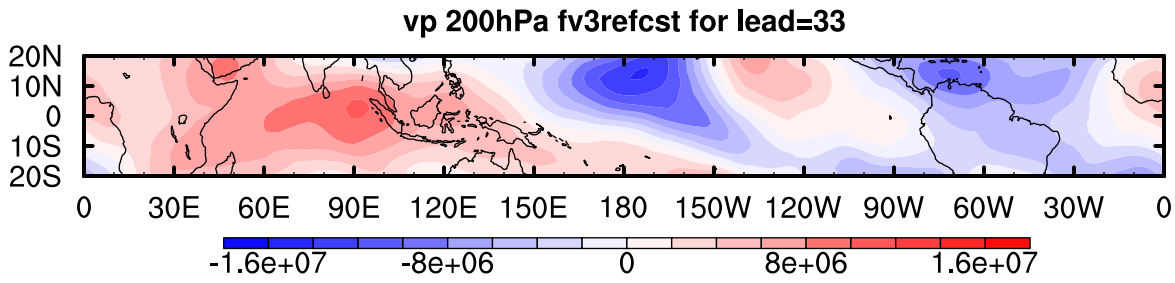

vp 850hPa fv3refcst for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

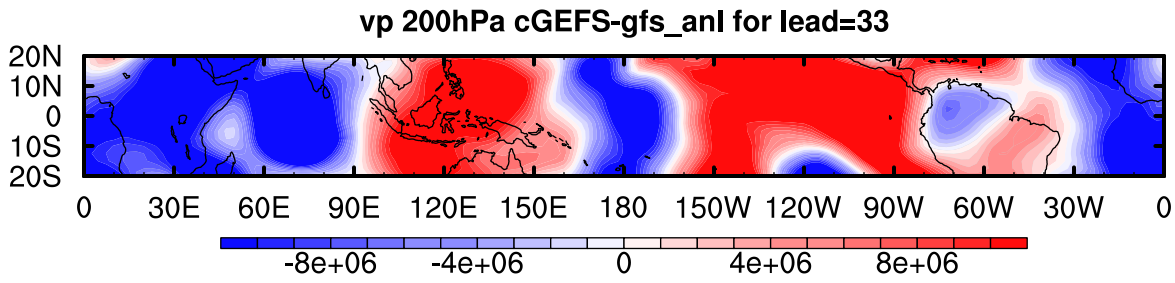

vp 850hPa cGEFS-gfs_anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

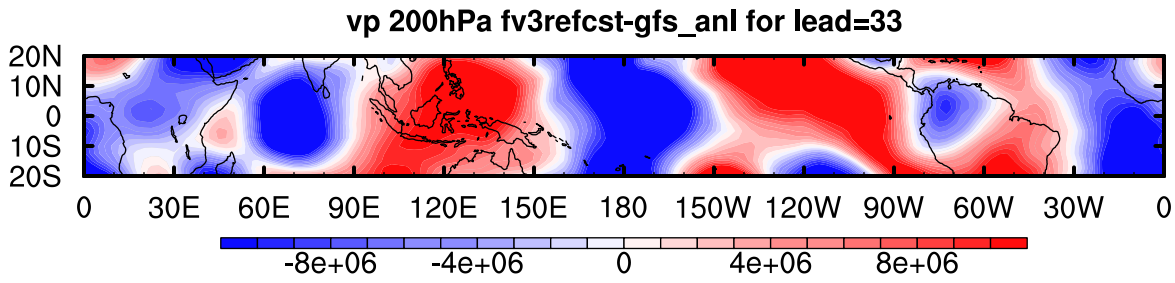

vp 850hPa fv3refcst-gfs_anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

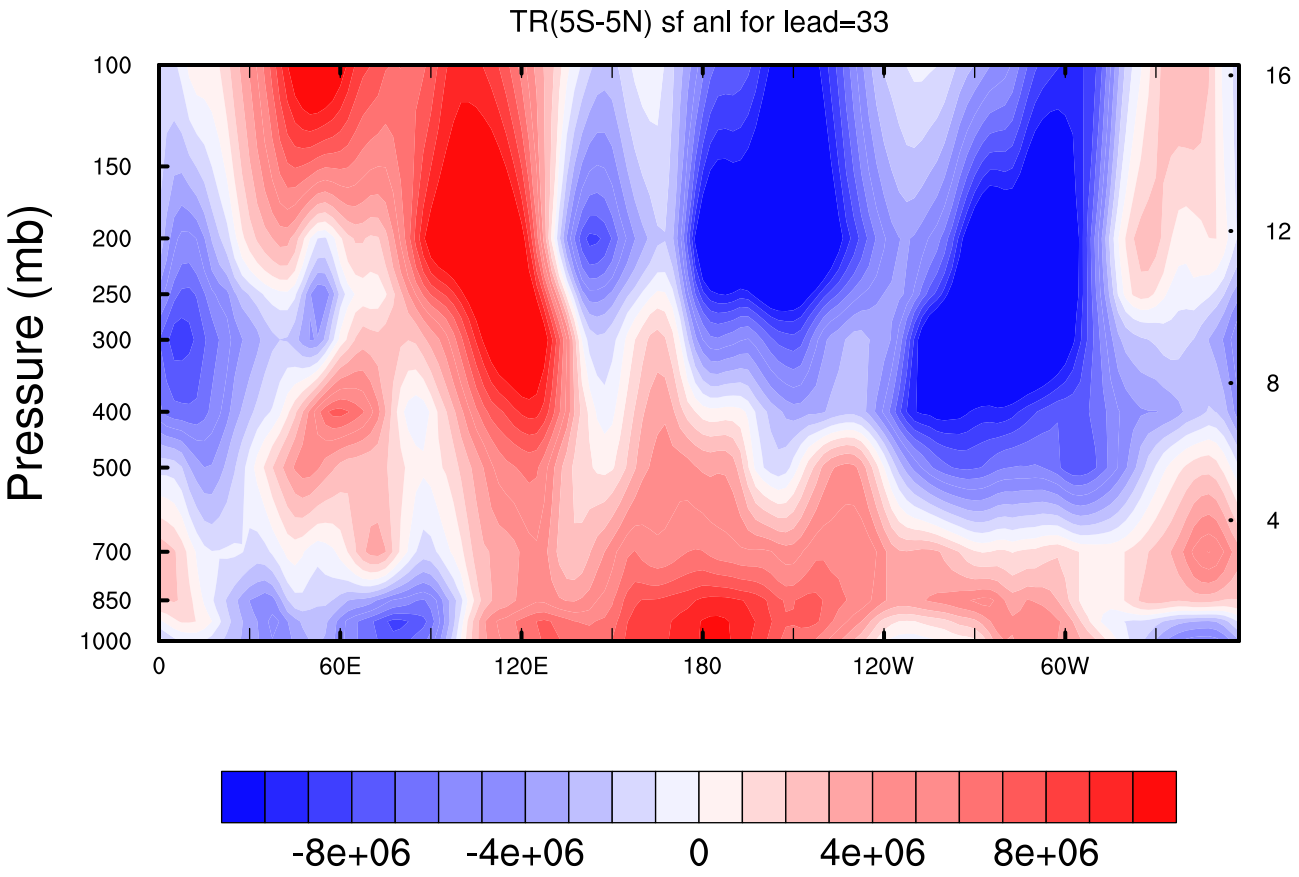

vp 200hPa anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

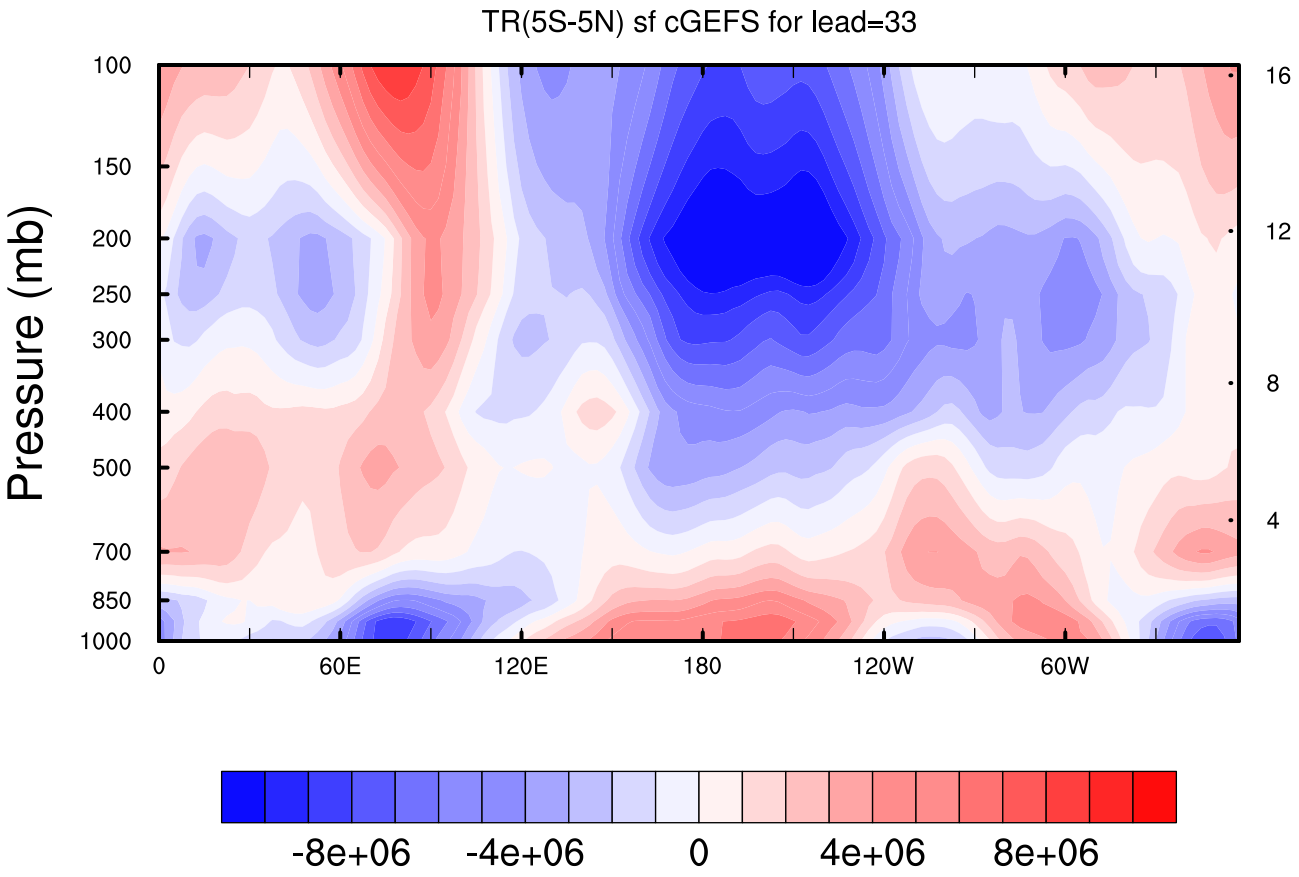

vp 200hPa cGEFS for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

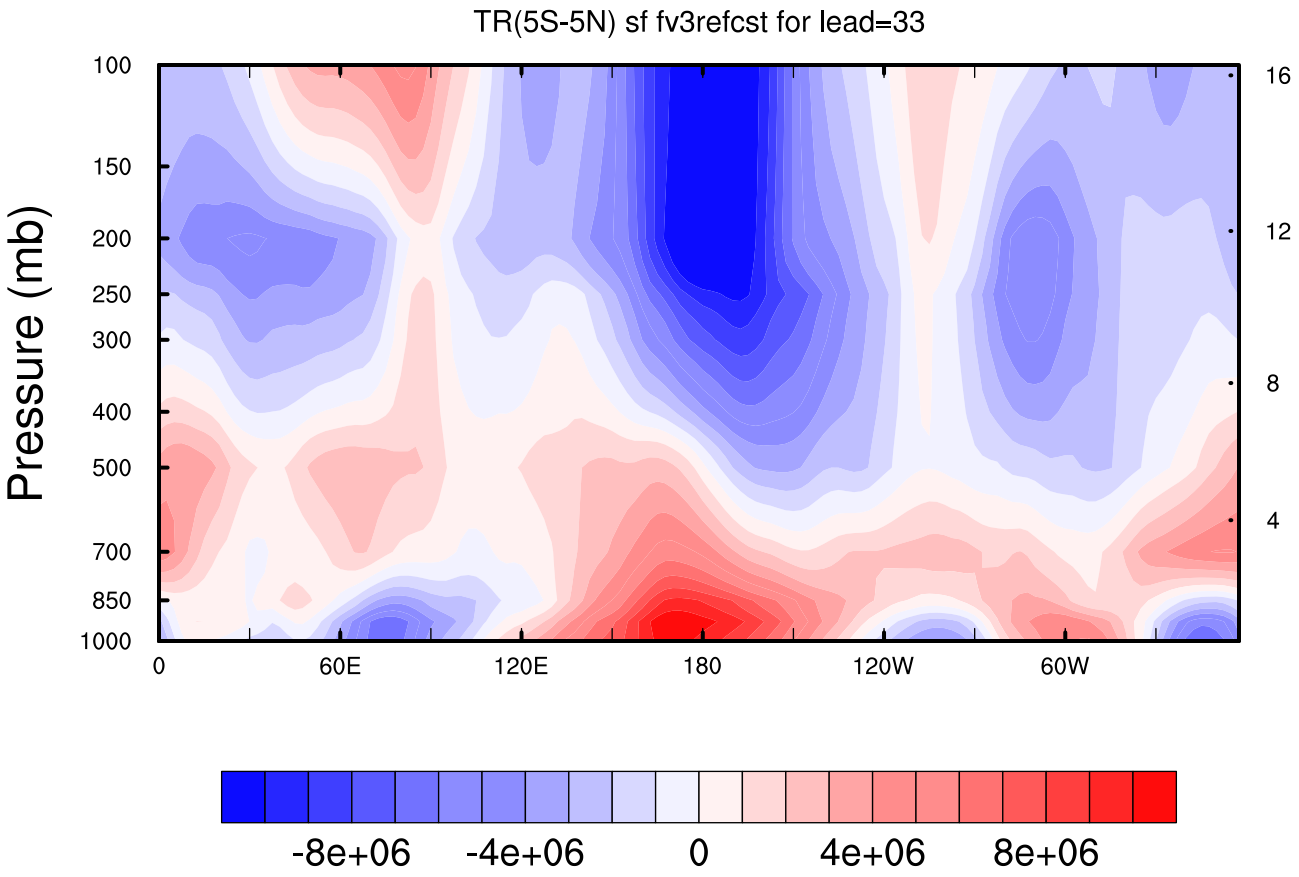

vp 200hPa fv3refcst for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

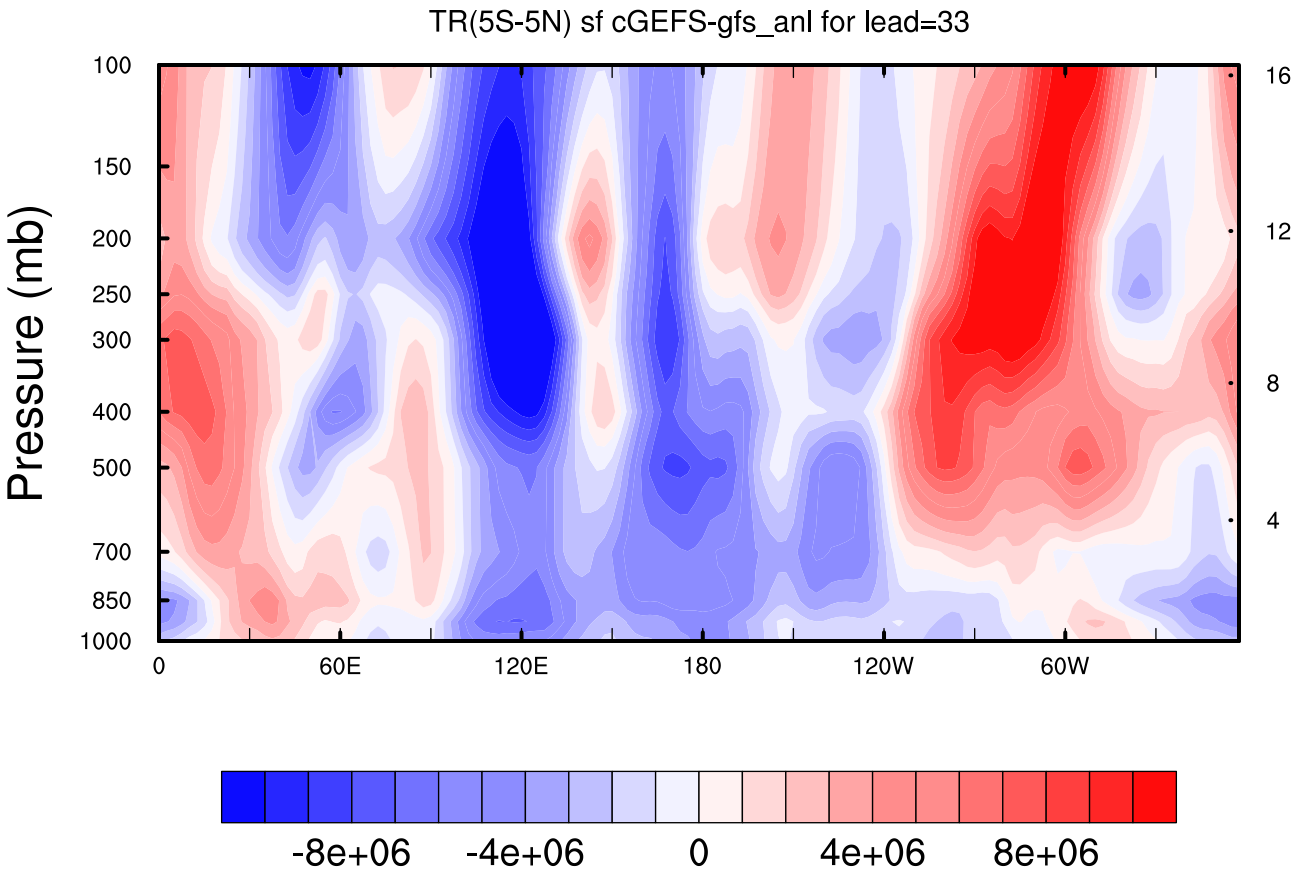

vp 200hPa cGEFS-gfs_anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

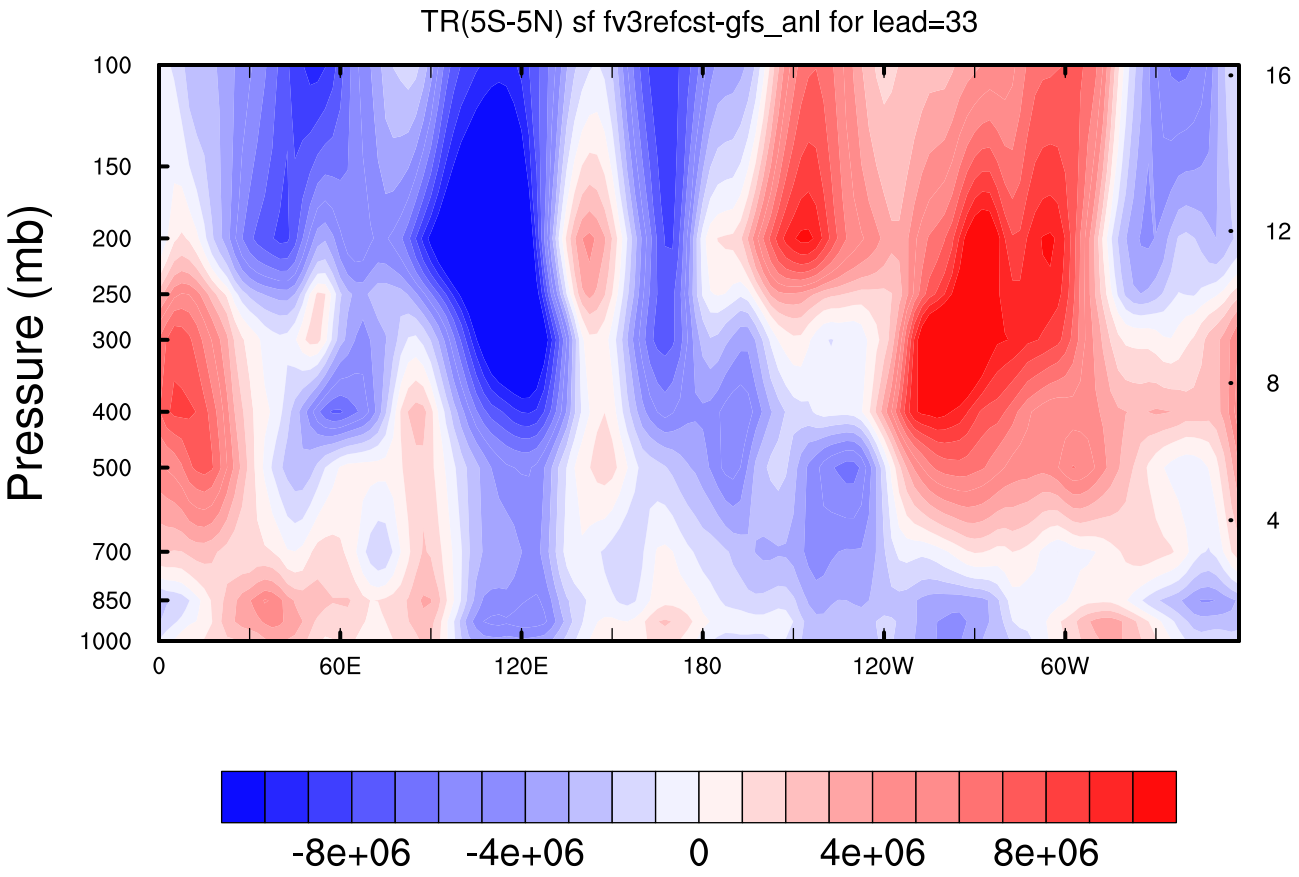

vp 200hPa fv3refcst-gfs_anl for lead=33
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

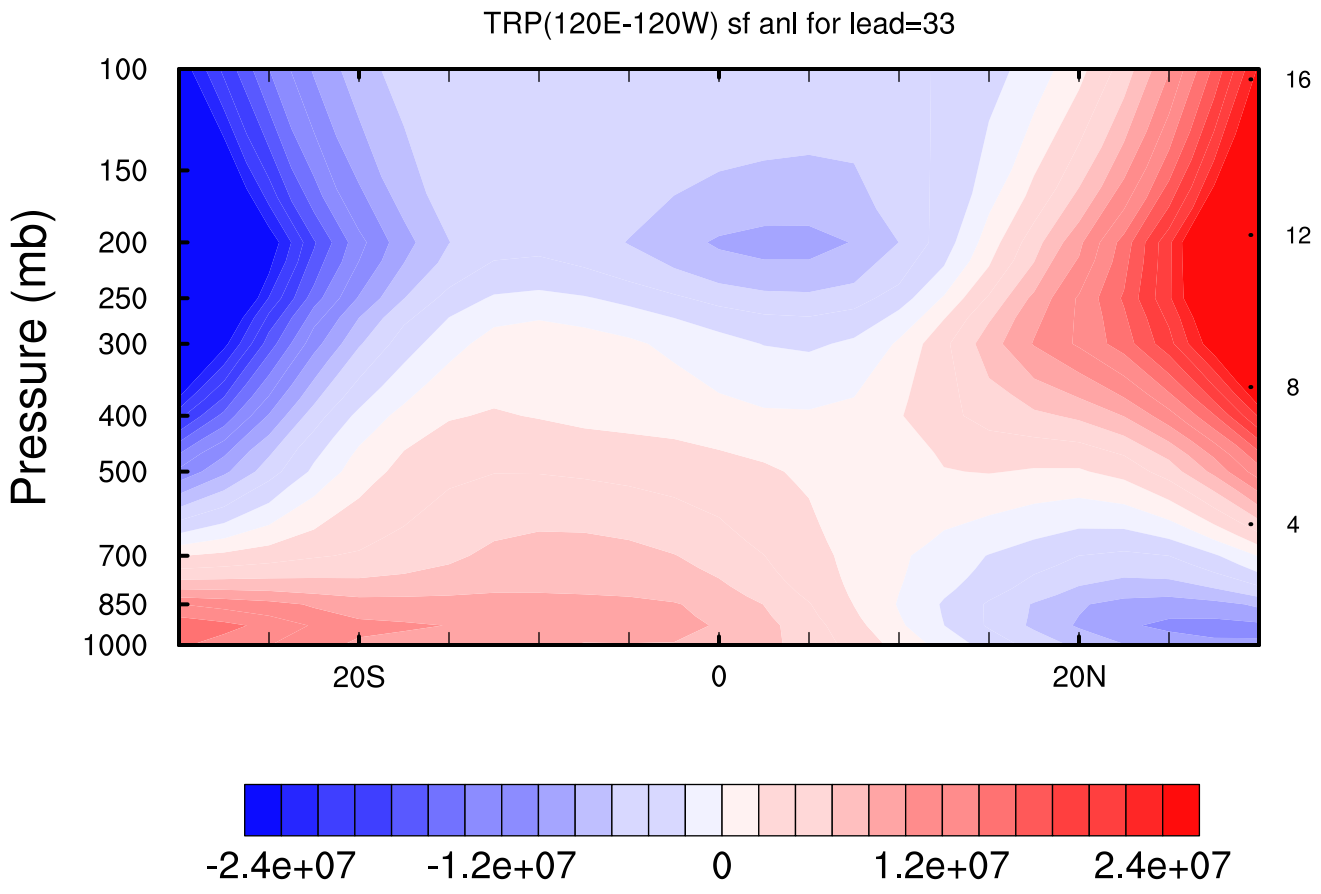

TR(5S-5N) sf anl for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

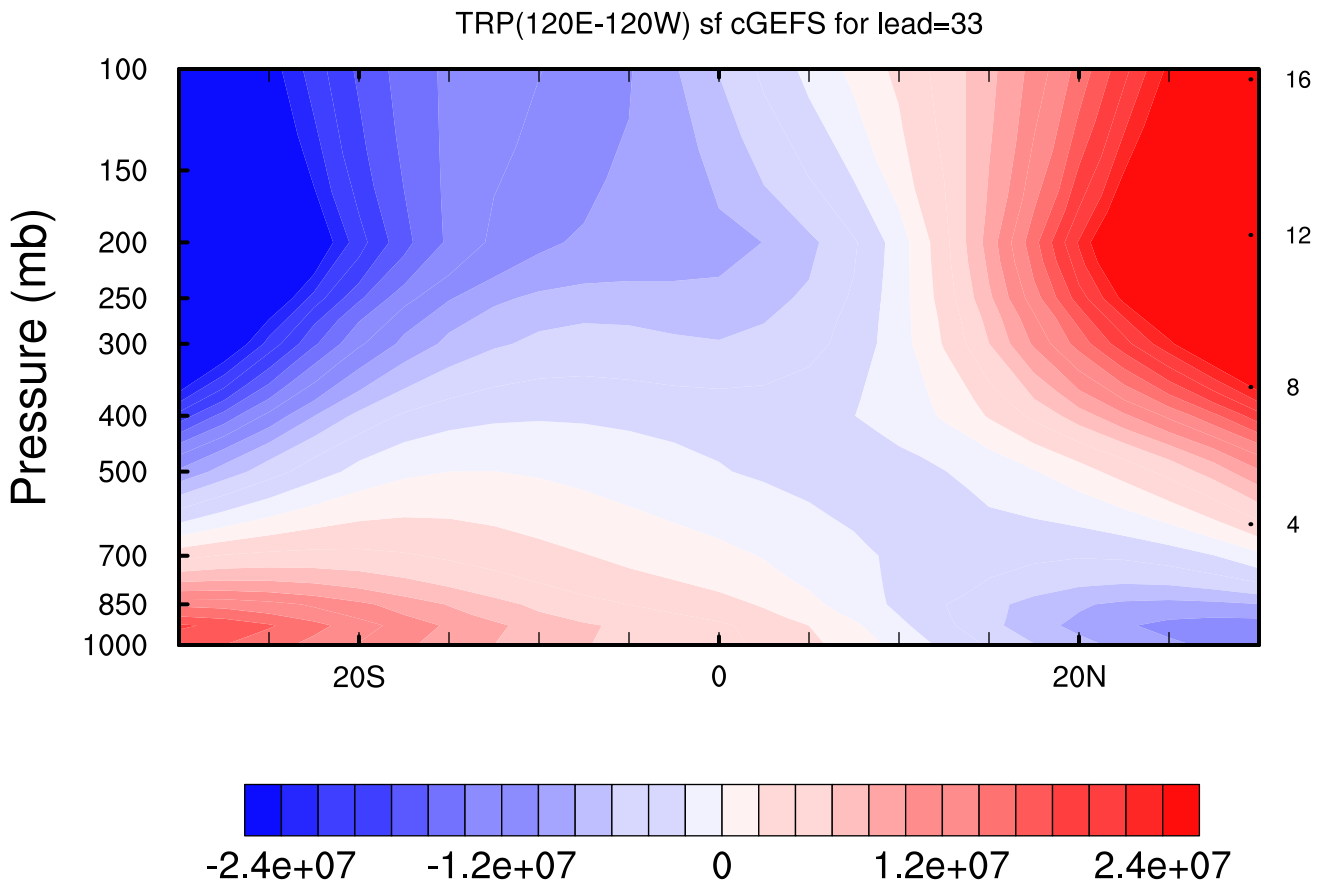

TR(5S-5N) sf cGEFS for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

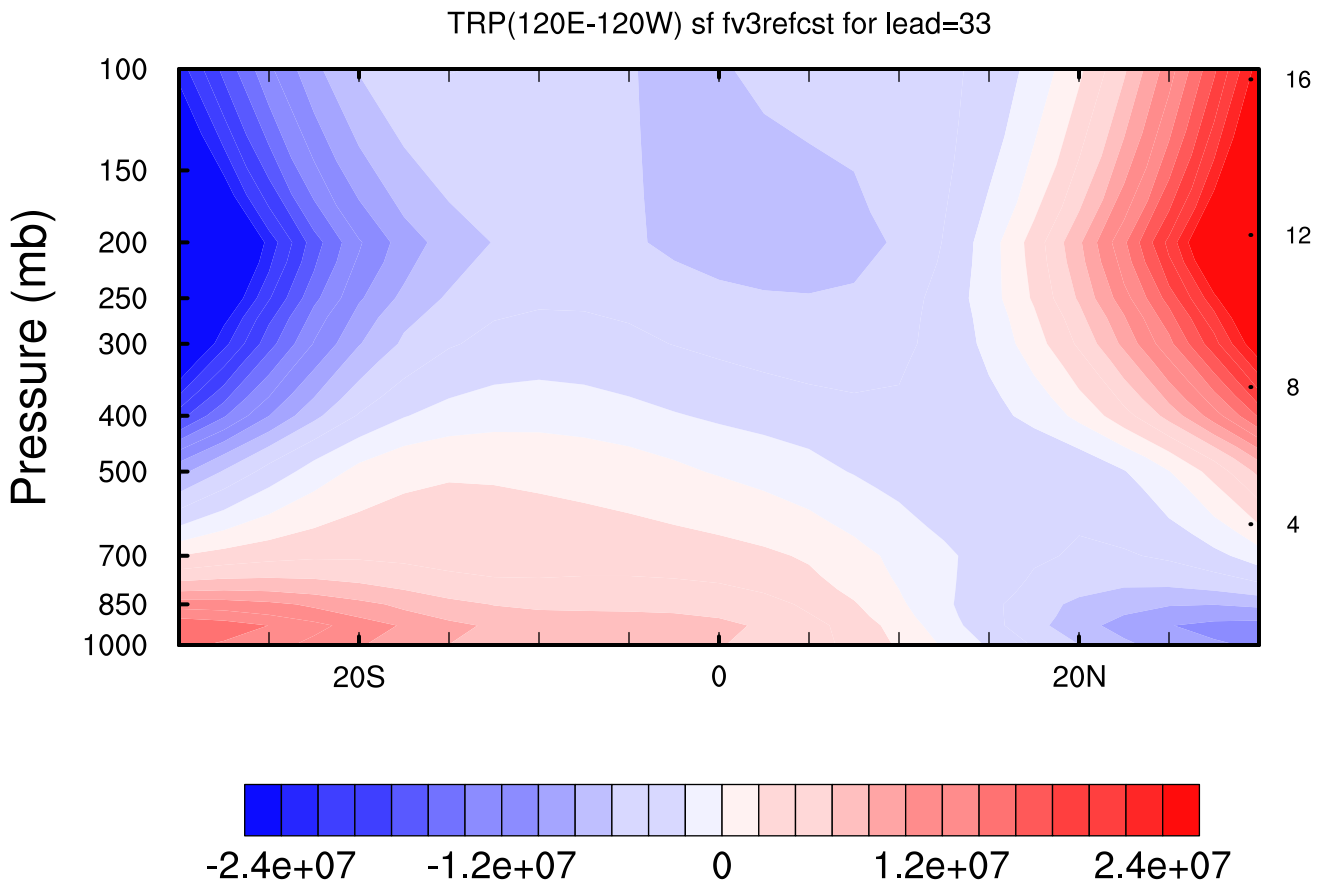

TR(5S-5N) sf fv3refcst for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

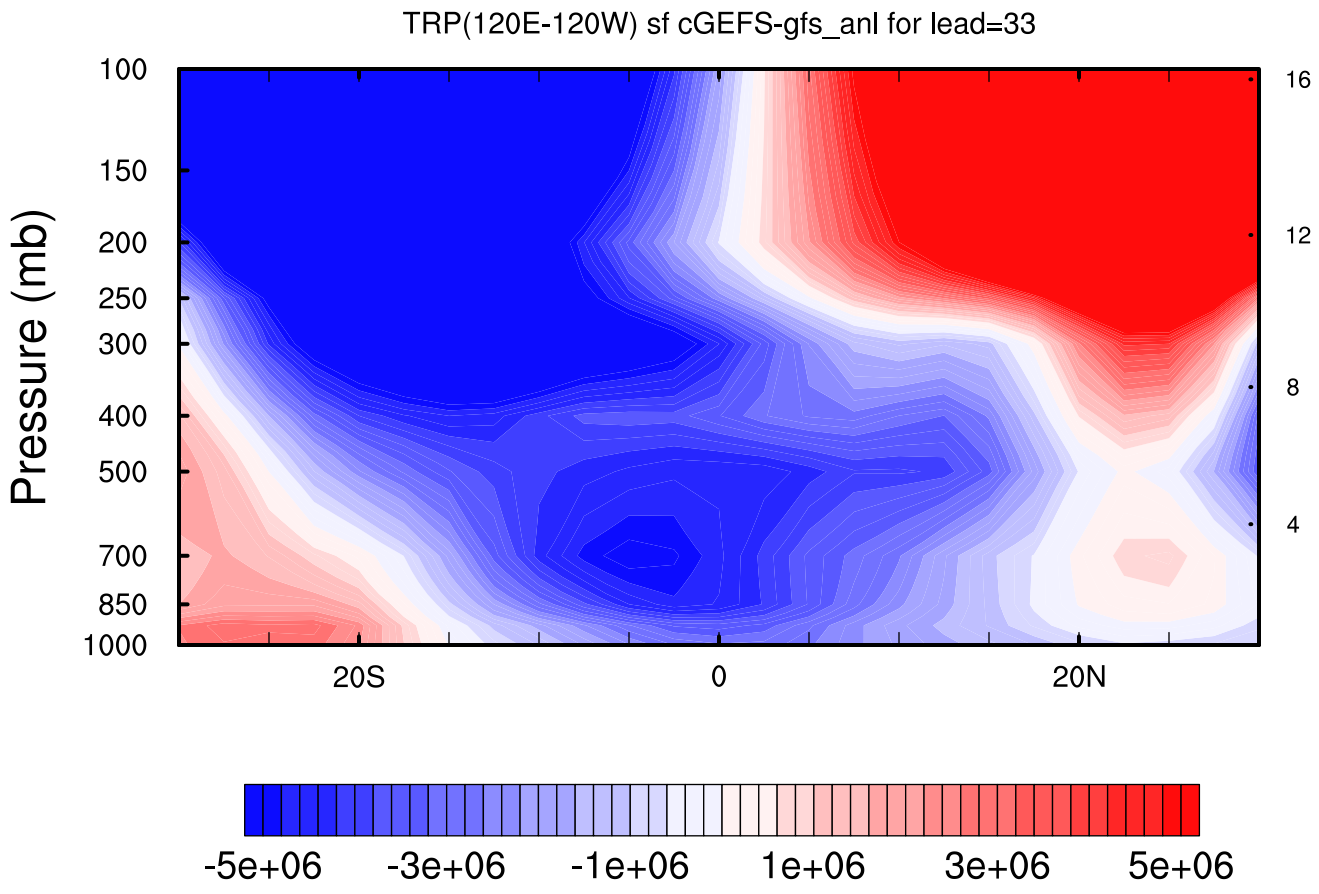

TR(5S-5N) sf cGEFS-gfs_anl for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

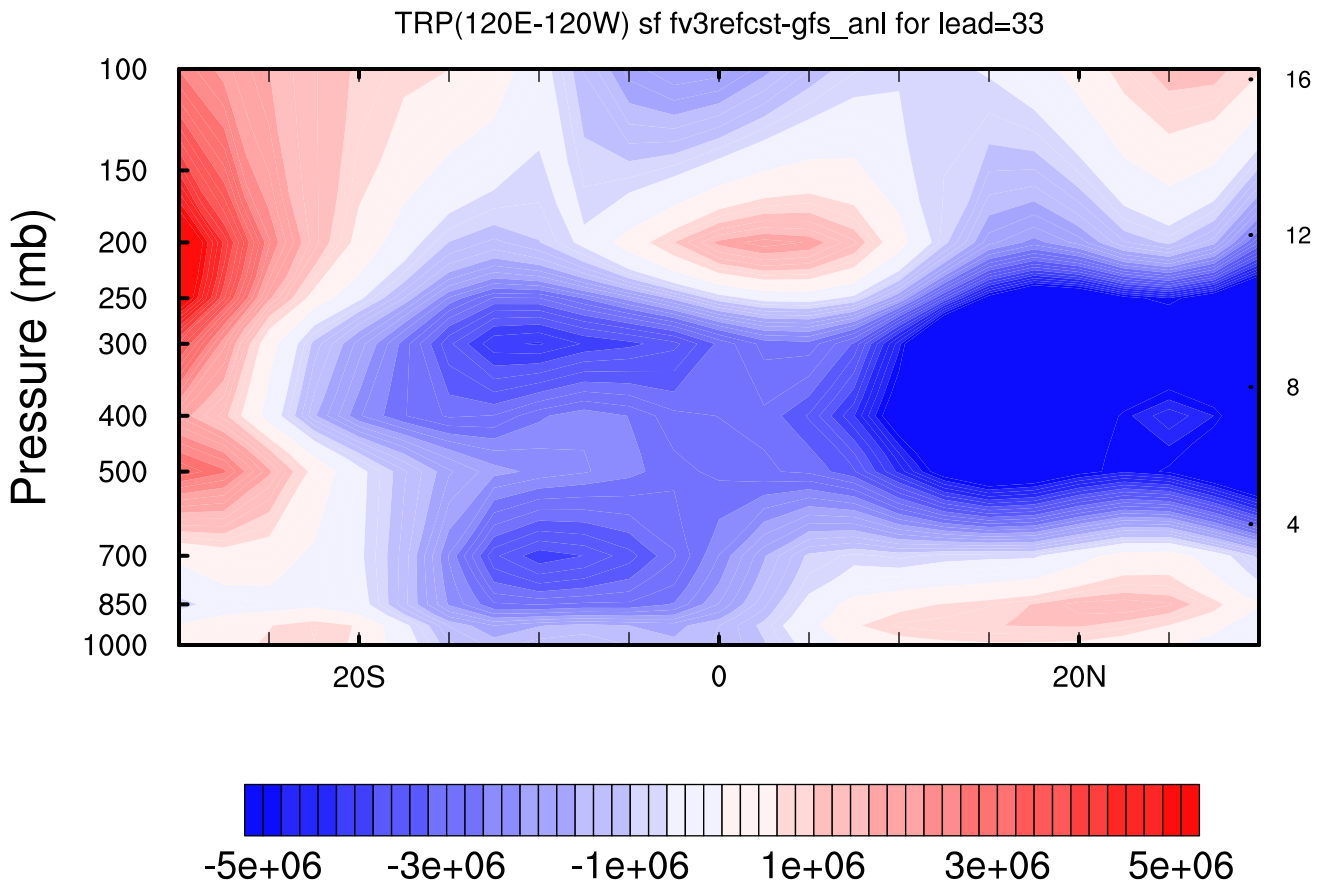

TR(5S-5N) sf fv3refcst-gfs_anl for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

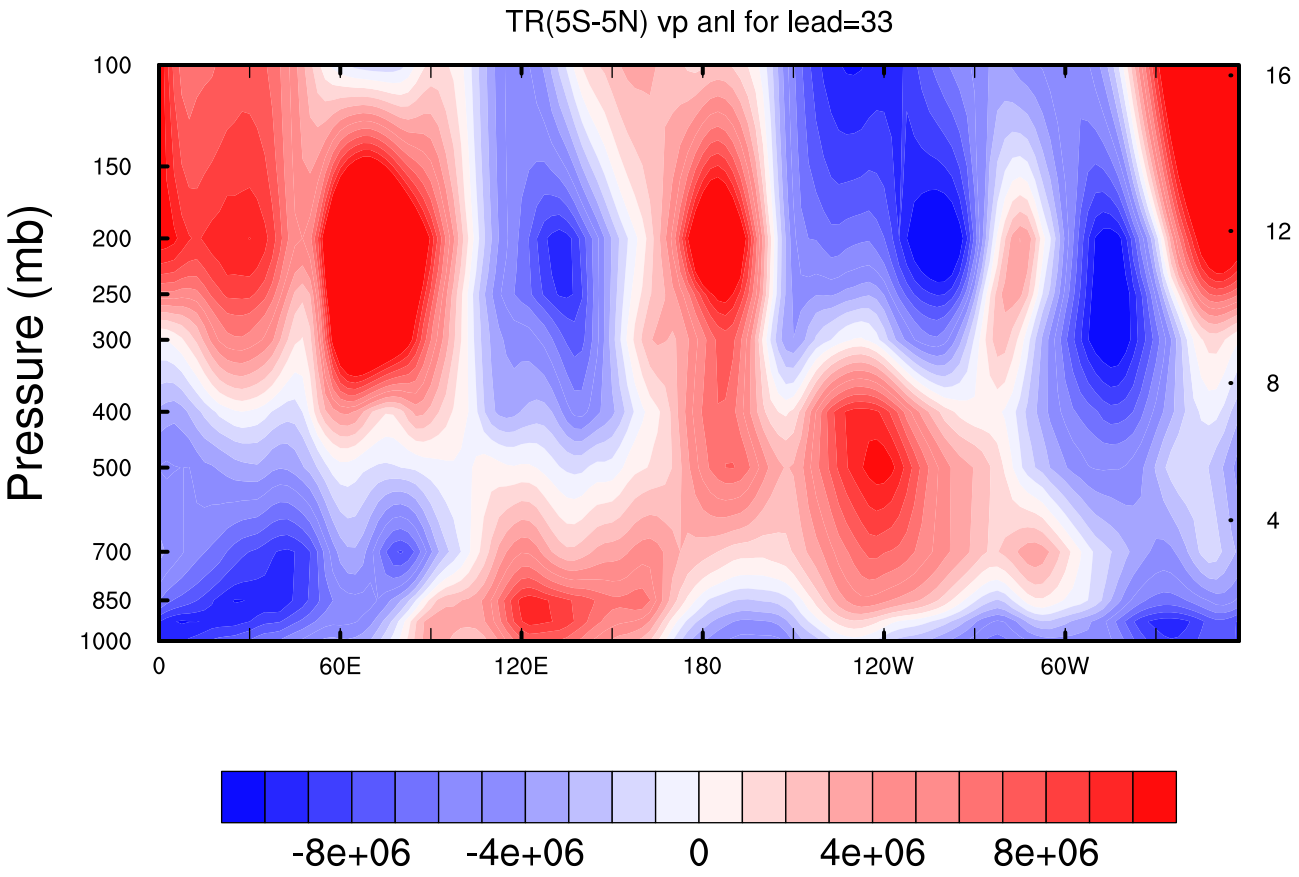

TRP(120E-120W) sf anl for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

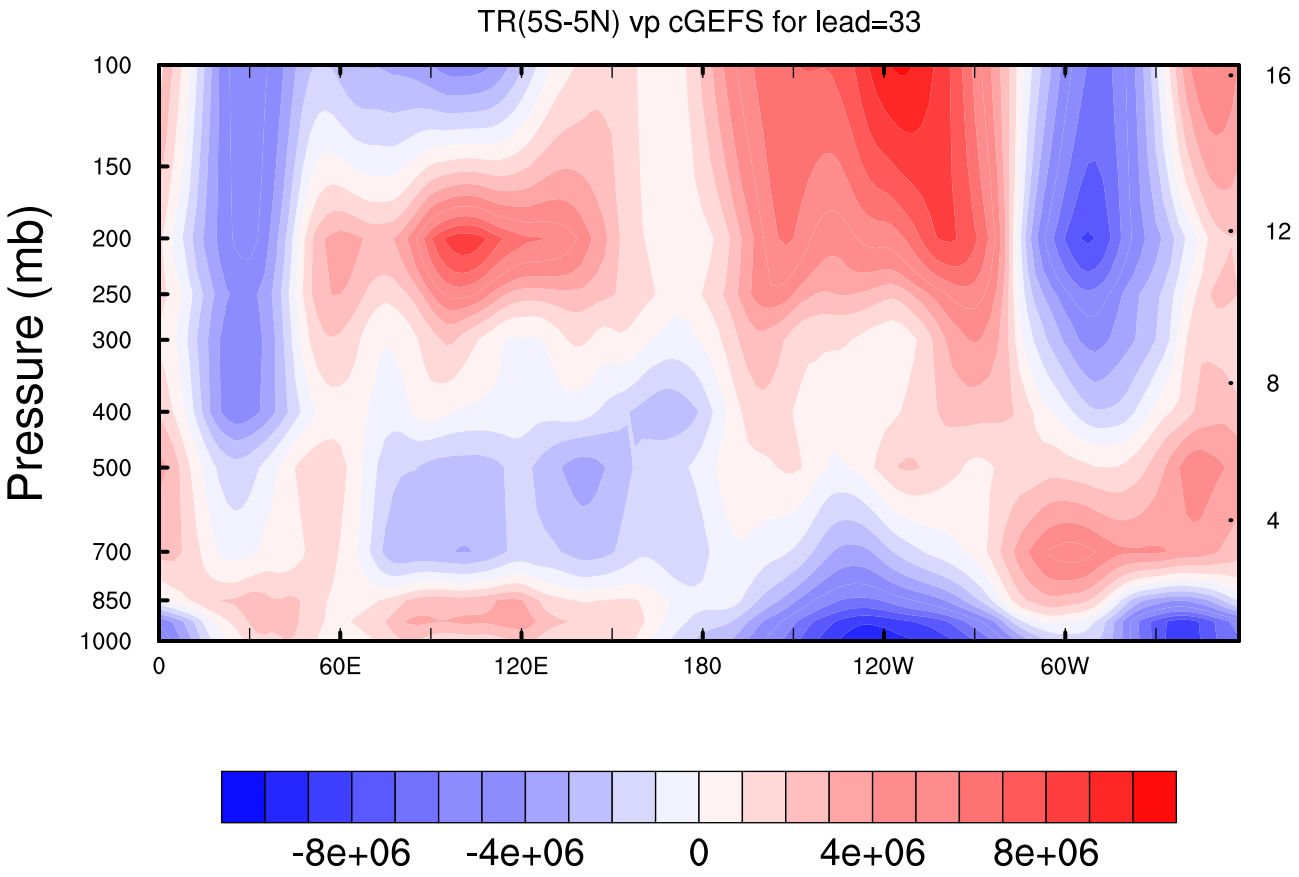

TRP(120E-120W) sf cGEFS for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

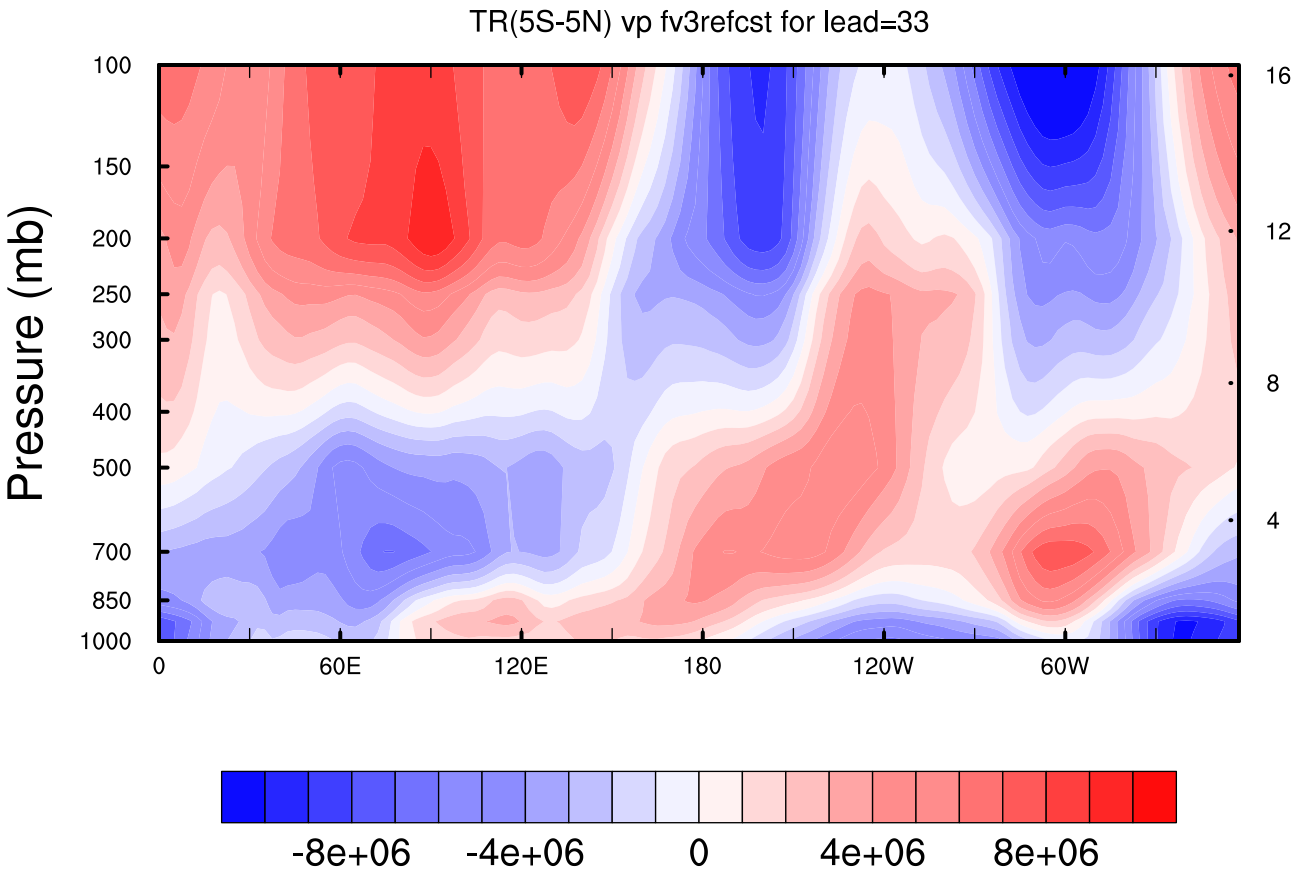

TRP(120E-120W) sf fv3refcst for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

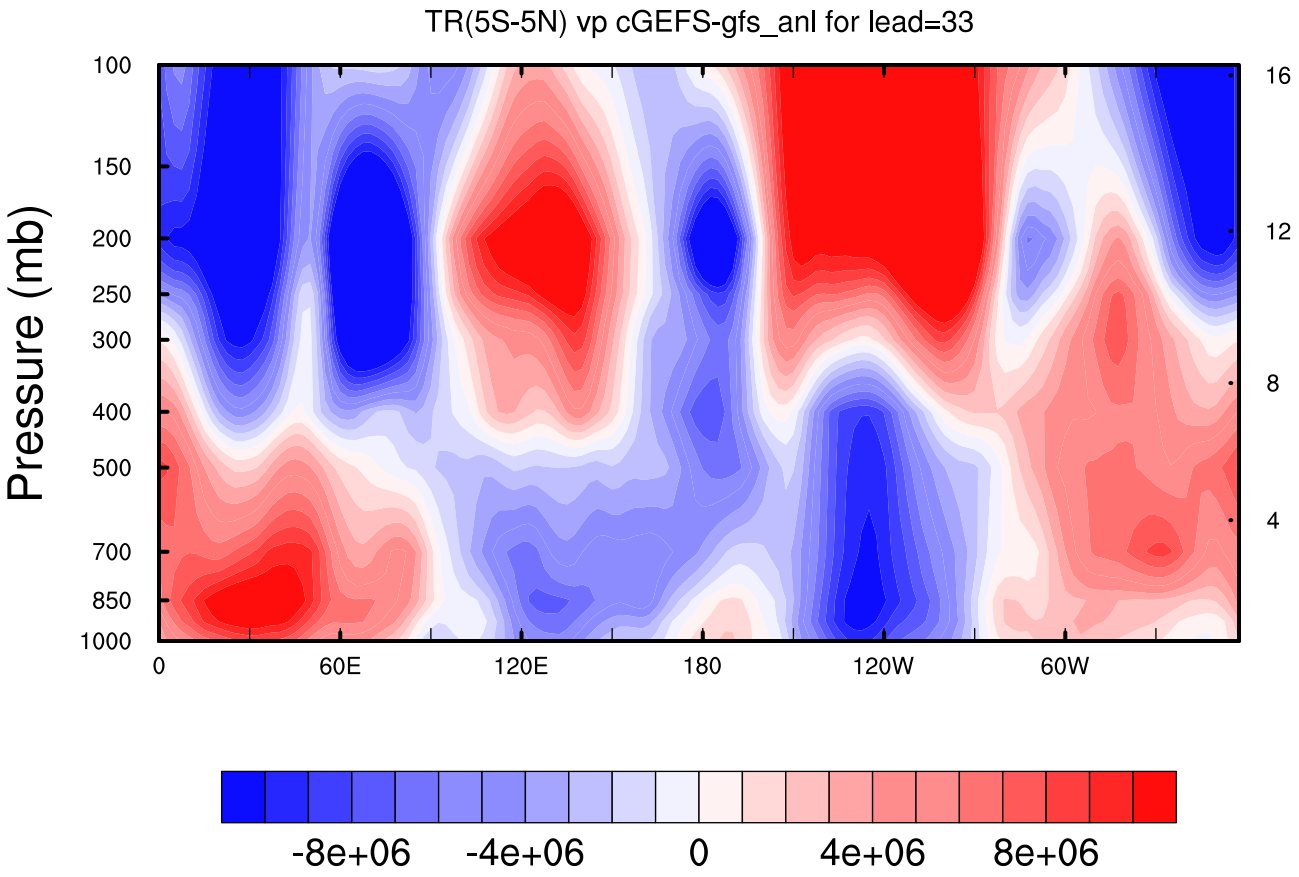

TRP(120E-120W) sf cGEFS-gfs_anl for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

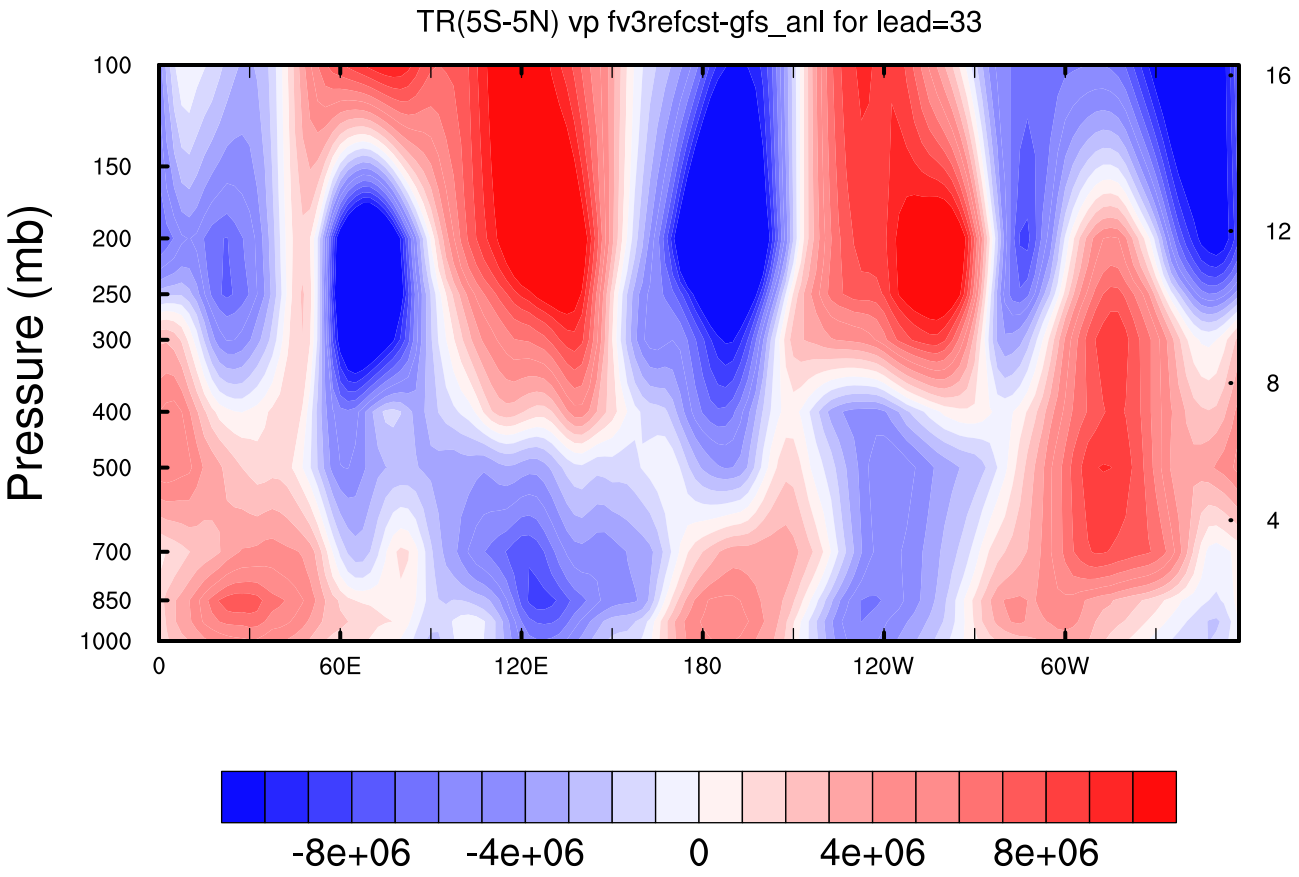

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

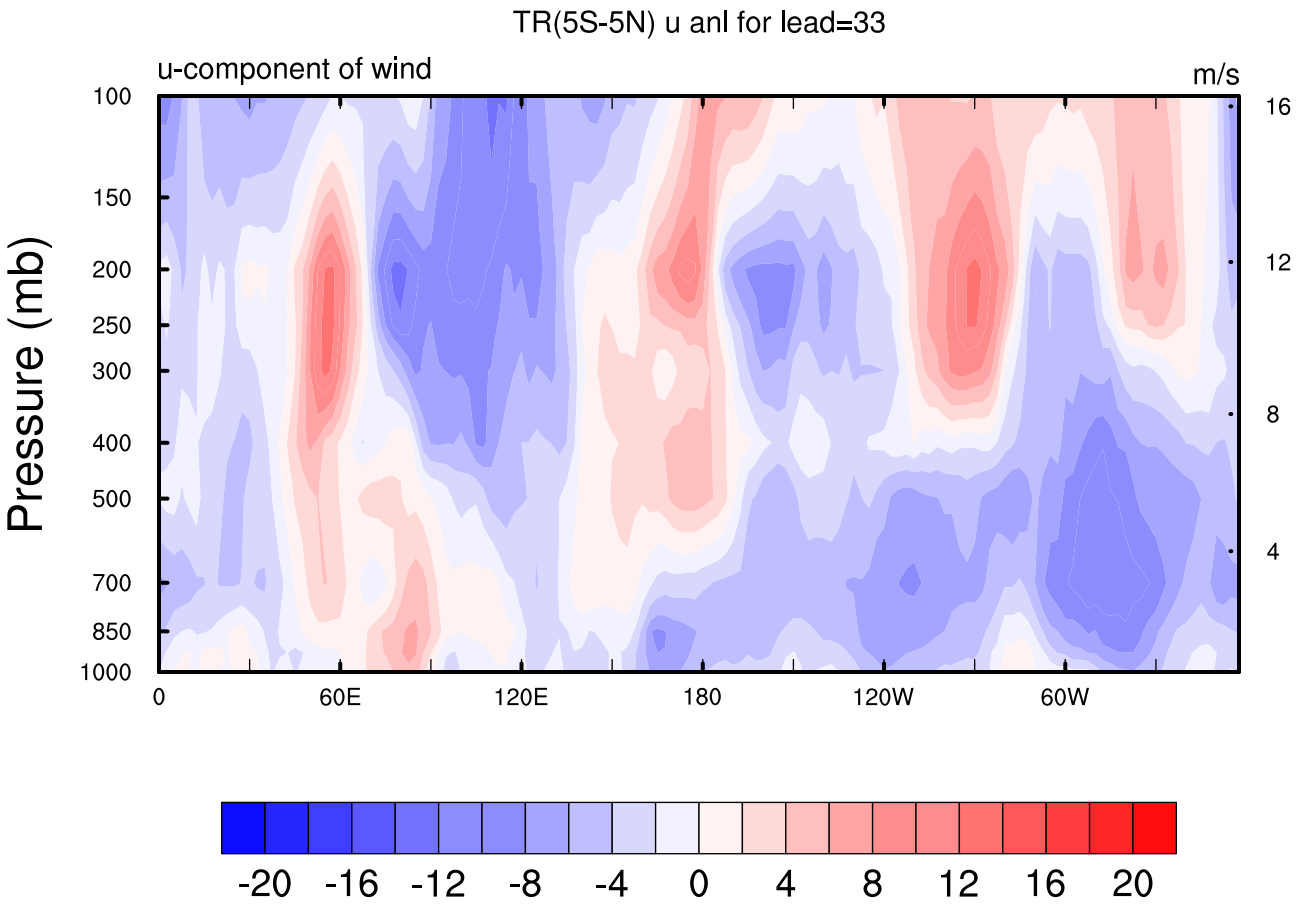

TR(5S-5N) vp anl for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

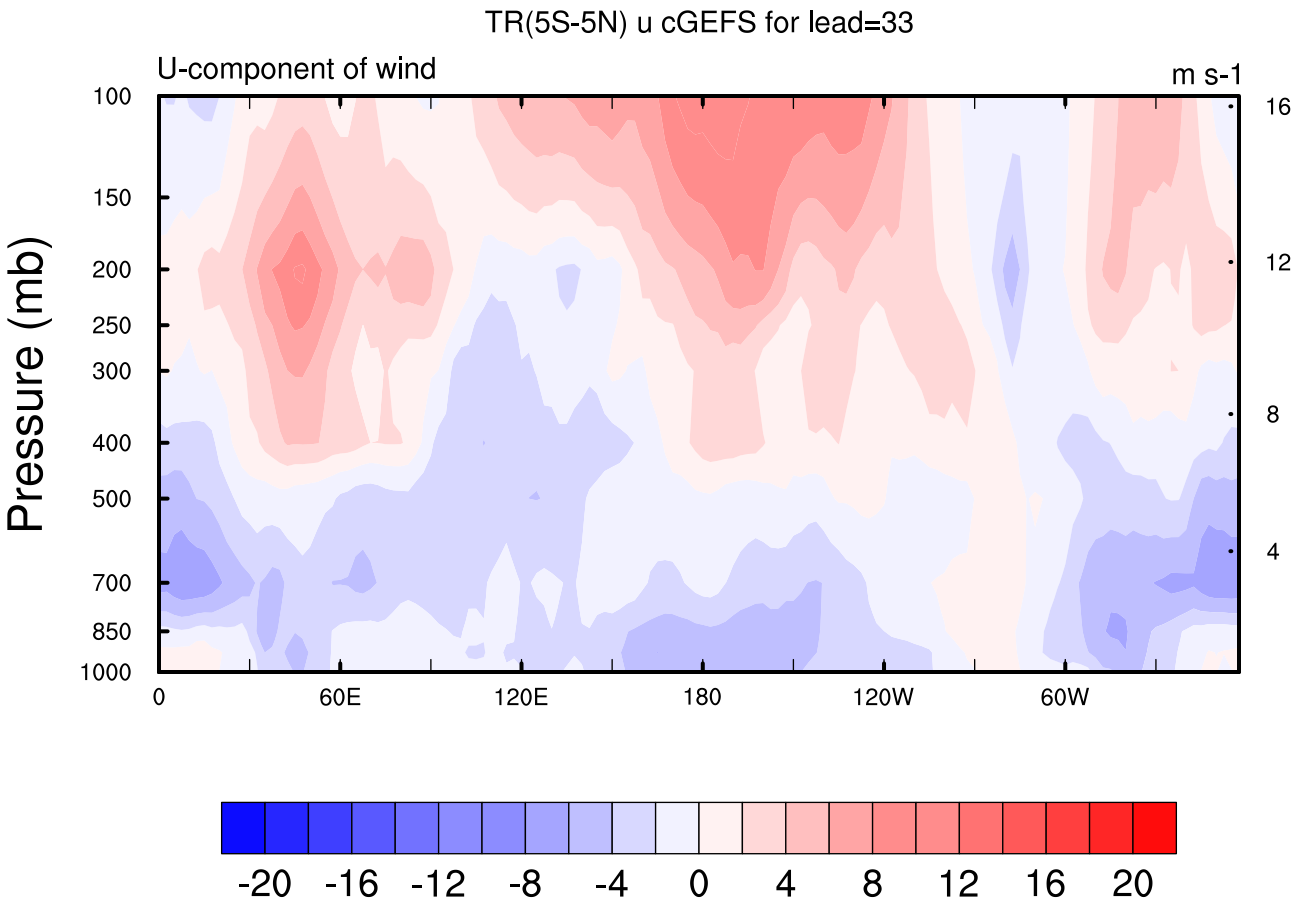

TR(5S-5N) vp cGEFS for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

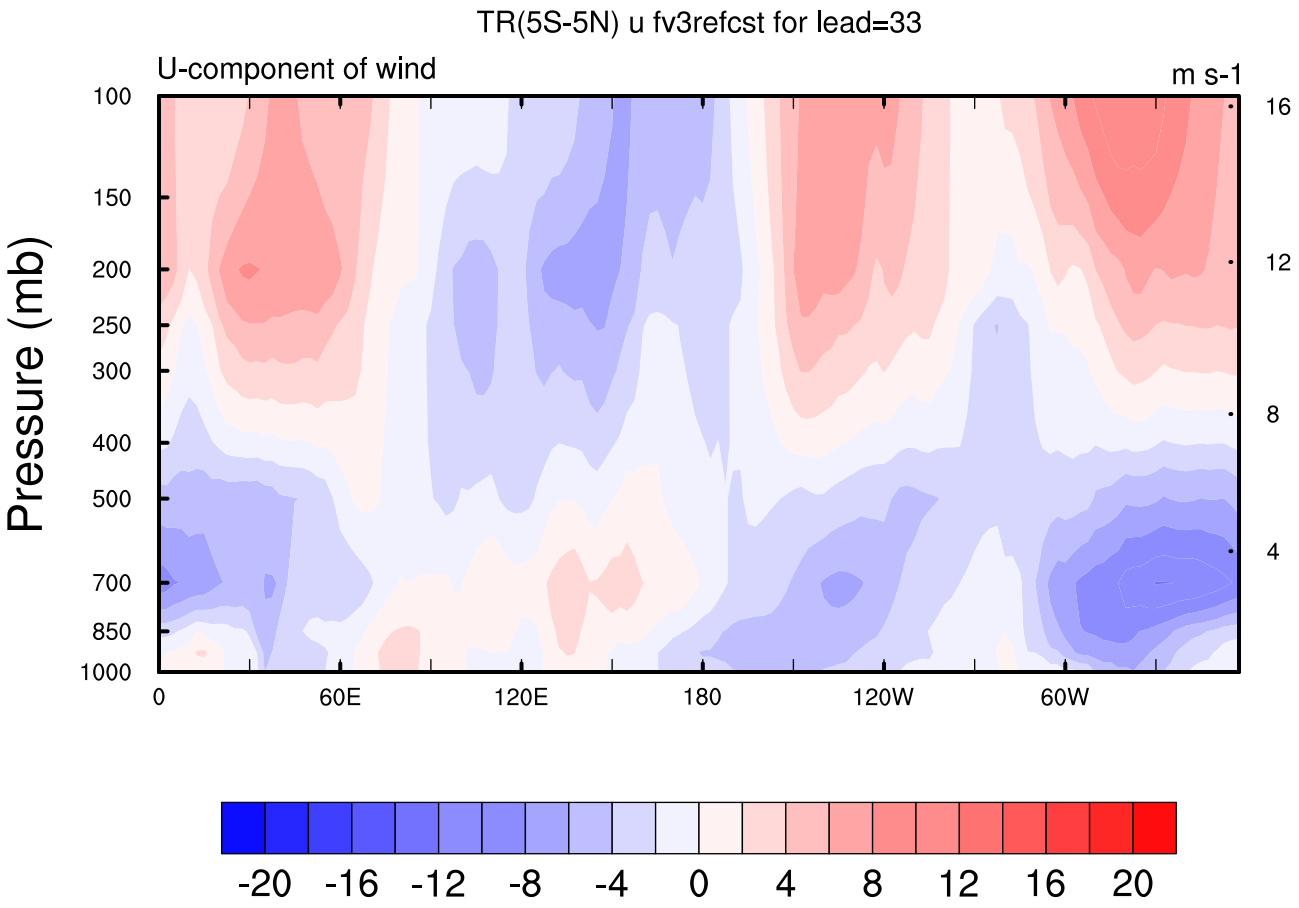

TR(5S-5N) vp fv3refcst for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

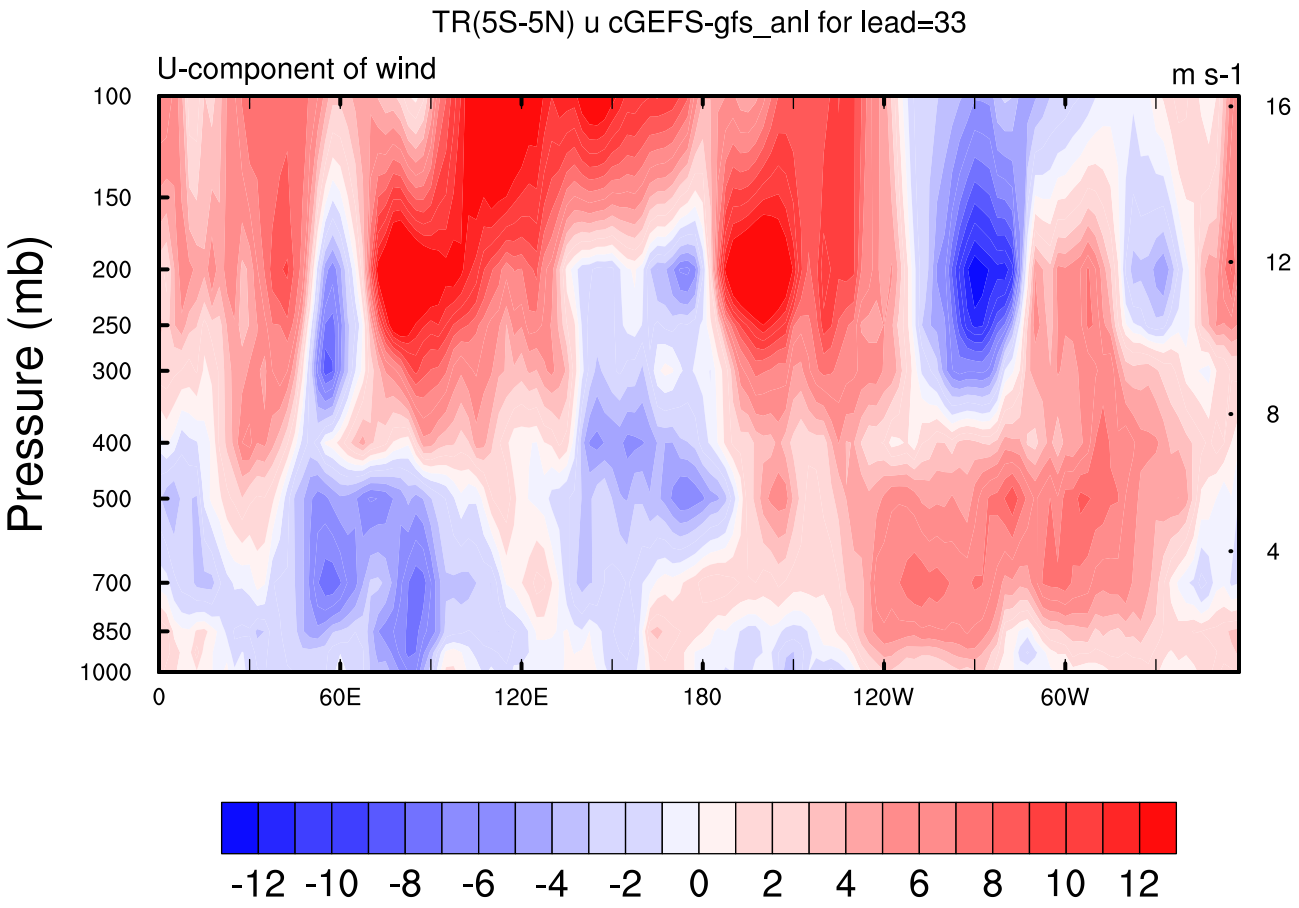

TR(5S-5N) vp cGEFS-gfs_anl for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) vp fv3refcst-gfs_anl for lead=33
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) u anl for lead=33
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS for lead=33
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u fv3refcst for lead=33
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=33
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
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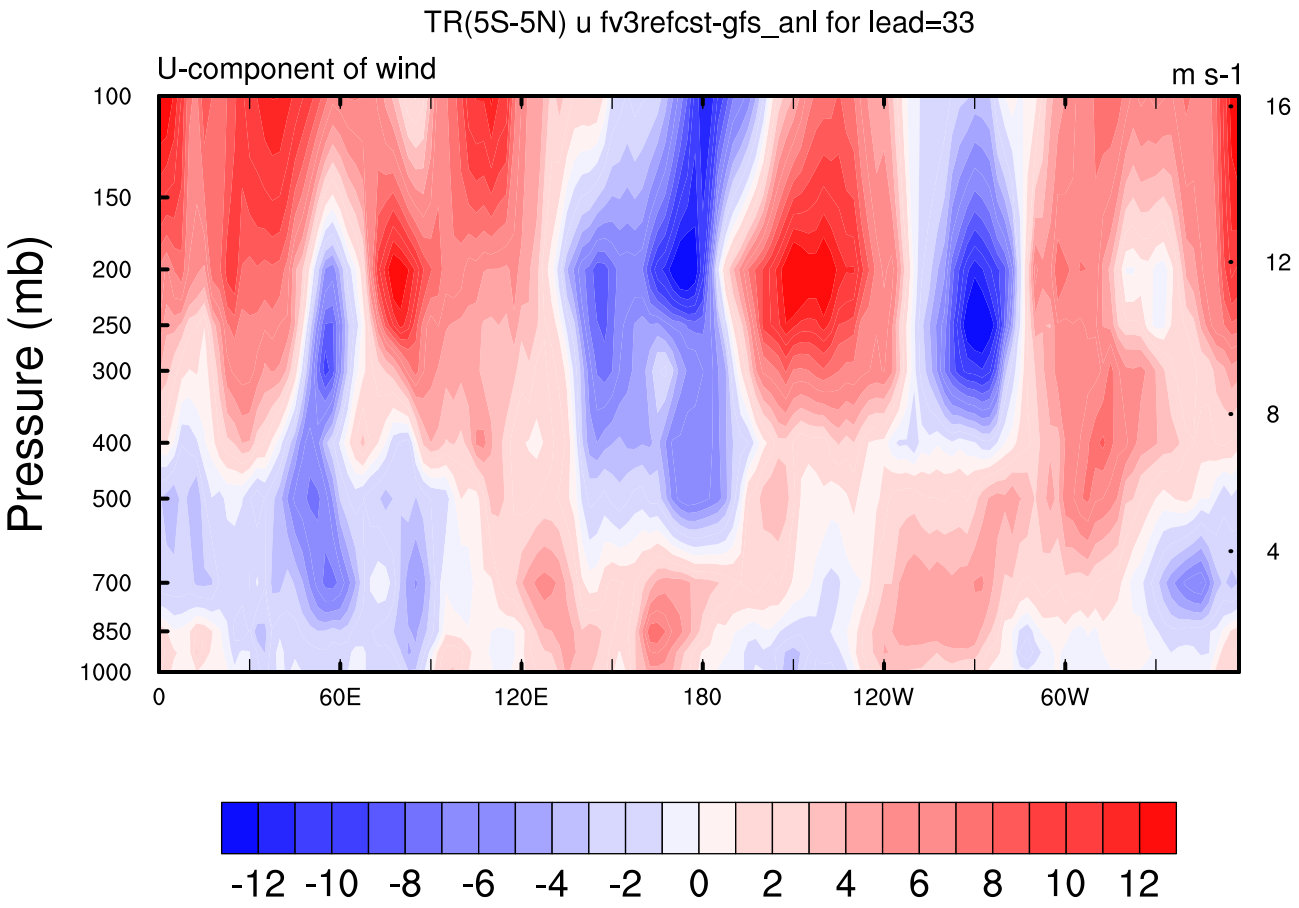
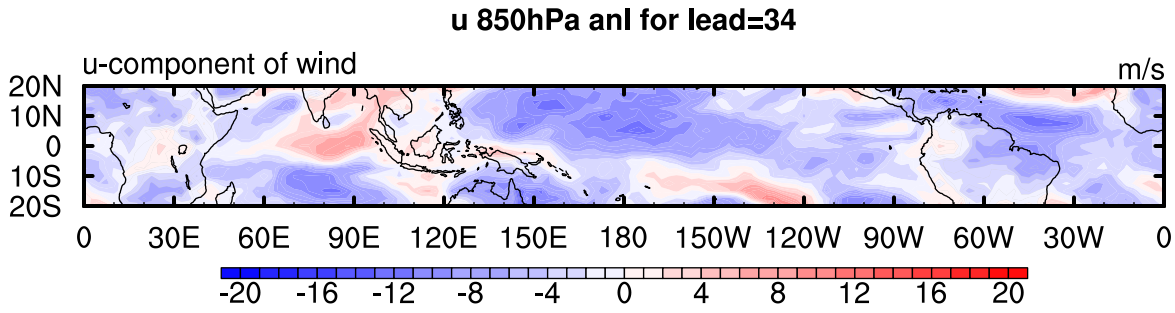
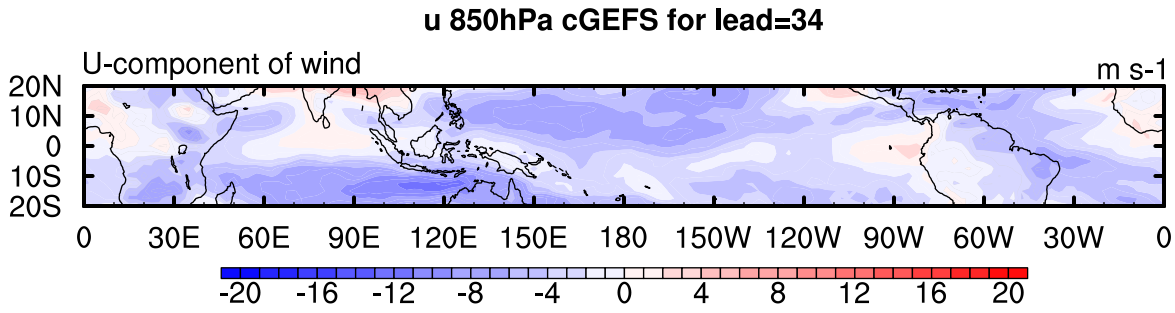
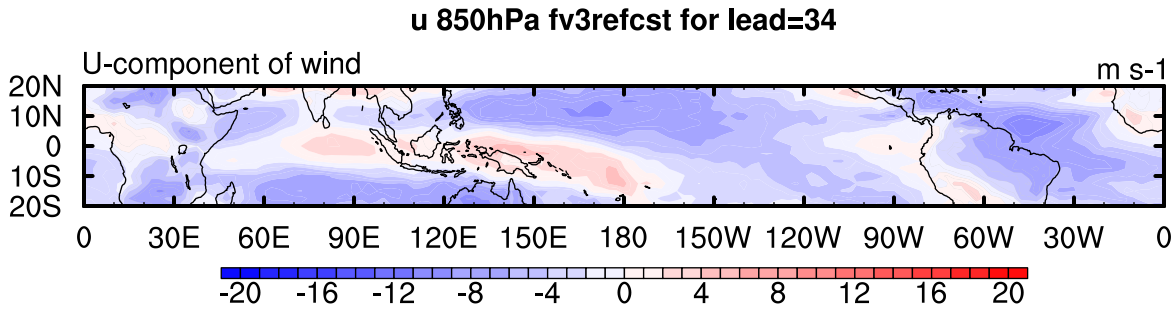
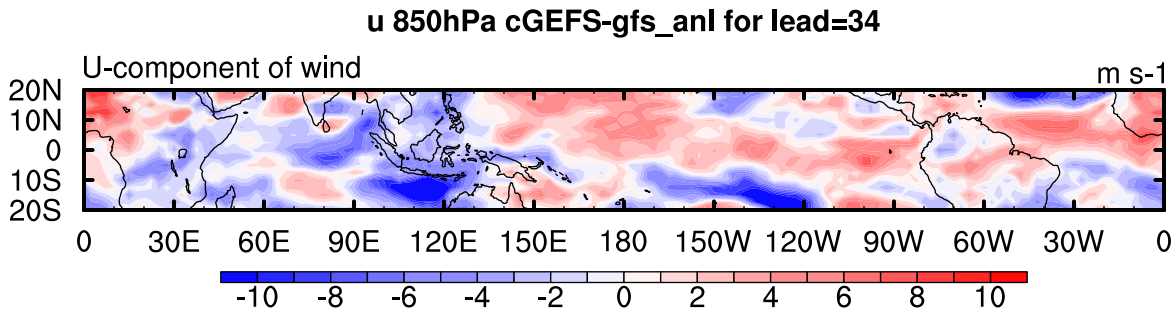
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=33
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


u 850hPa anl for lead=34
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS for lead=34
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa fv3refcst for lead=34
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 850hPa cGEFS-gfs_anl for lead=34
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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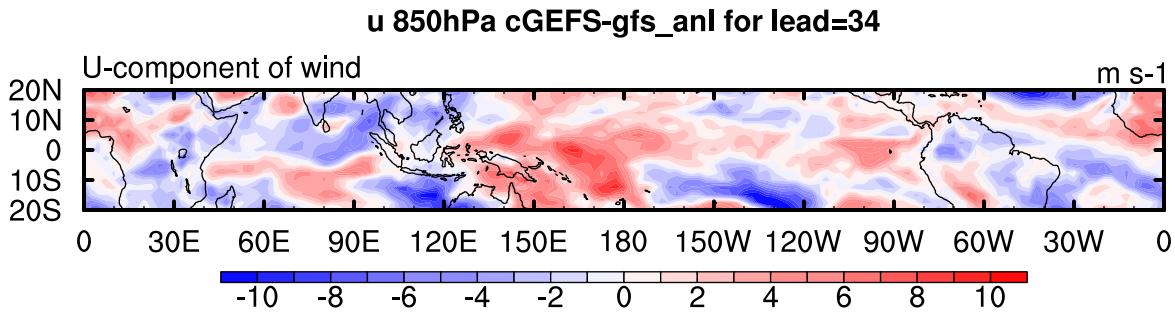
-10
-8
-6
-4
-2
0
2
4
6
8
10


u 850hPa cGEFS-gfs_anl for lead=34
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
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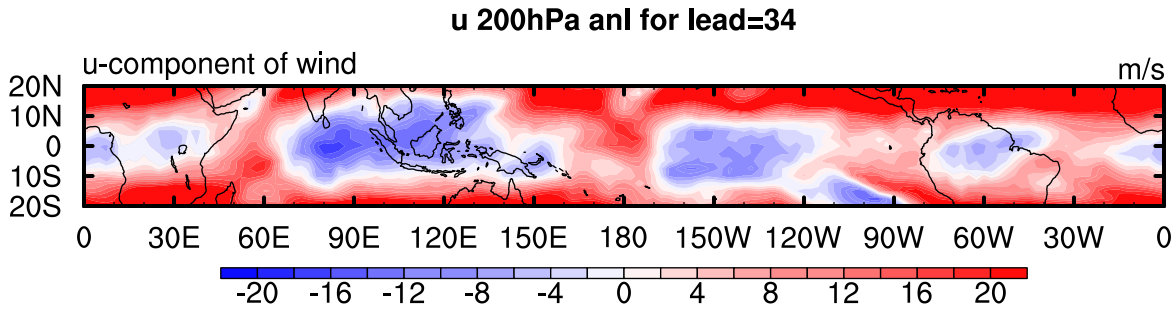
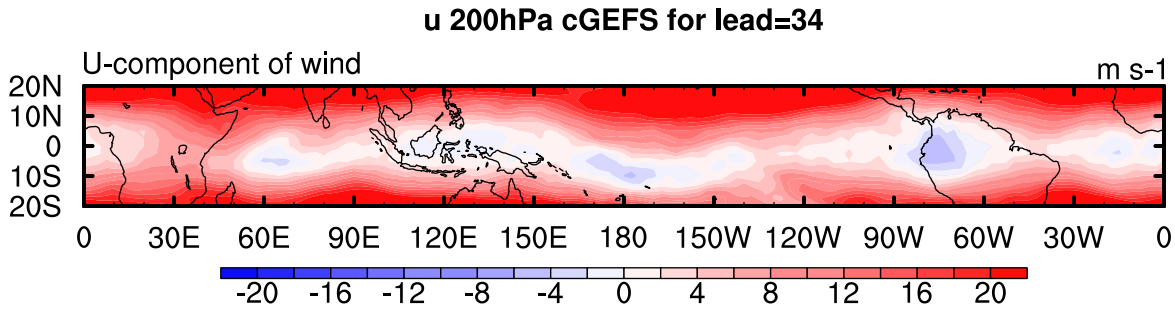
-4
-2
0
2
4
6
8
10


u 200hPa anl for lead=34
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20


u 200hPa cGEFS for lead=34
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
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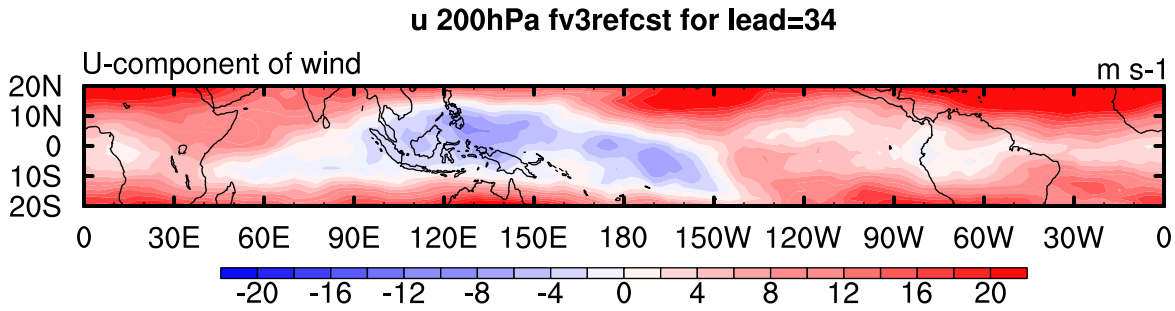
8
12
16
20


u 200hPa fv3refcst for lead=34
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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-4
0
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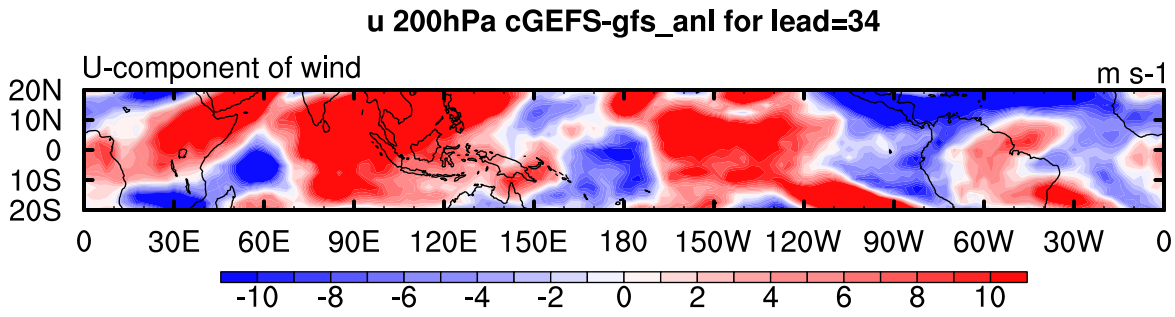
16
20


u 200hPa cGEFS-gfs_anl for lead=34
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
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-2
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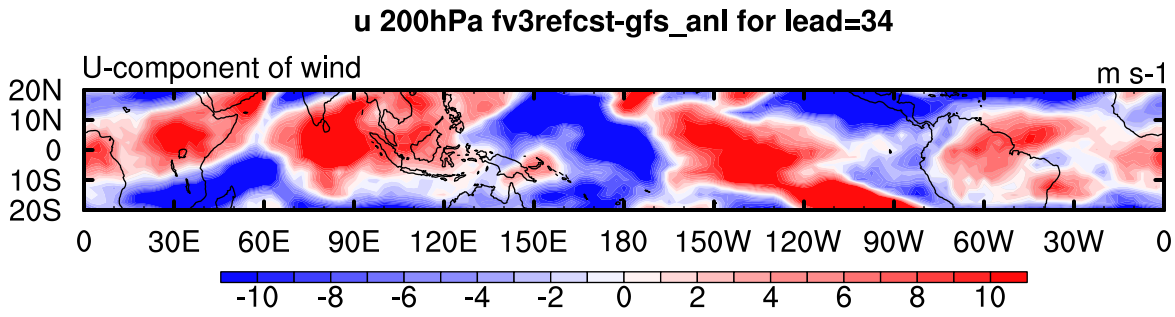
2
4
6
8
10


u 200hPa fv3refcst-gfs_anl for lead=34
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
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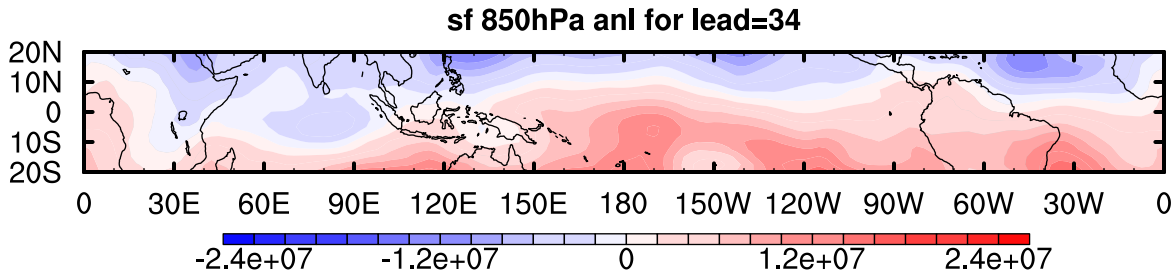
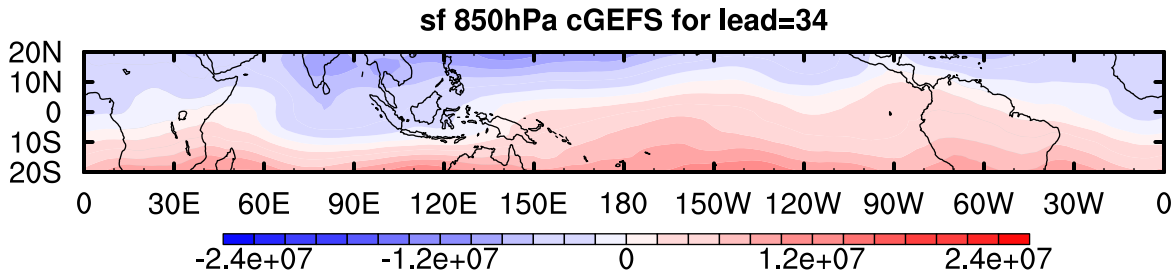
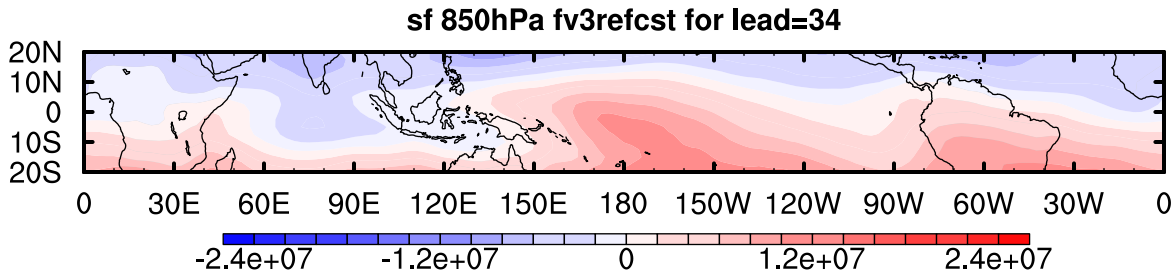
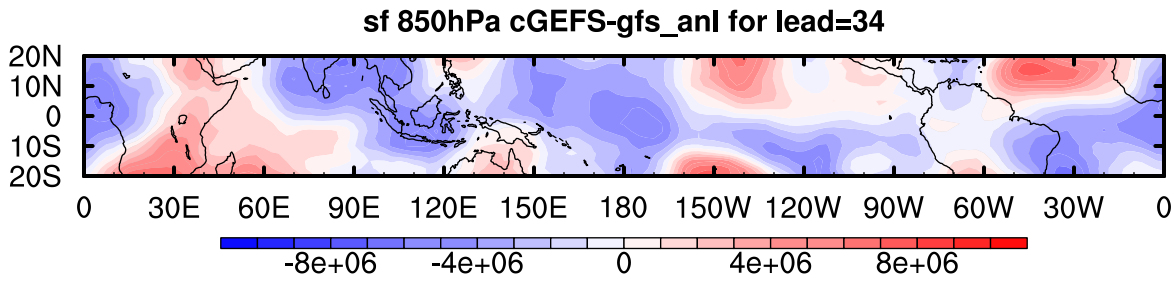
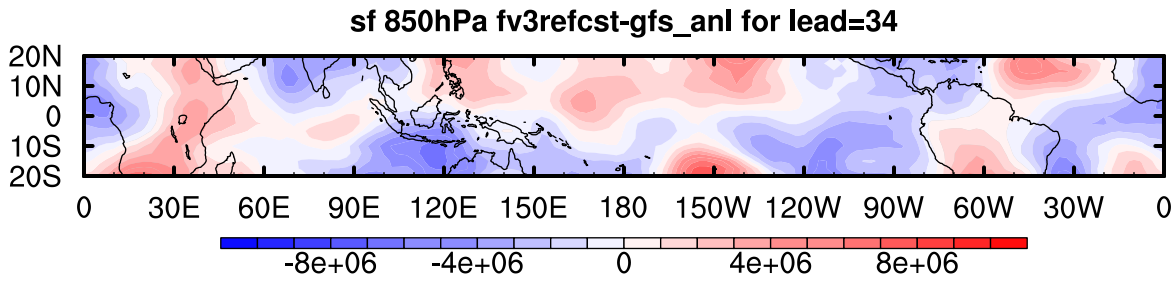
-10
-8
-6
-4
-2
0
2
4
6
8
10

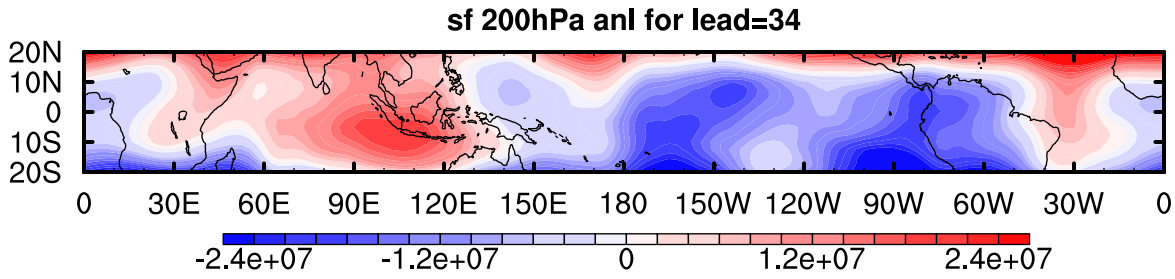

sf 850hPa anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 200hPa anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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150W
120W
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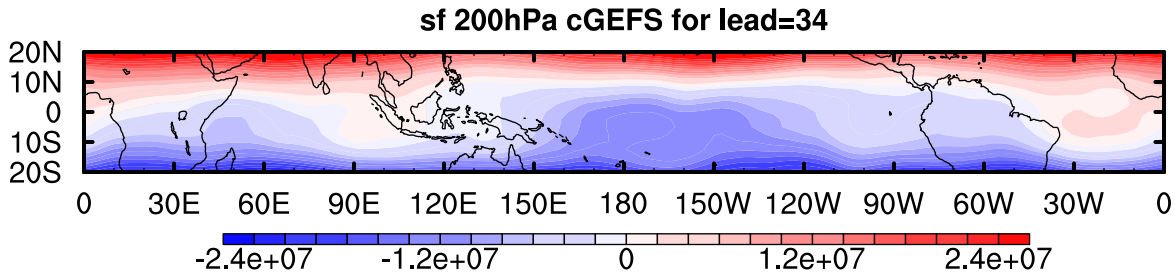
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa cGEFS for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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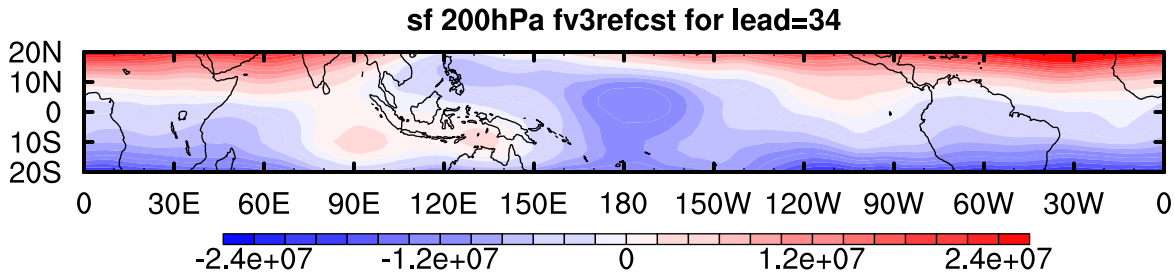
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 200hPa fv3refcst for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
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60W
30W
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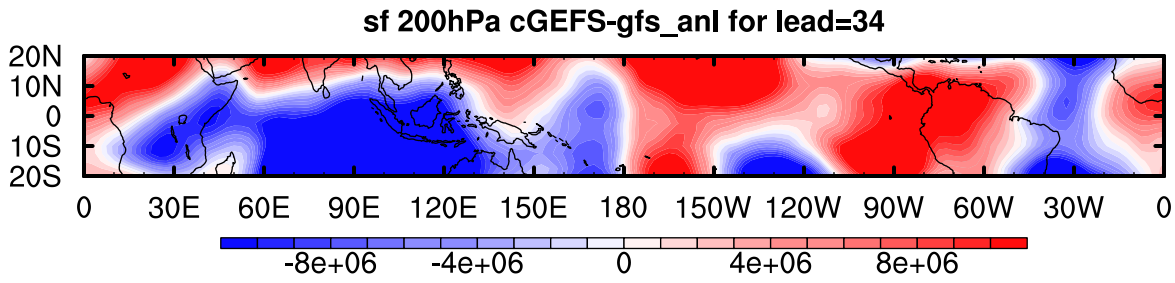
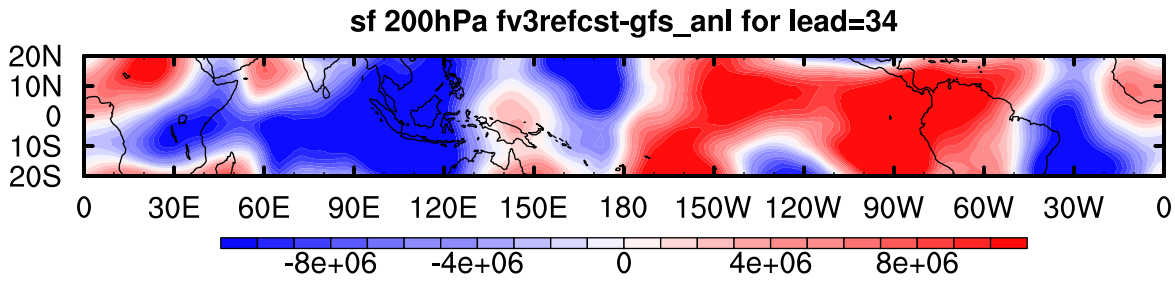
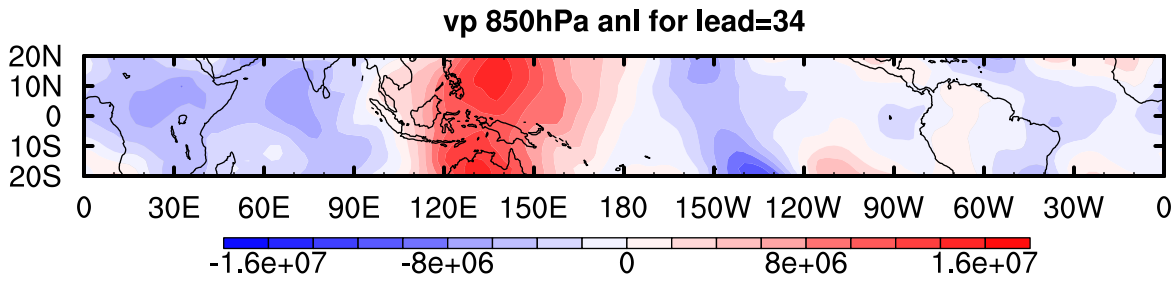
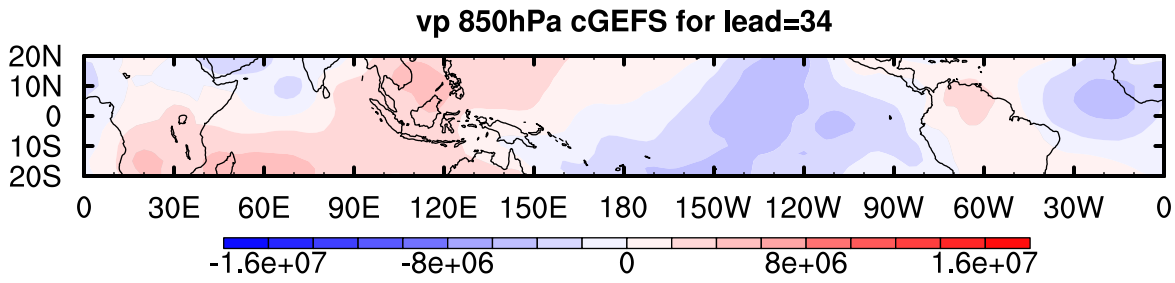
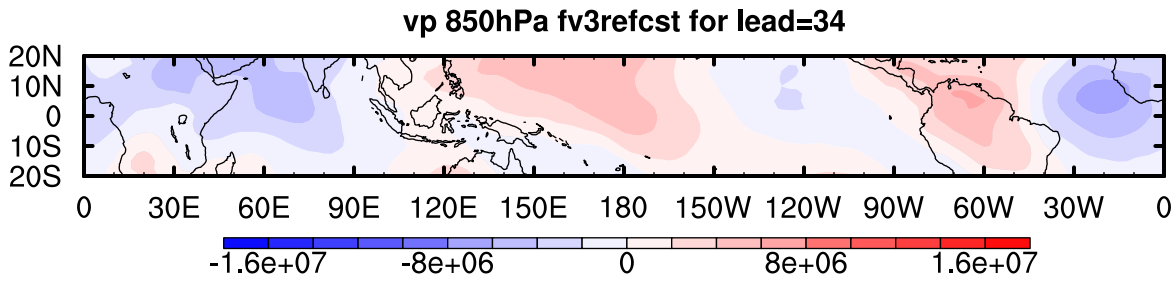
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

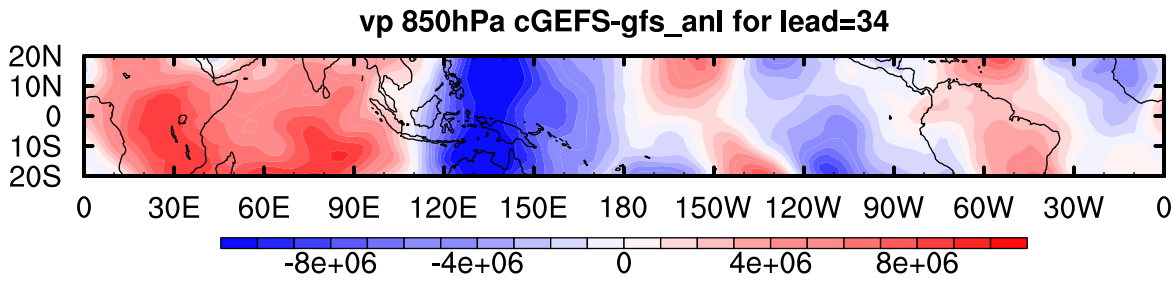

sf 200hPa cGEFS-gfs_anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

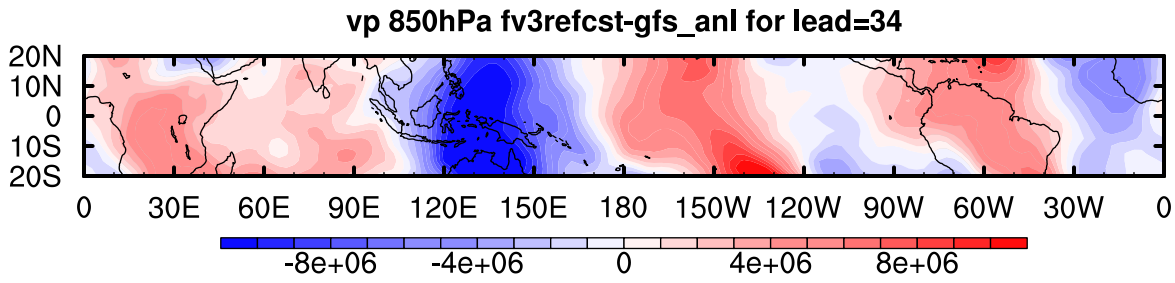

sf 200hPa fv3refcst-gfs_anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

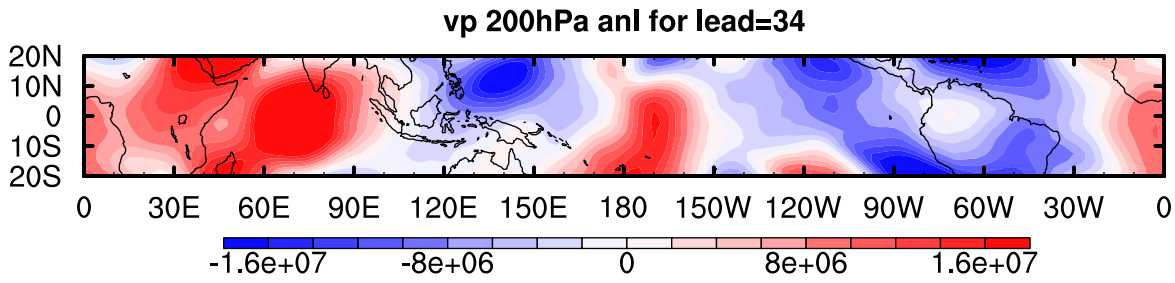

vp 850hPa anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

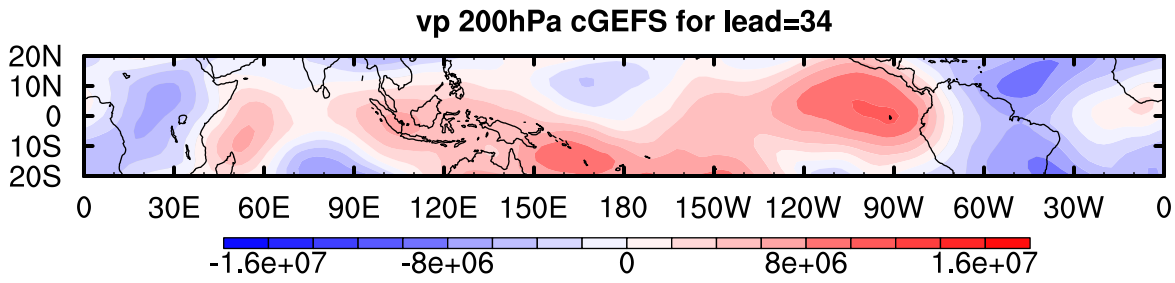

vp 850hPa cGEFS for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

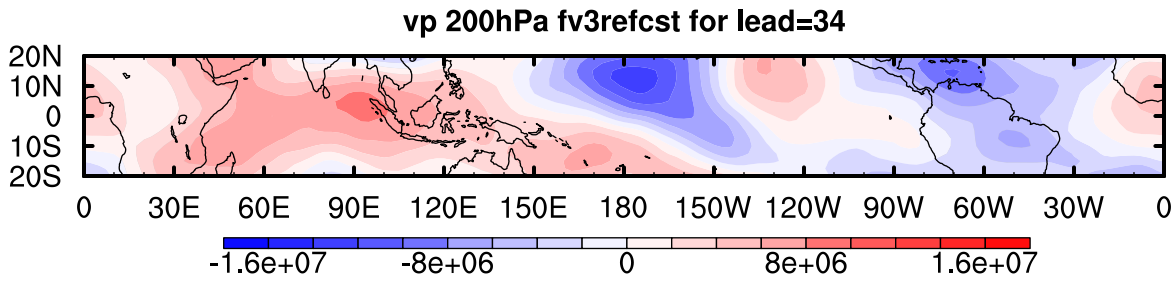

vp 850hPa fv3refcst for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

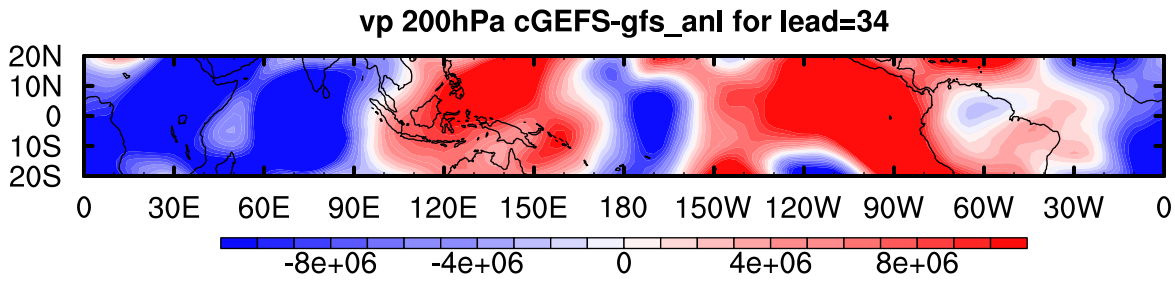

vp 850hPa cGEFS-gfs_anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

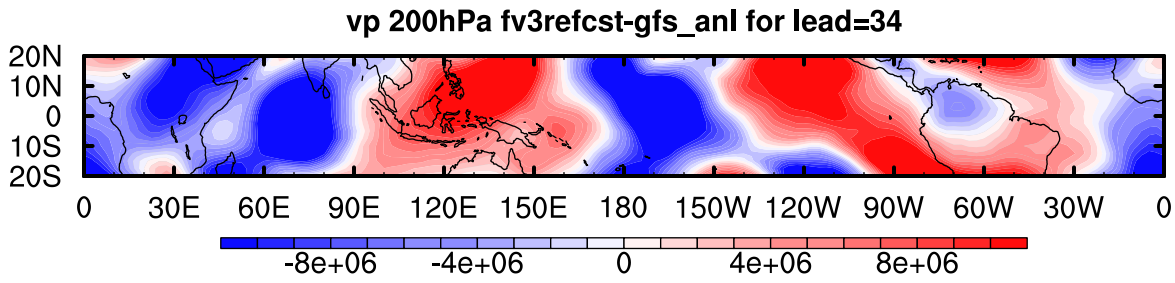

vp 850hPa fv3refcst-gfs_anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

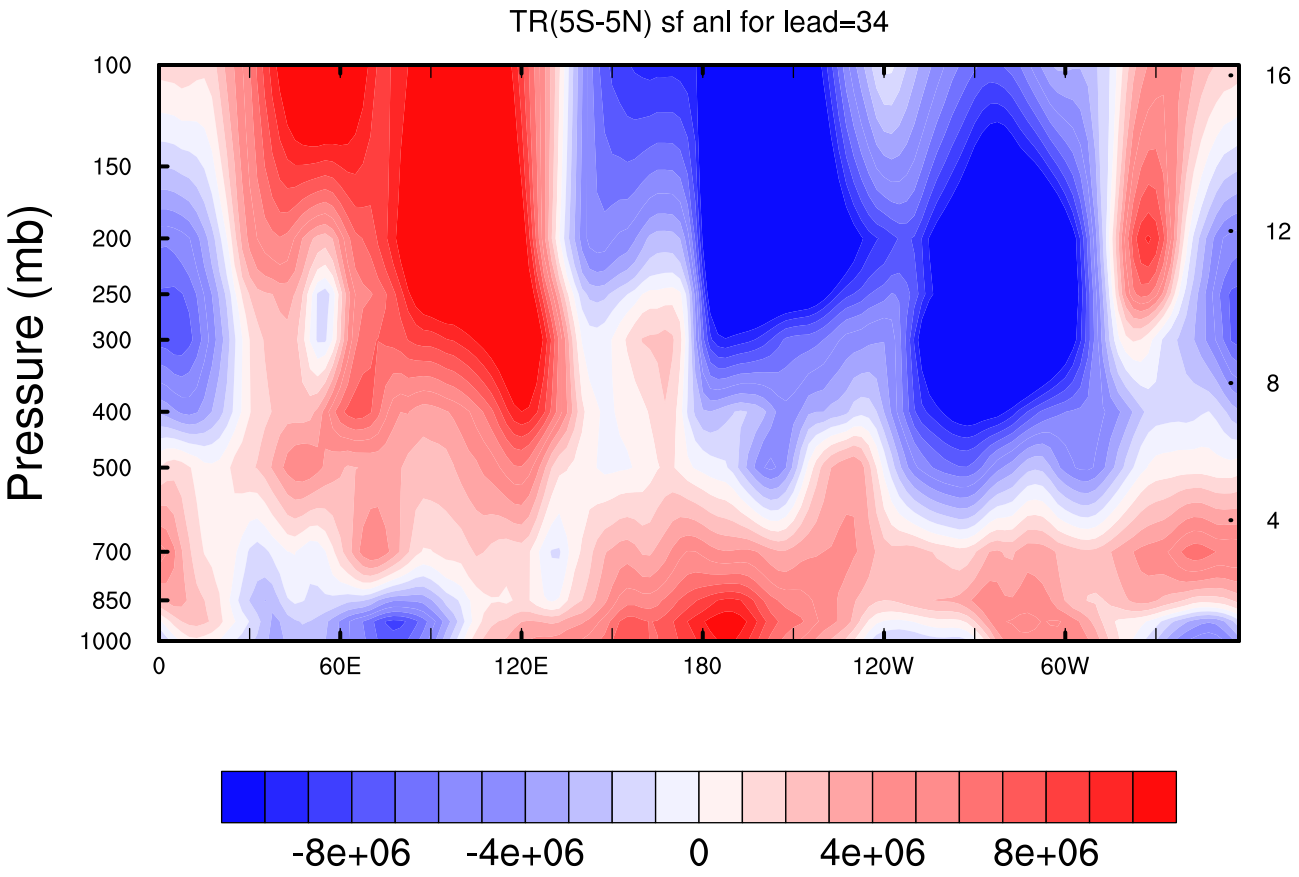

vp 200hPa anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

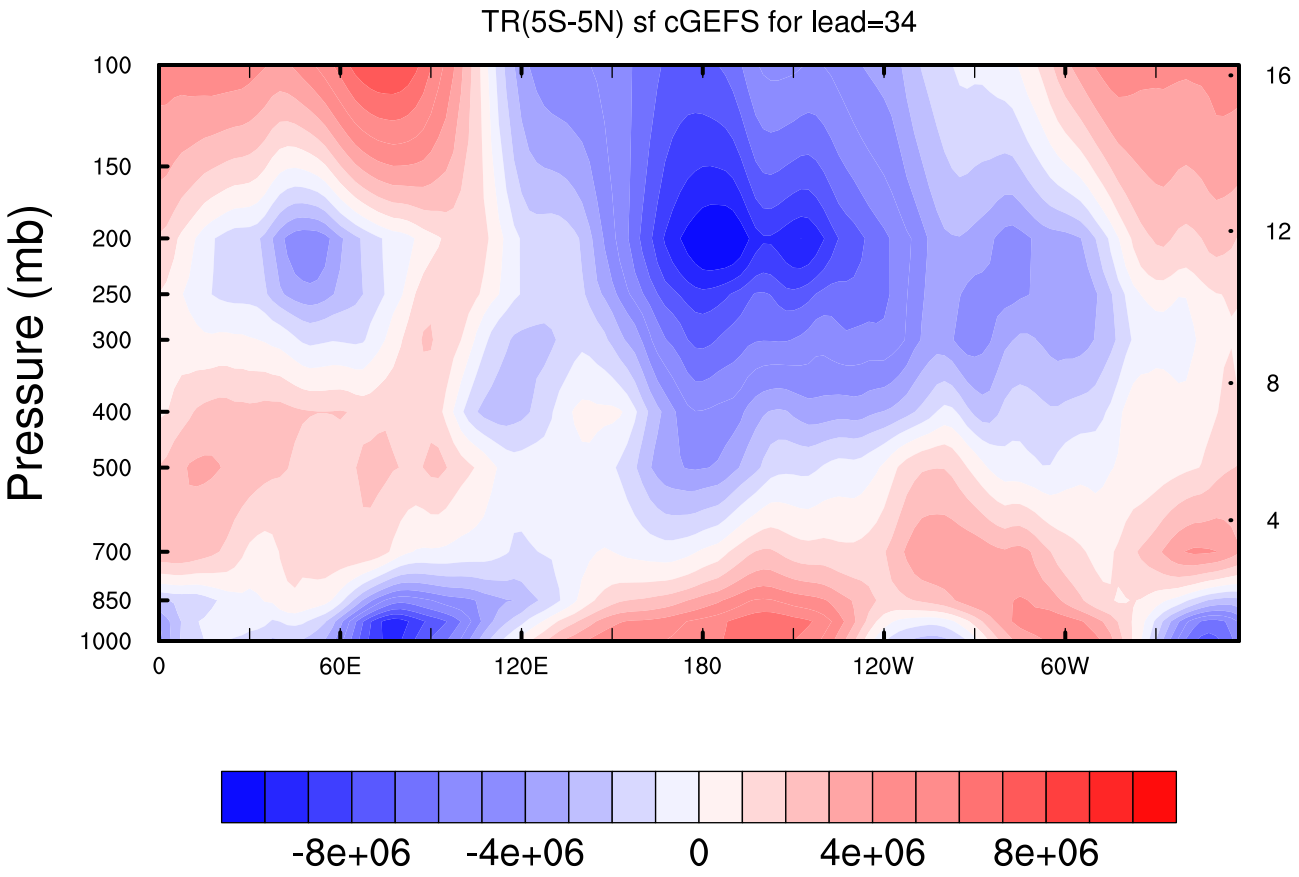

vp 200hPa cGEFS for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

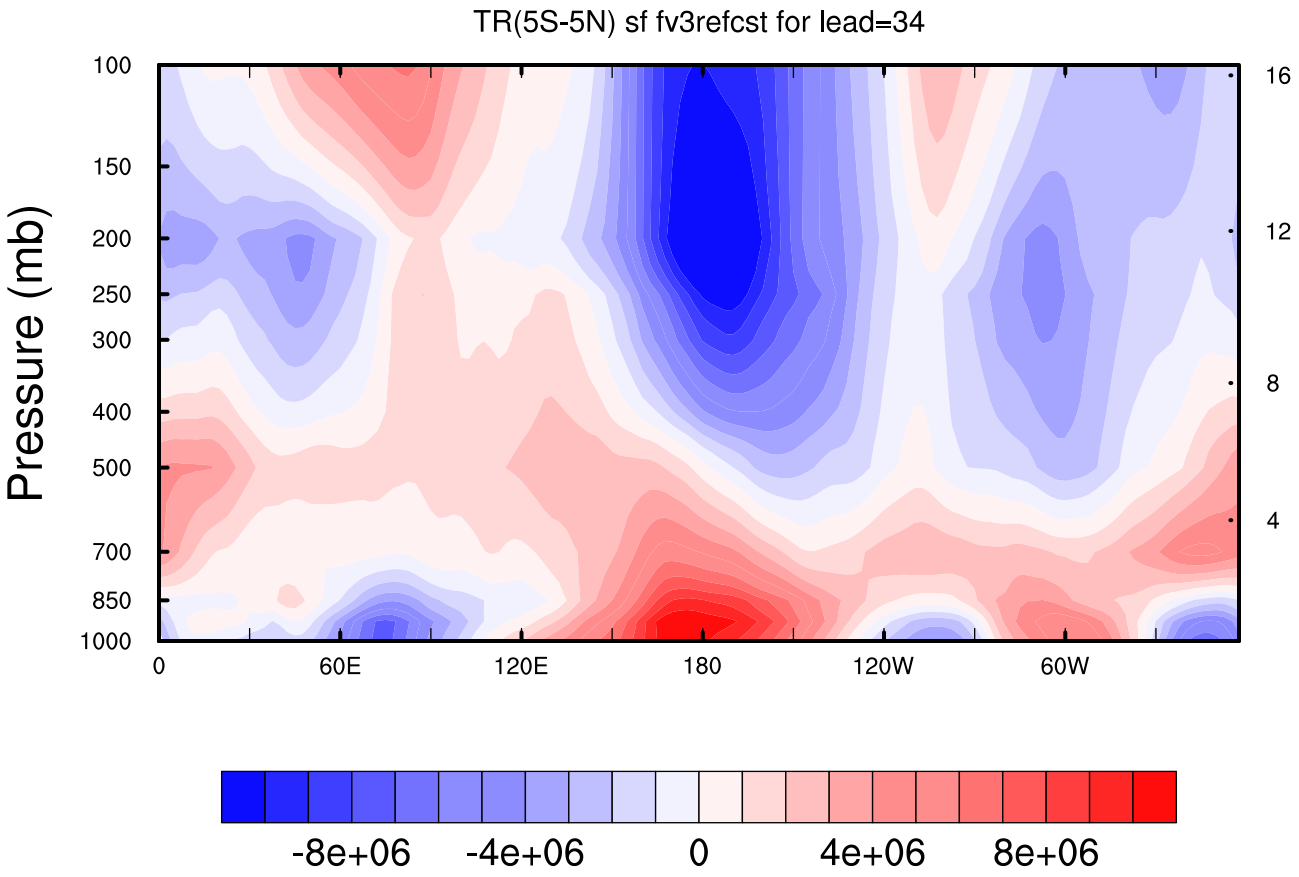

vp 200hPa fv3refcst for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

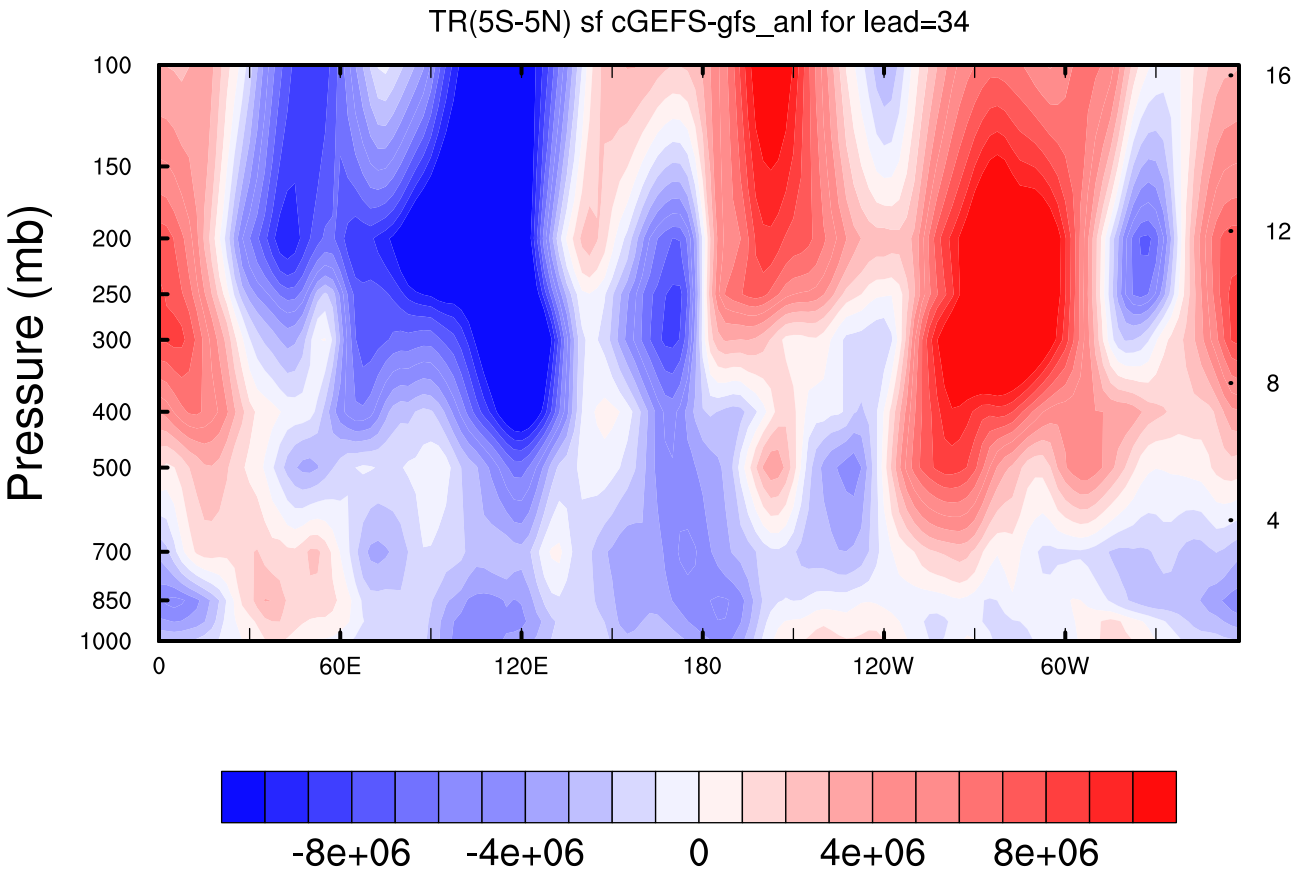

vp 200hPa cGEFS-gfs_anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

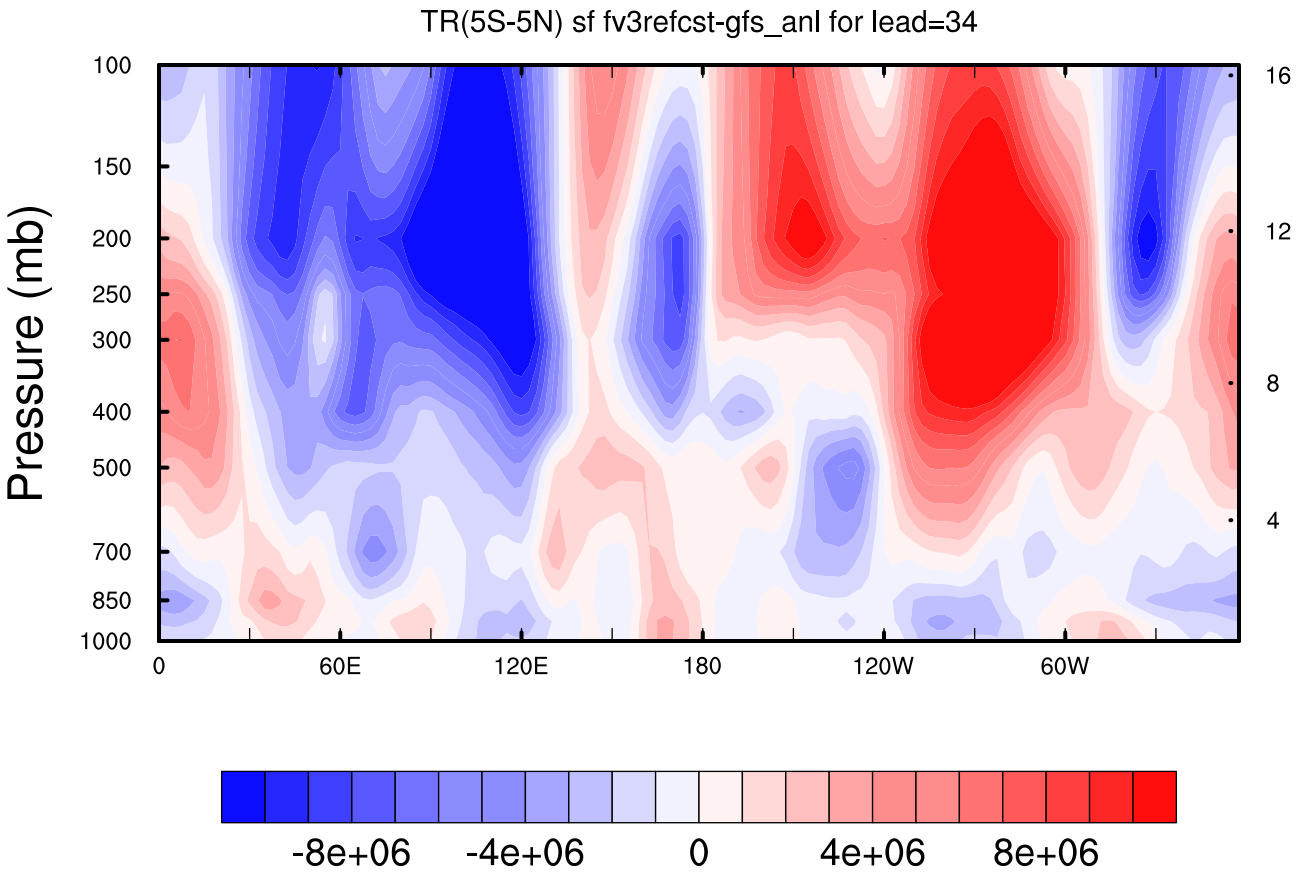

vp 200hPa fv3refcst-gfs_anl for lead=34
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

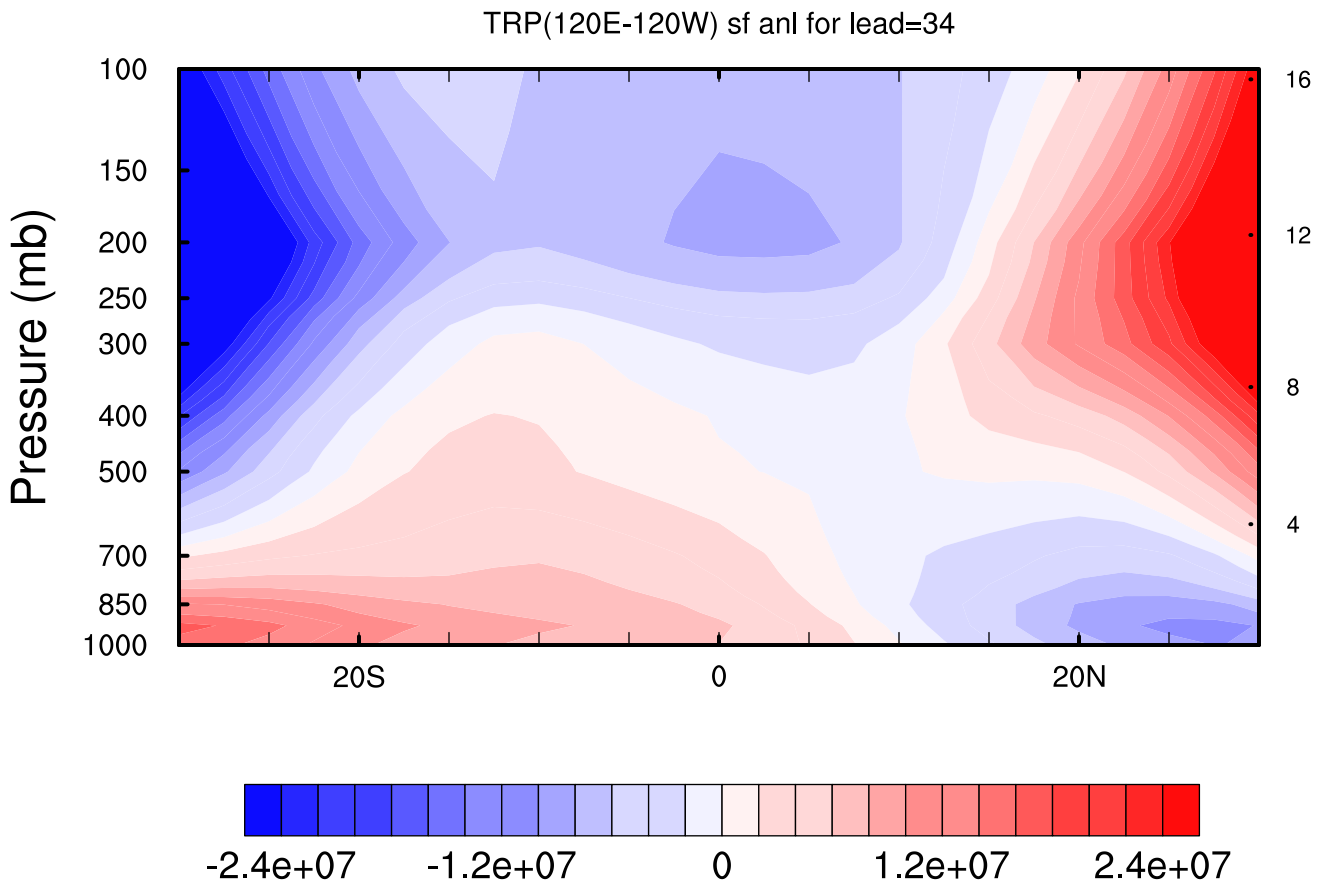

TR(5S-5N) sf anl for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

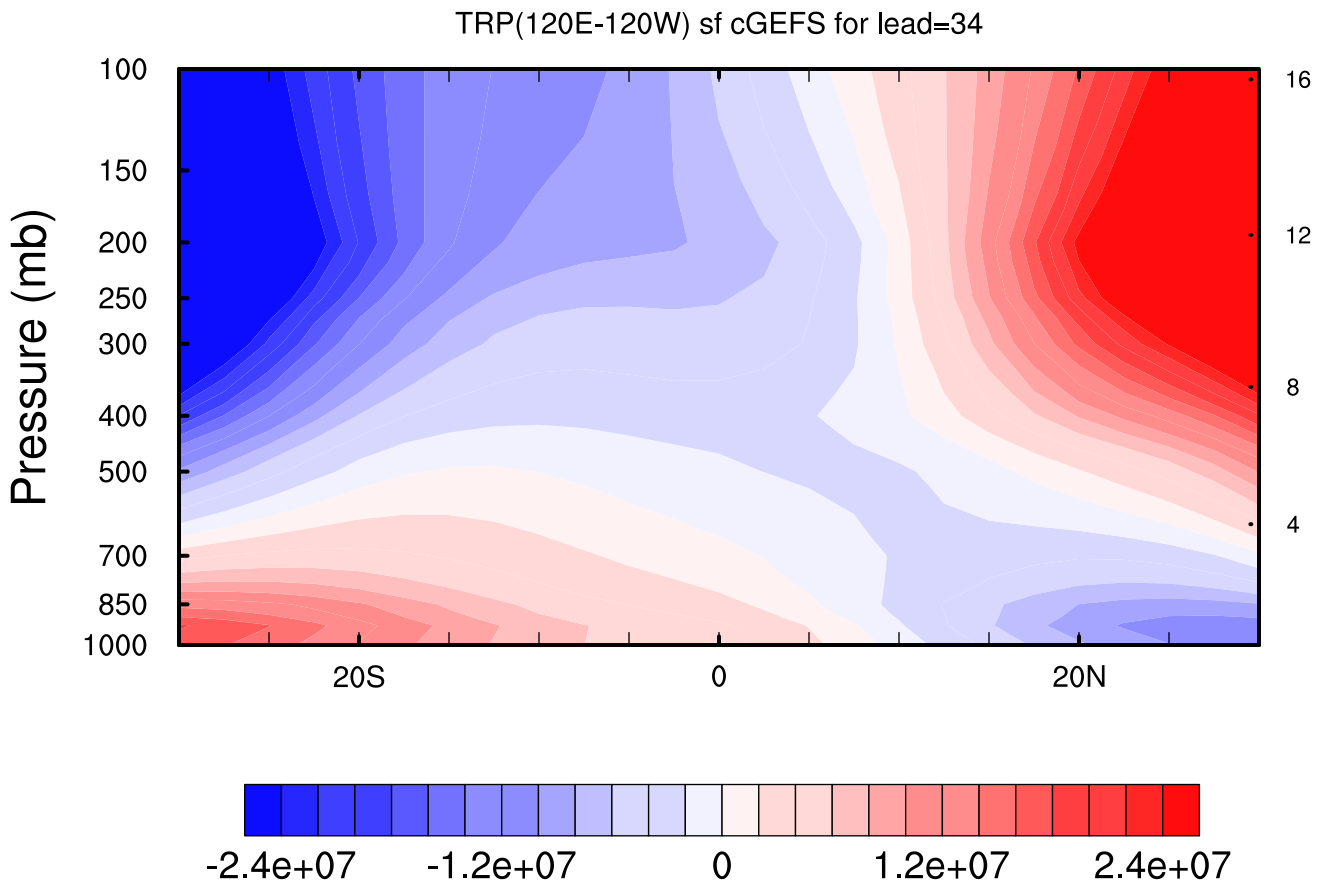

TR(5S-5N) sf cGEFS for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

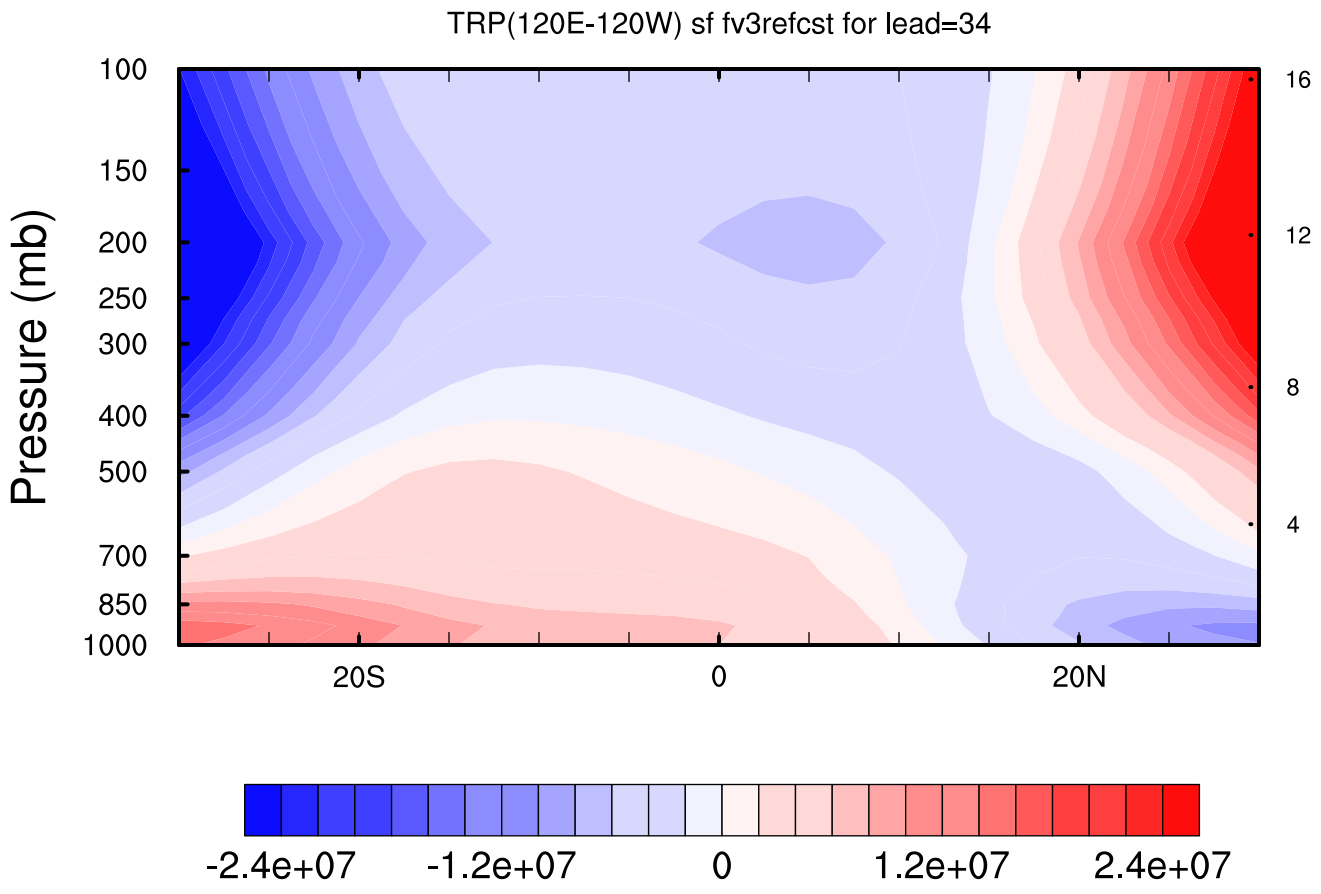

TR(5S-5N) sf fv3refcst for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

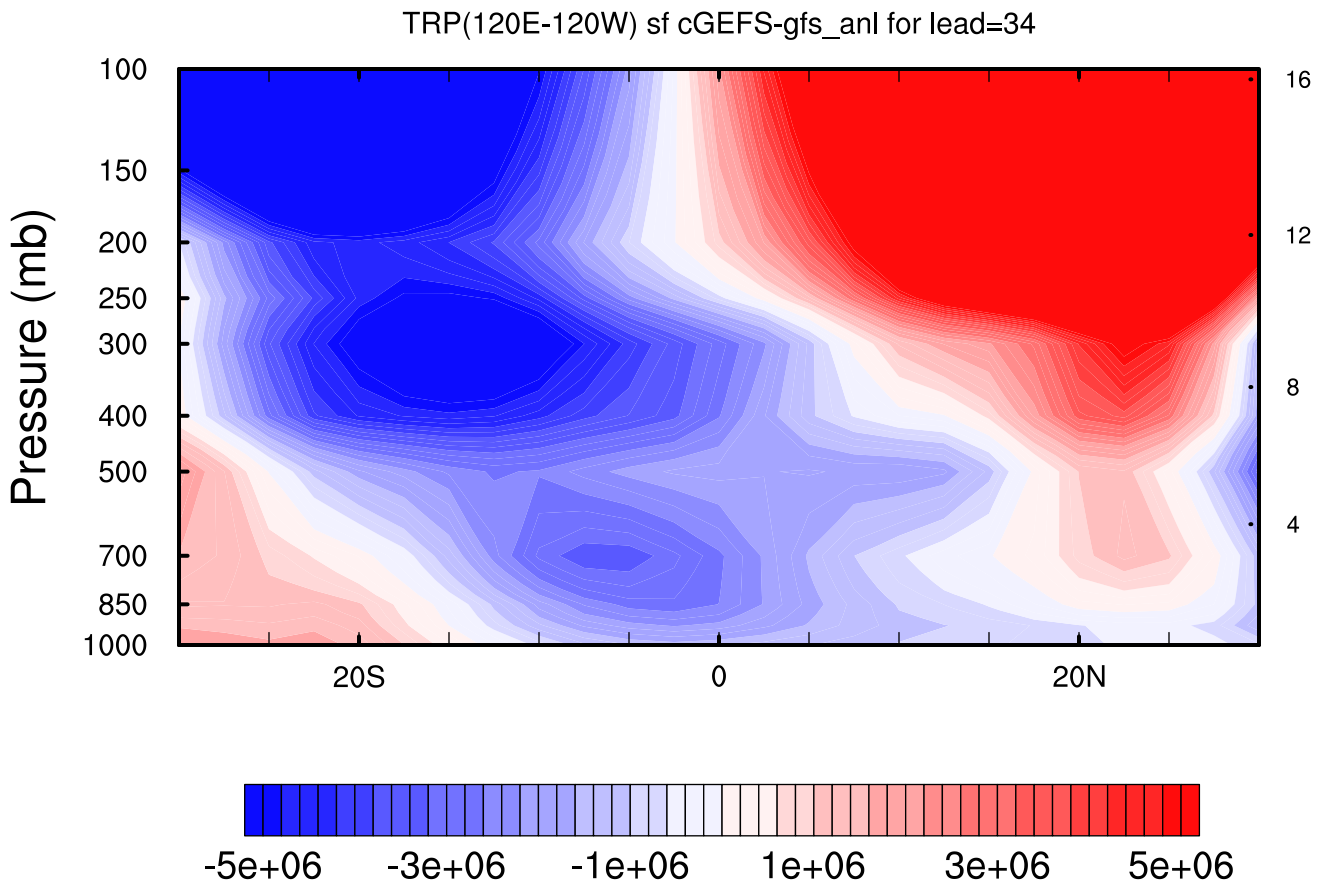

TR(5S-5N) sf cGEFS-gfs_anl for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

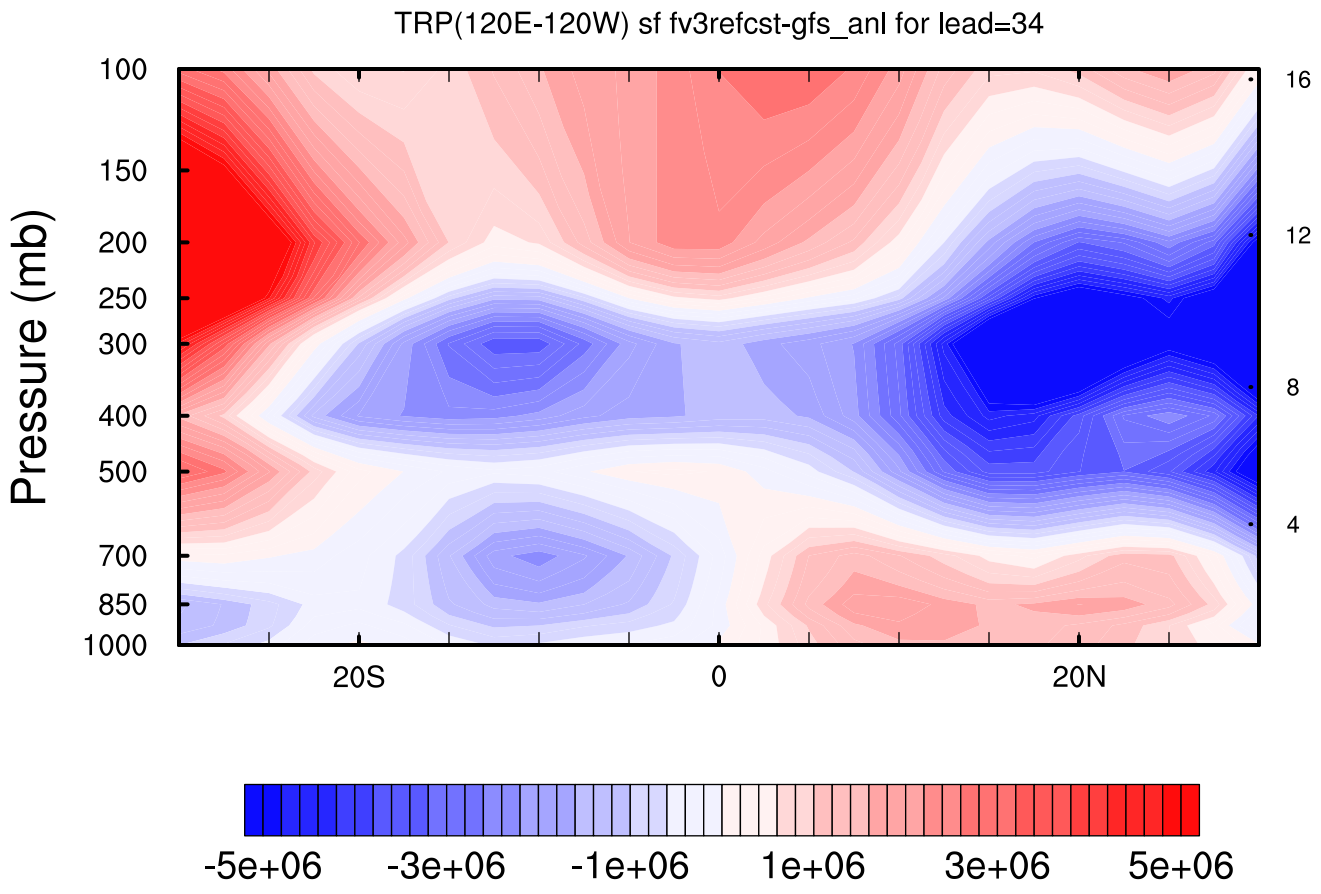

TR(5S-5N) sf fv3refcst-gfs_anl for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

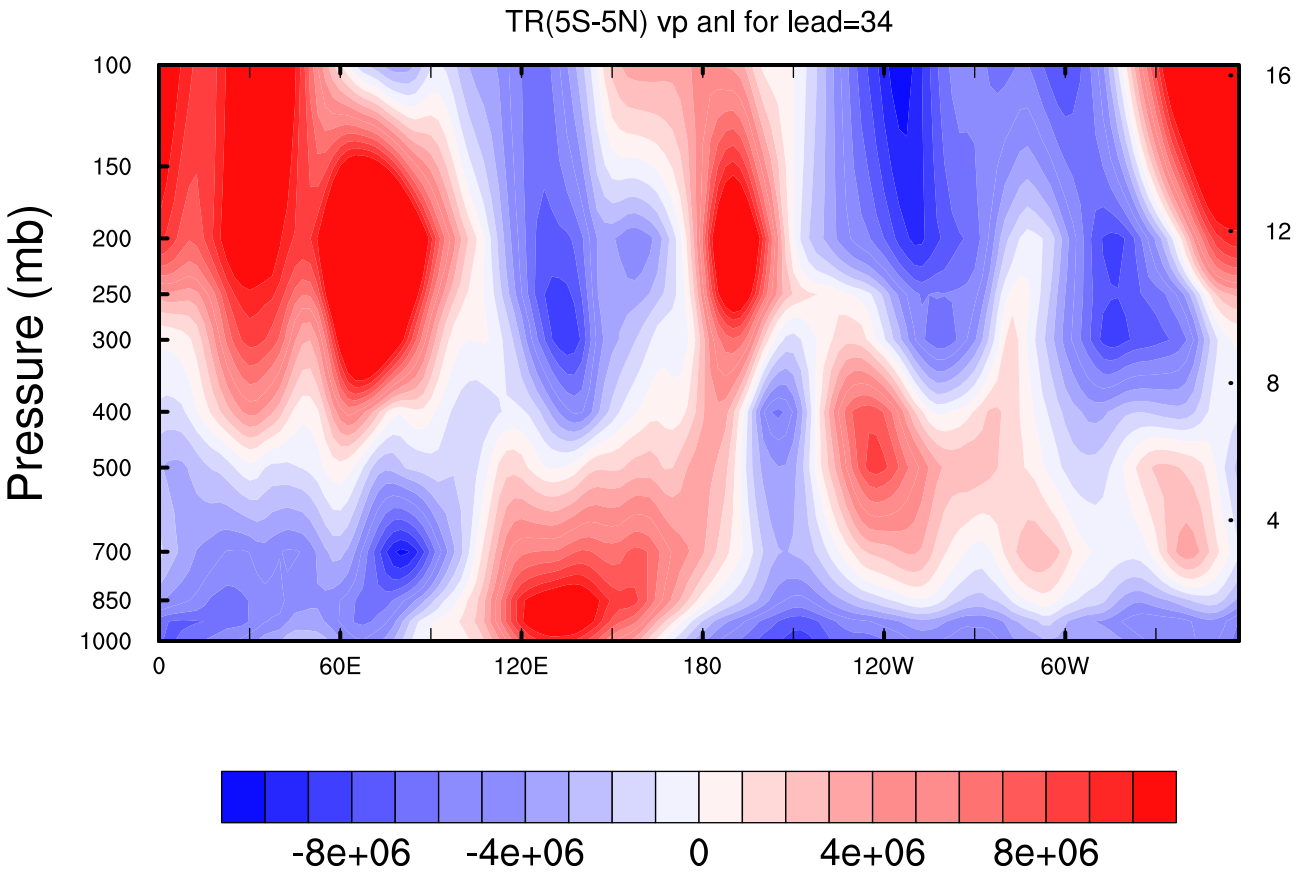

TRP(120E-120W) sf anl for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

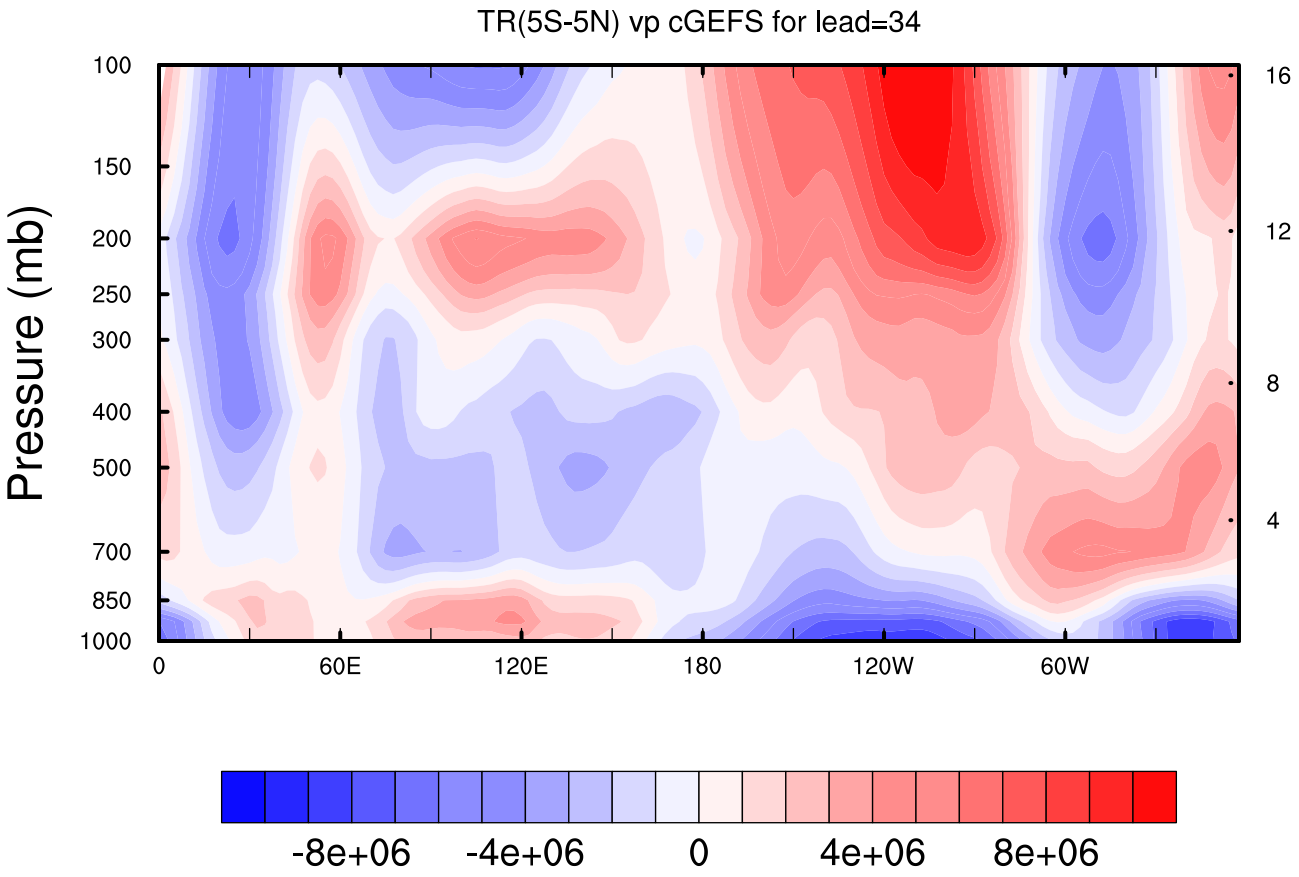

TRP(120E-120W) sf cGEFS for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

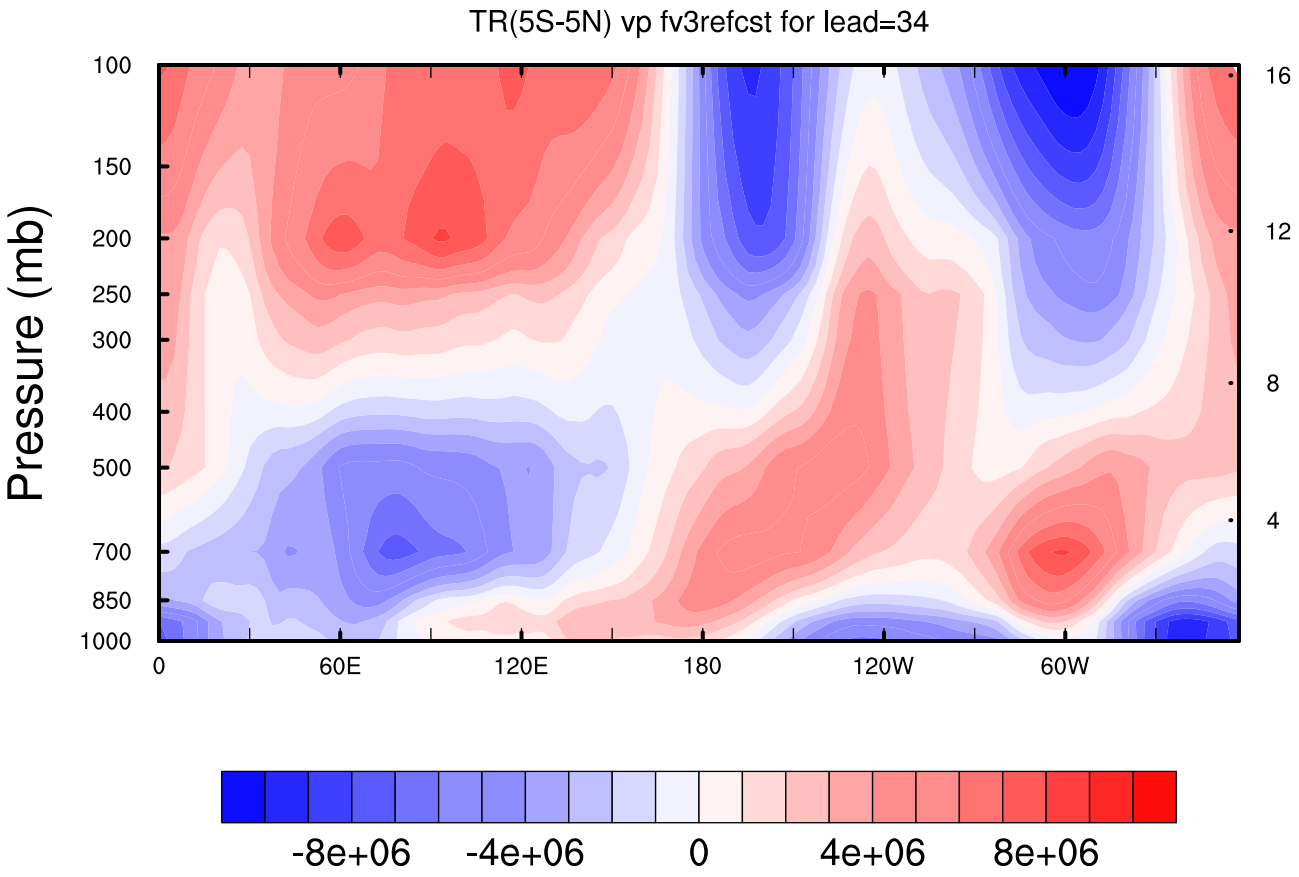

TRP(120E-120W) sf fv3refcst for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

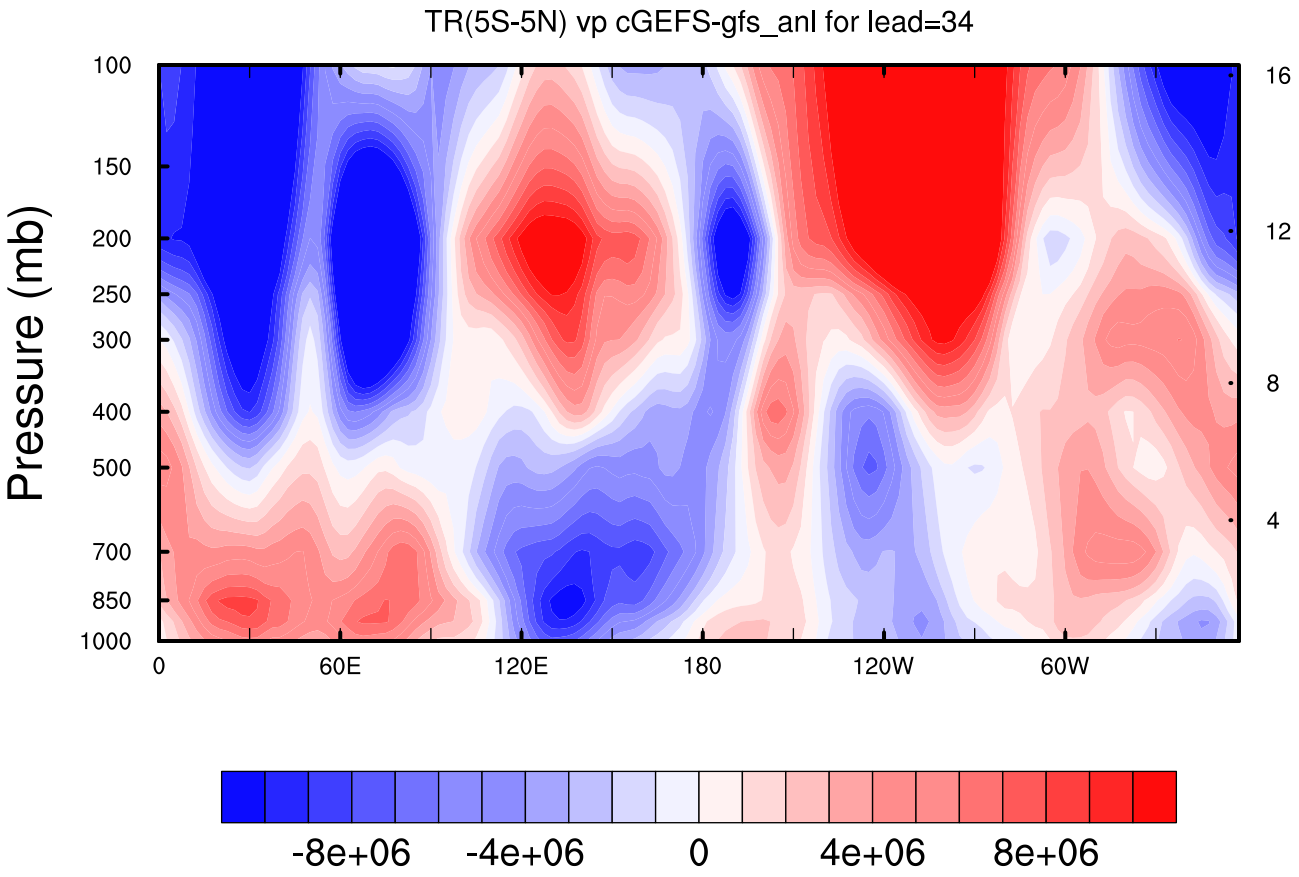

TRP(120E-120W) sf cGEFS-gfs_anl for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

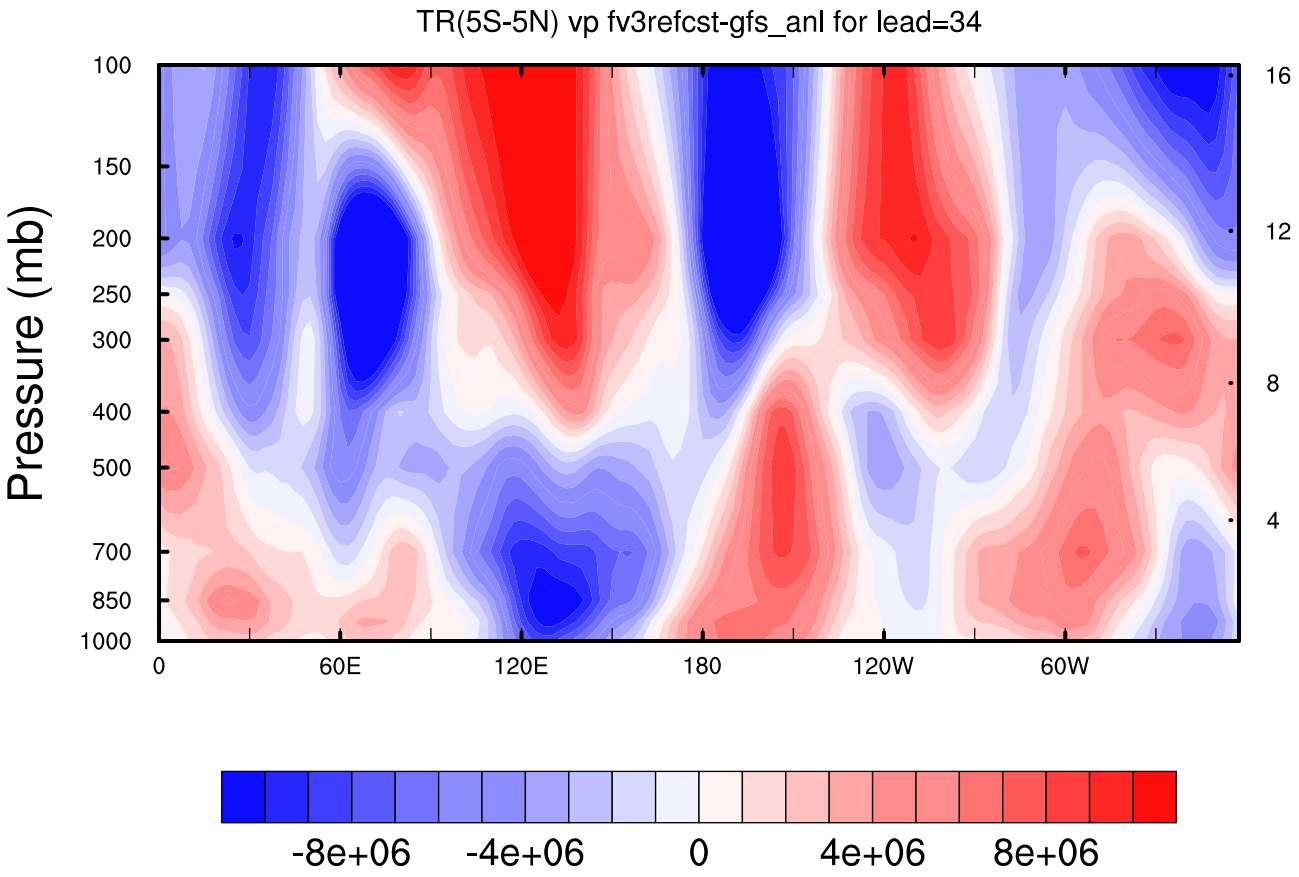

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

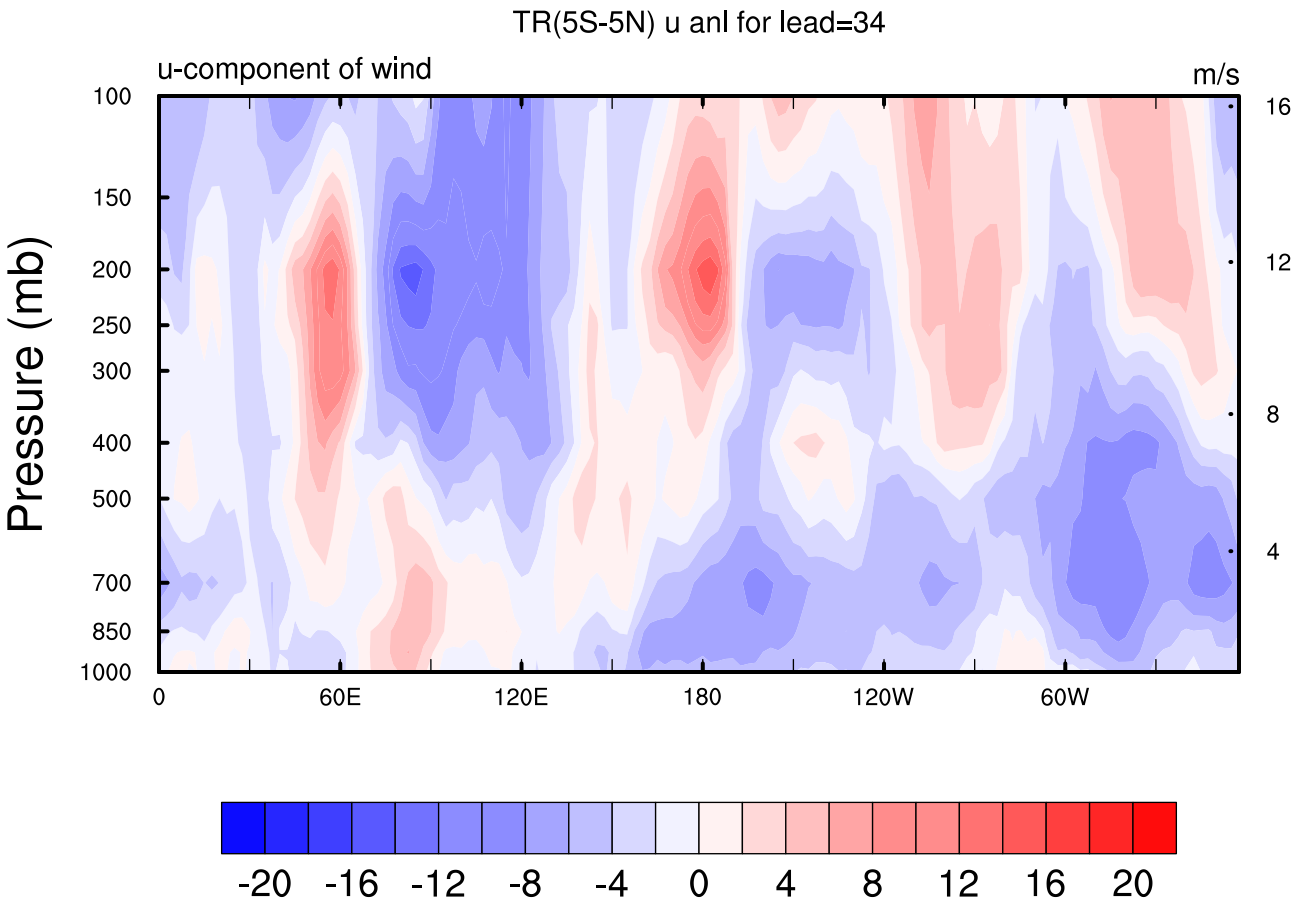

TR(5S-5N) vp anl for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

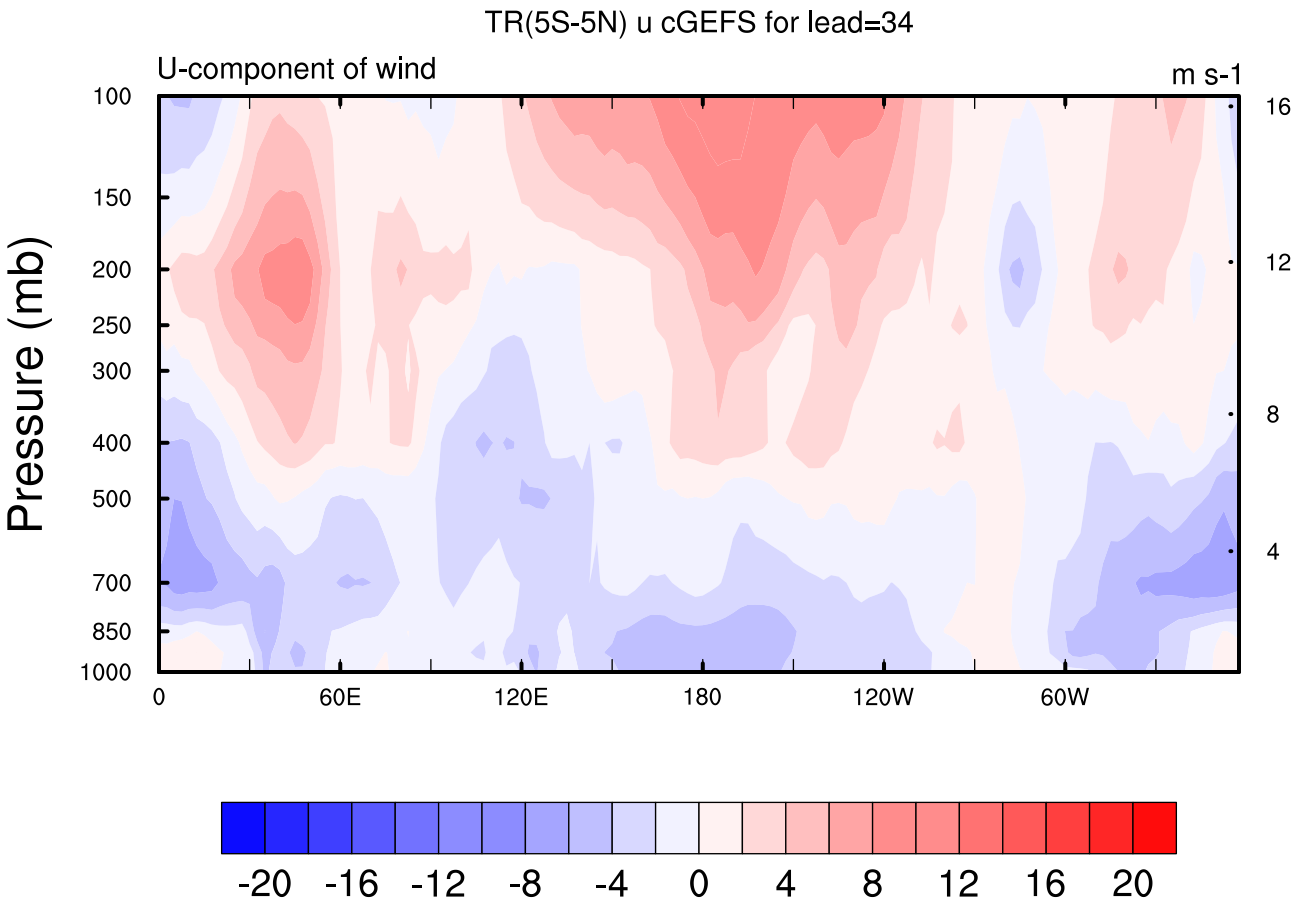

TR(5S-5N) vp cGEFS for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

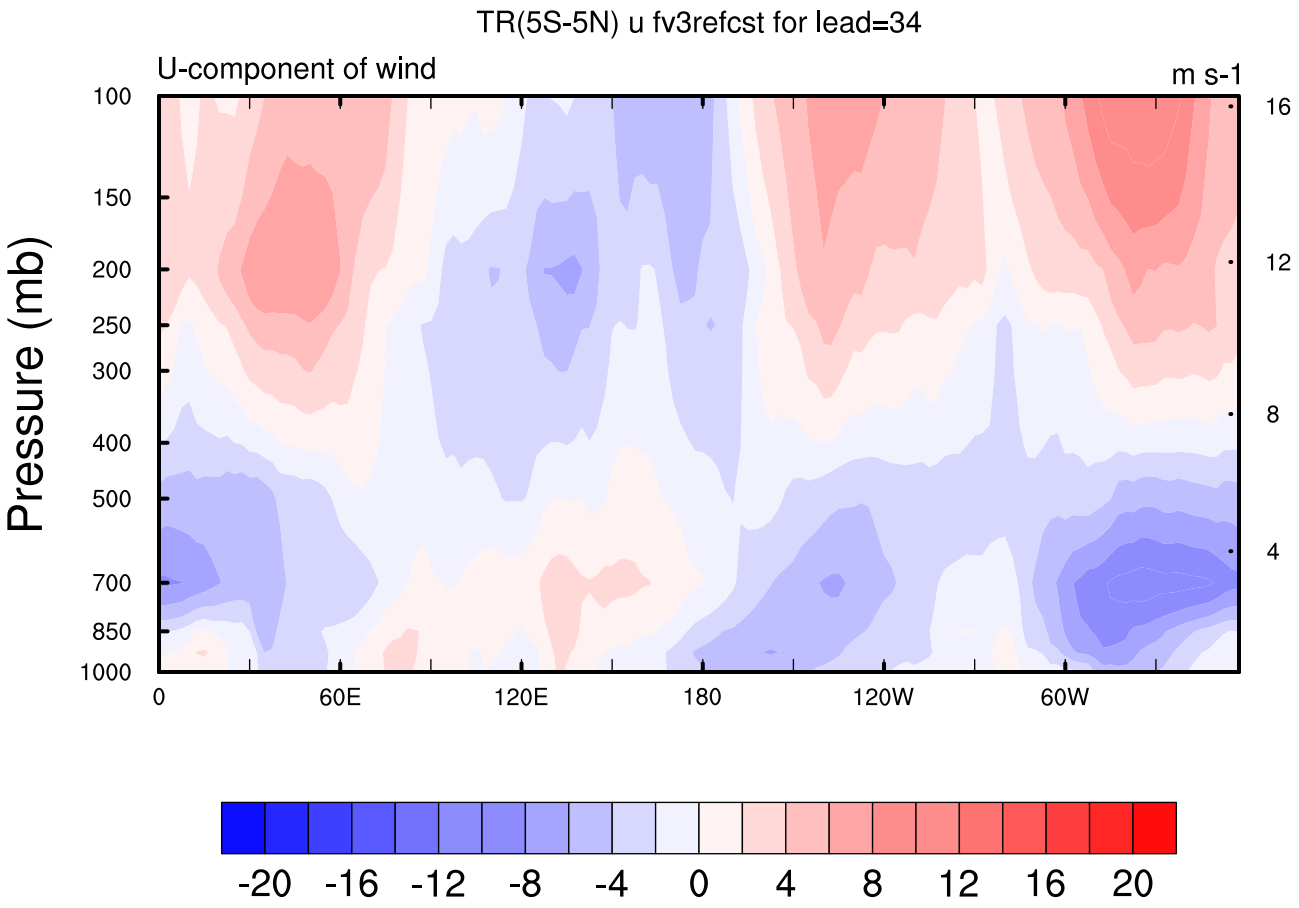

TR(5S-5N) vp fv3refcst for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

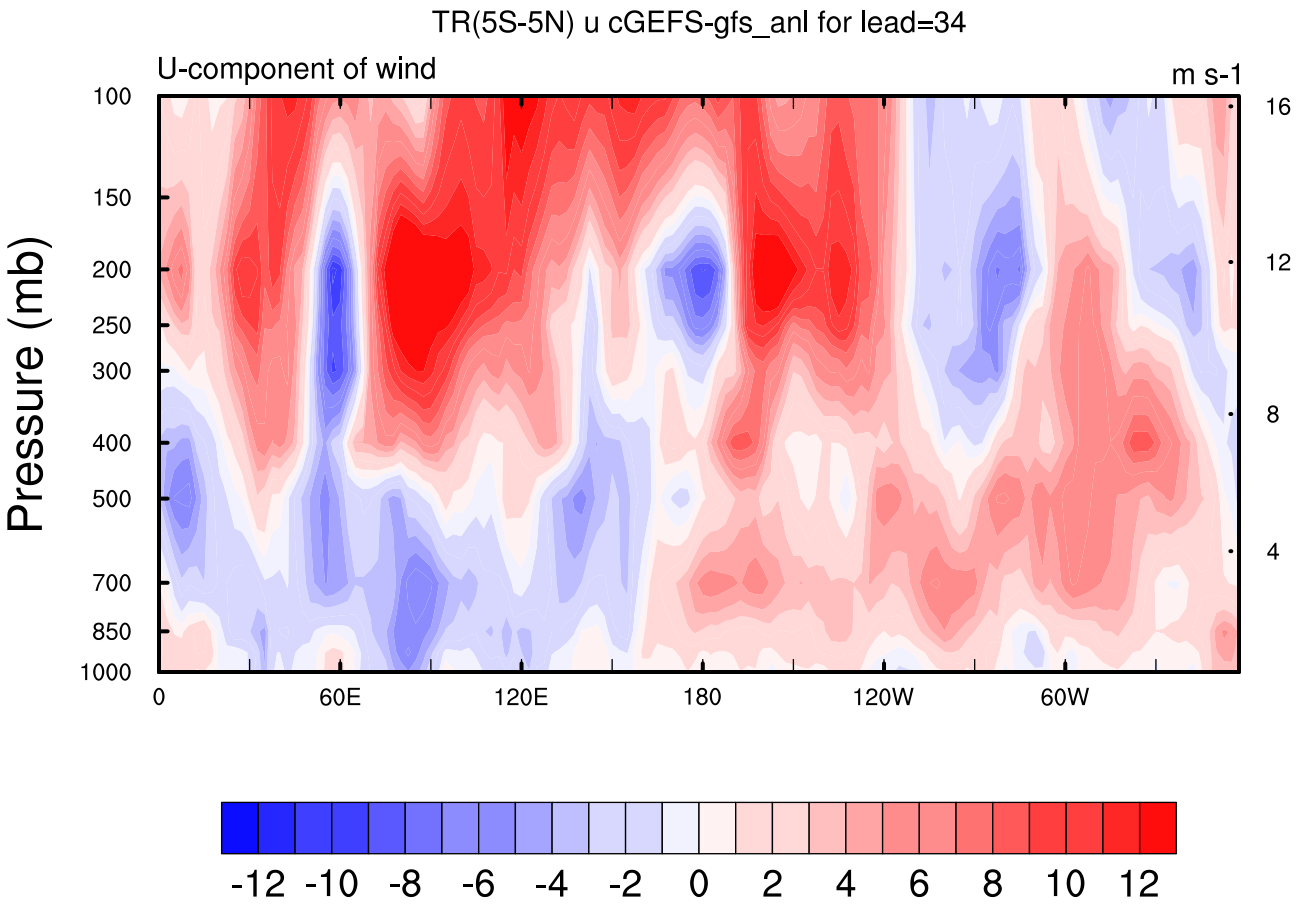

TR(5S-5N) vp cGEFS-gfs_anl for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

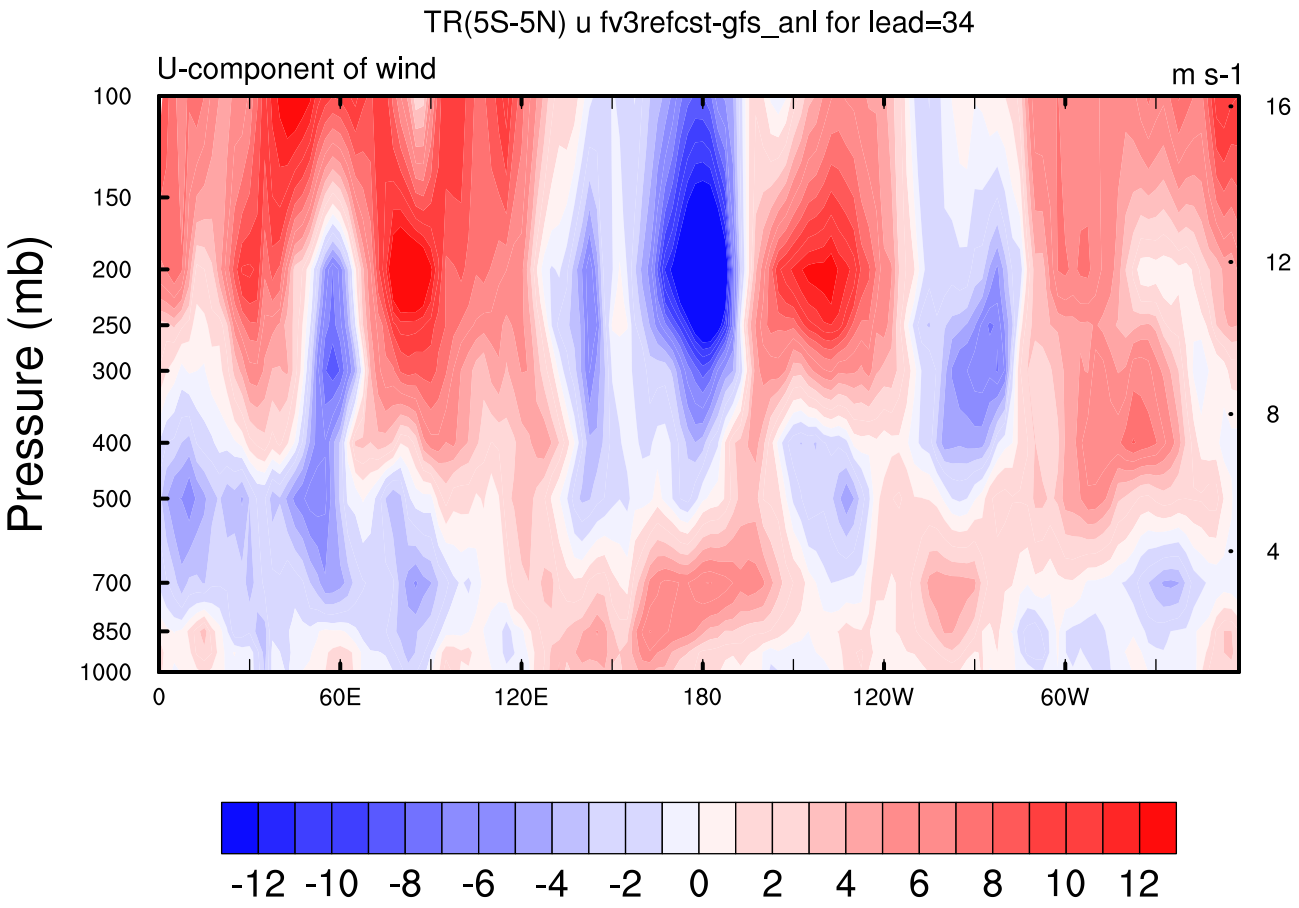

TR(5S-5N) vp fv3refcst-gfs_anl for lead=34
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

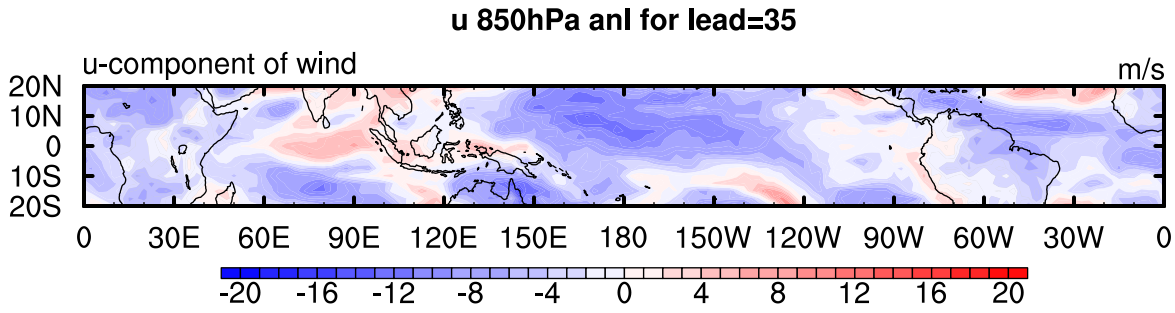

TR(5S-5N) u anl for lead=34
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

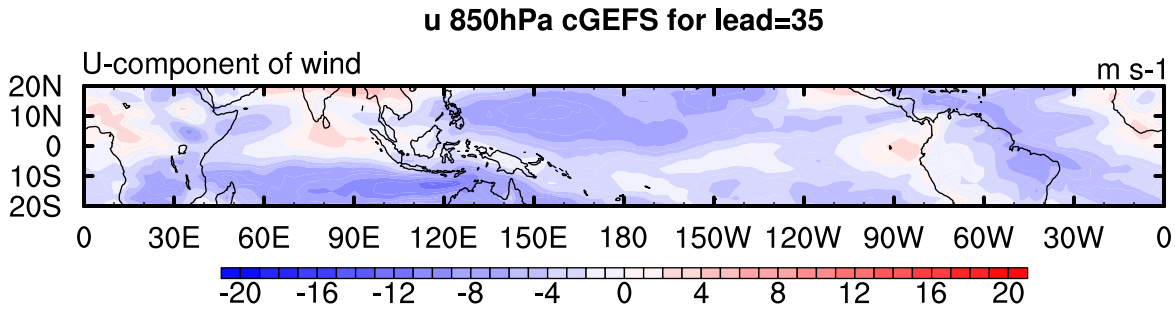

TR(5S-5N) u cGEFS for lead=34
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

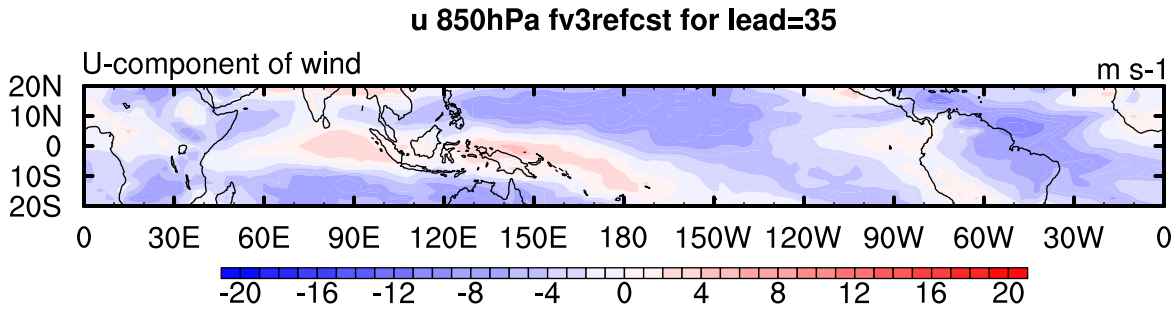

TR(5S-5N) u fv3refcst for lead=34
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20

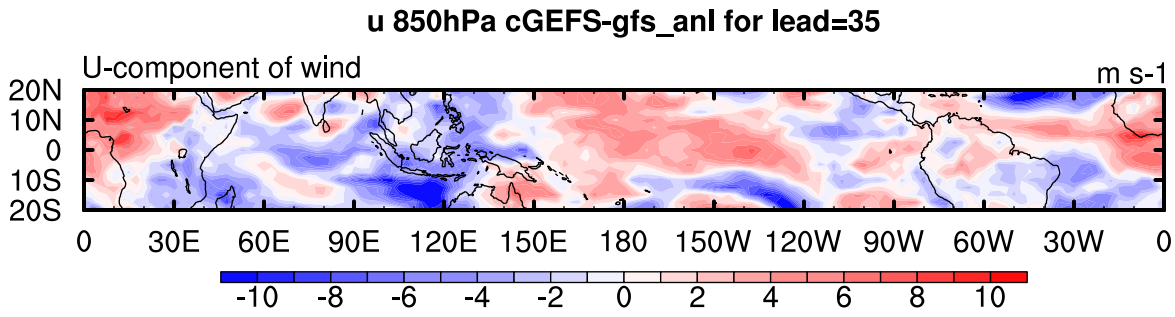

TR(5S-5N) u cGEFS-gfs_anl for lead=34
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

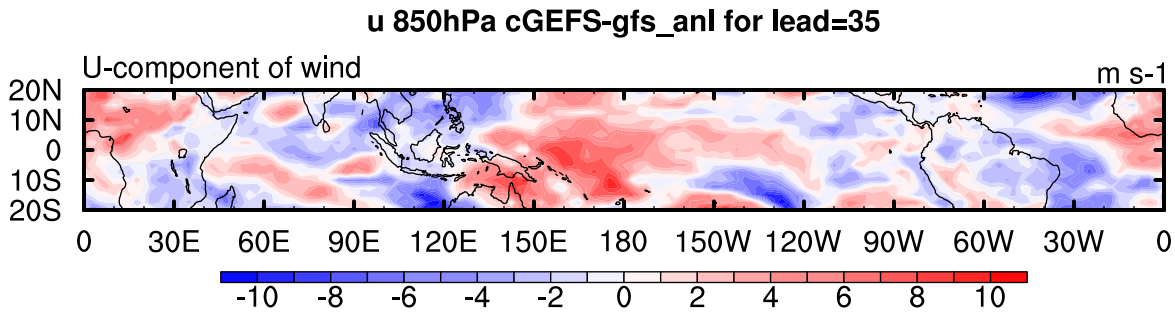

TR(5S-5N) u fv3refcst-gfs_anl for lead=34
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12

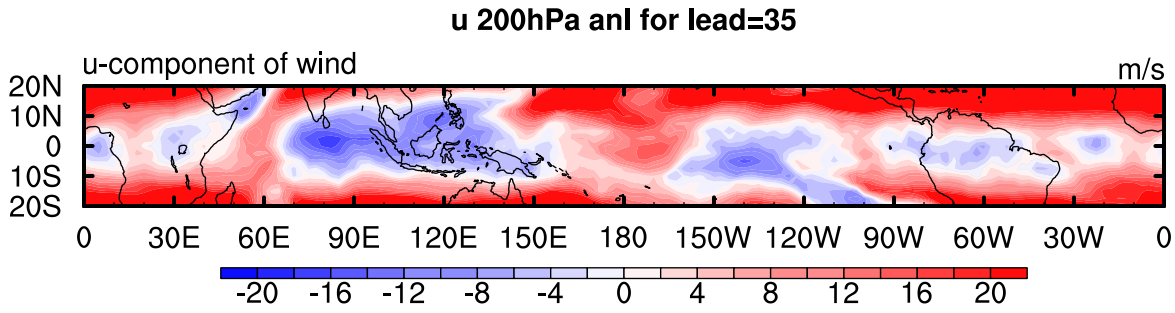

u 850hPa anl for lead=35
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

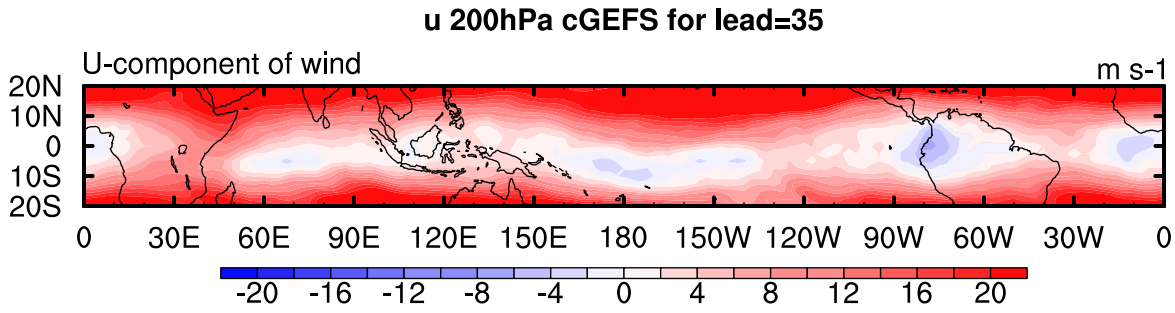

u 850hPa cGEFS for lead=35
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

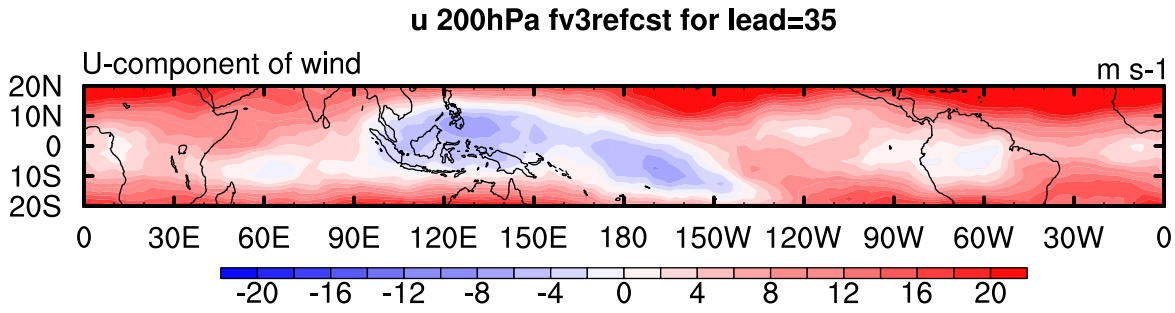

u 850hPa fv3refcst for lead=35
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

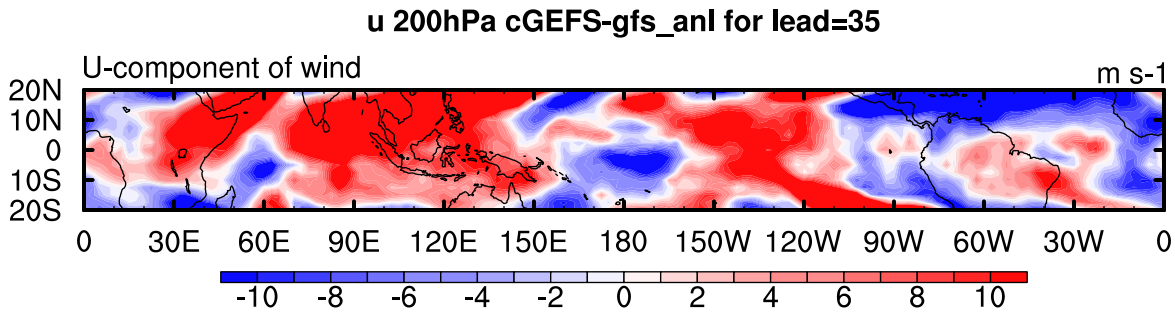

u 850hPa cGEFS-gfs_anl for lead=35
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

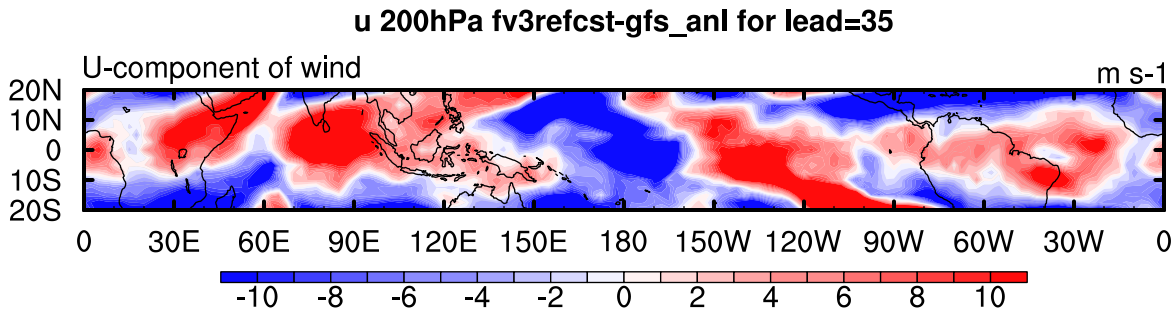

u 850hPa cGEFS-gfs_anl for lead=35
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

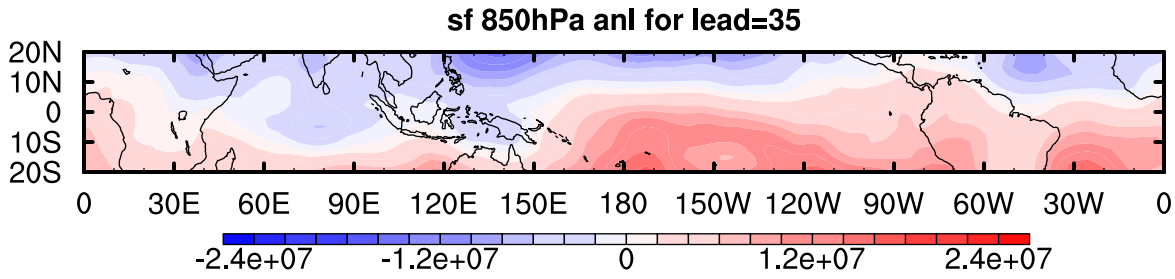

u 200hPa anl for lead=35
u-component of wind
m/s
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

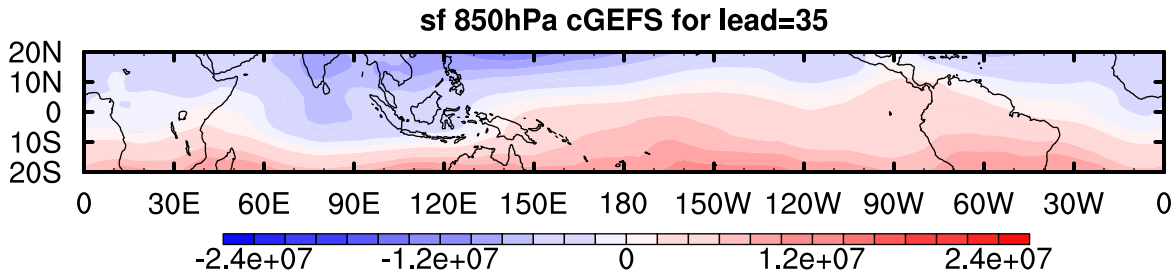

u 200hPa cGEFS for lead=35
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

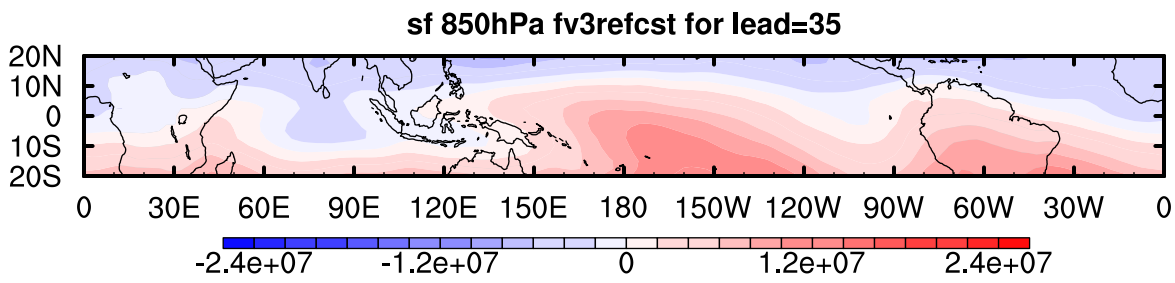

u 200hPa fv3refcst for lead=35
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-20
-16
-12
-8
-4
0
4
8
12
16
20

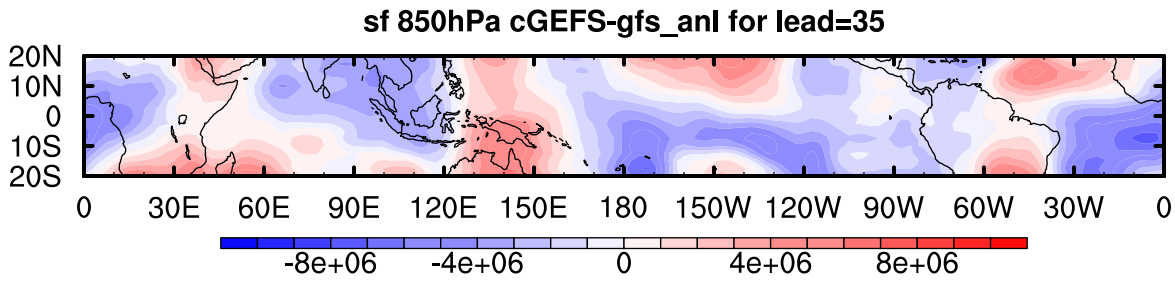

u 200hPa cGEFS-gfs_anl for lead=35
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10

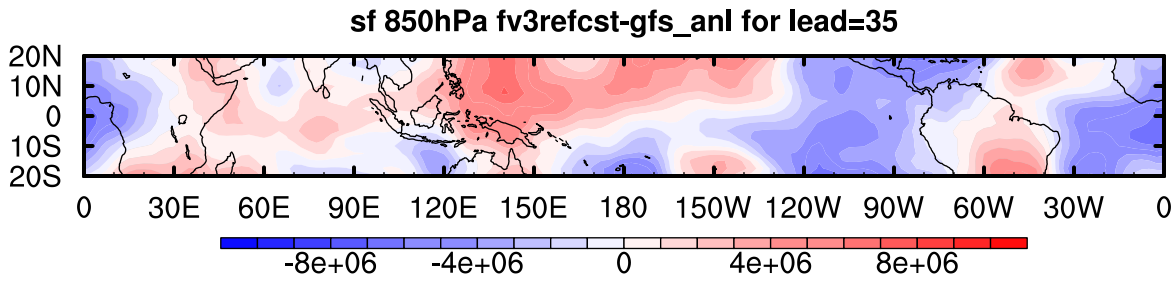

u 200hPa fv3refcst-gfs_anl for lead=35
U-component of wind
m s-1
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-10
-8
-6
-4
-2
0
2
4
6
8
10


sf 850hPa anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa fv3refcst for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07


sf 850hPa cGEFS-gfs_anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


sf 850hPa fv3refcst-gfs_anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
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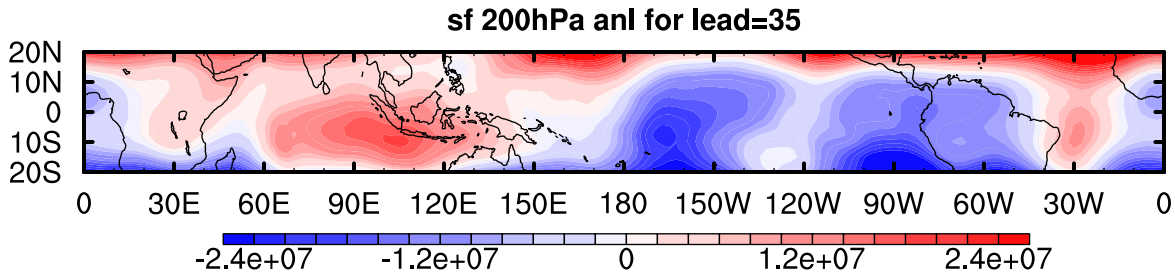
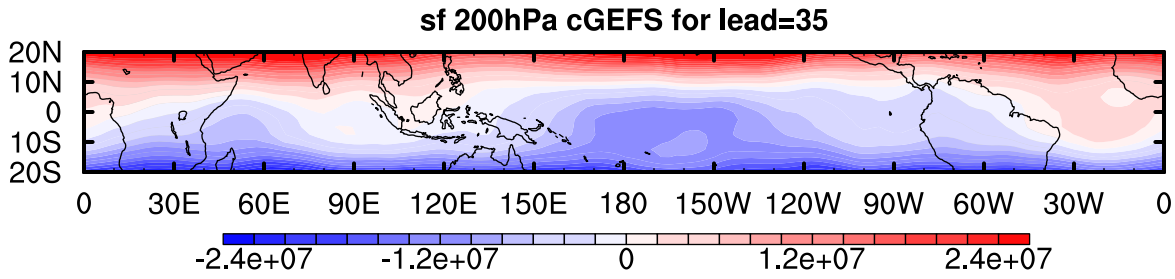
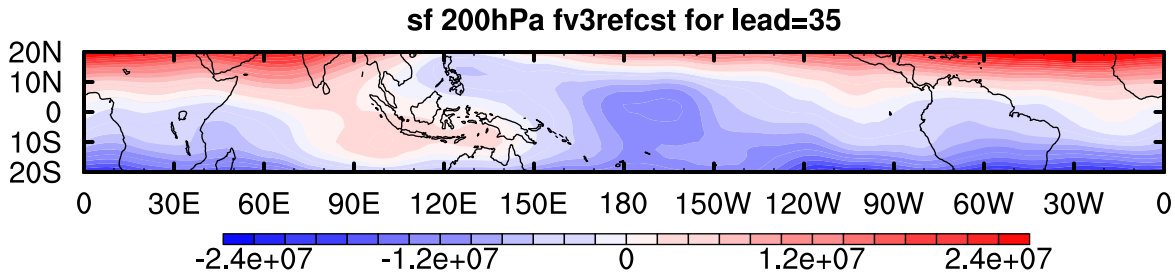
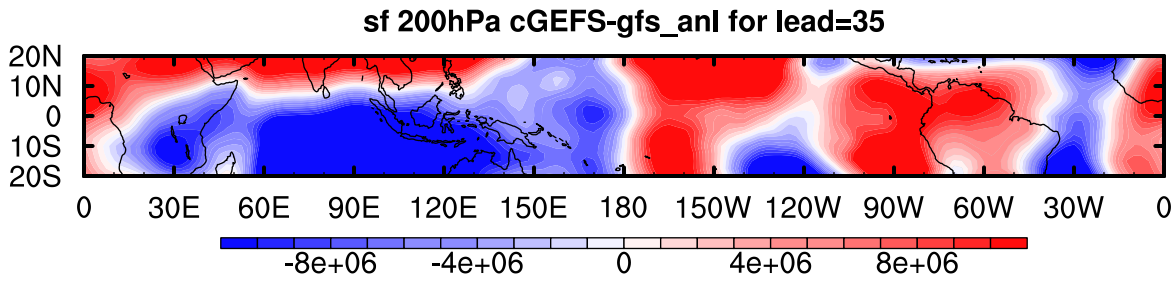
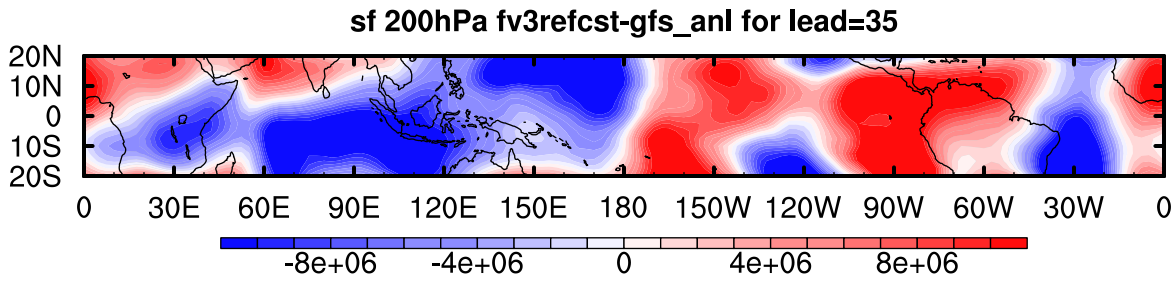
-4e+06
0
4e+06
8e+06

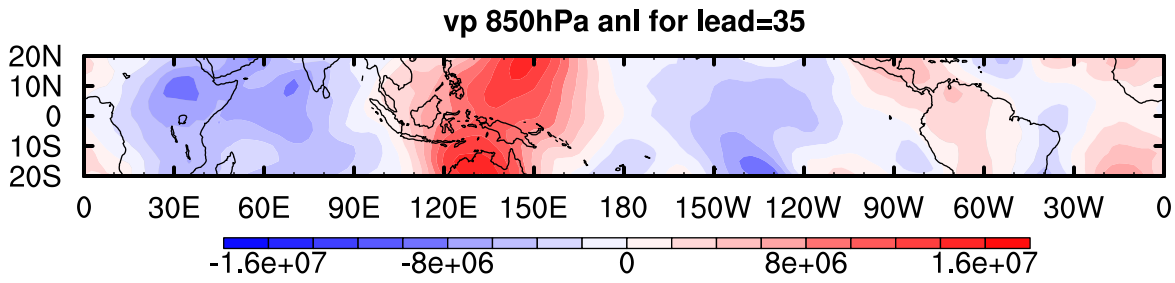

sf 200hPa anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

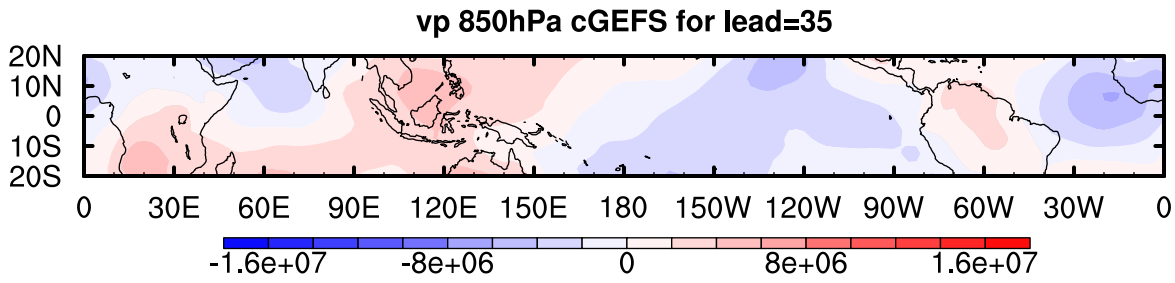

sf 200hPa cGEFS for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

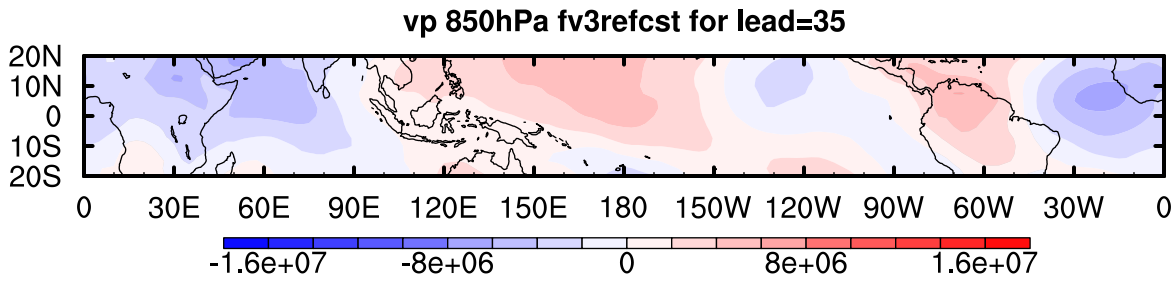

sf 200hPa fv3refcst for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

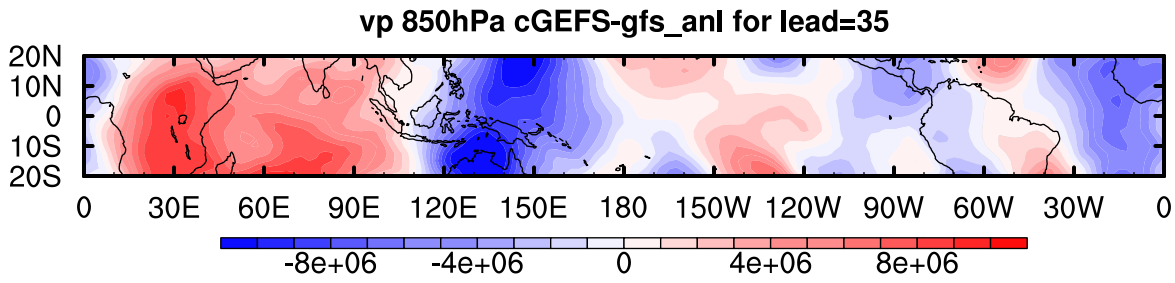

sf 200hPa cGEFS-gfs_anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

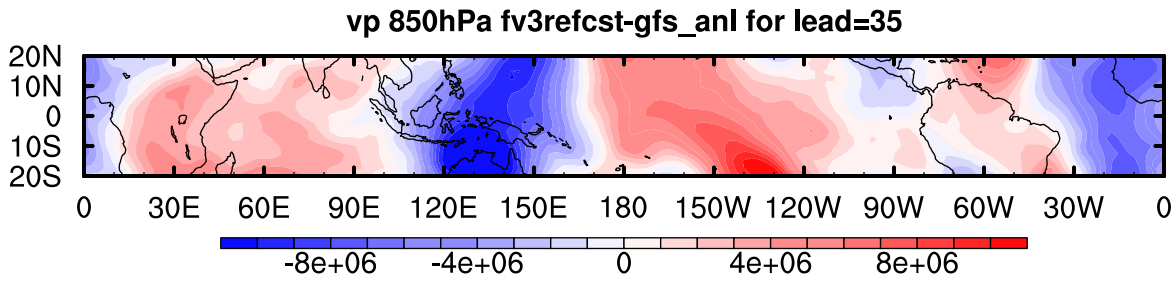

sf 200hPa fv3refcst-gfs_anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

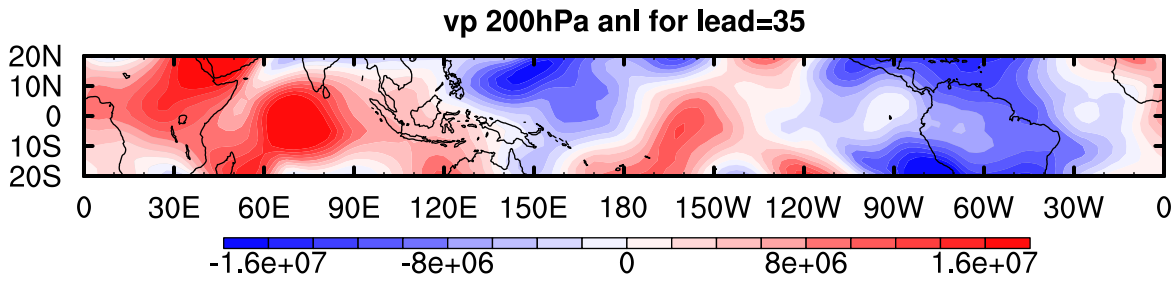

vp 850hPa anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa fv3refcst for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07


vp 850hPa cGEFS-gfs_anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 850hPa fv3refcst-gfs_anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06


vp 200hPa anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
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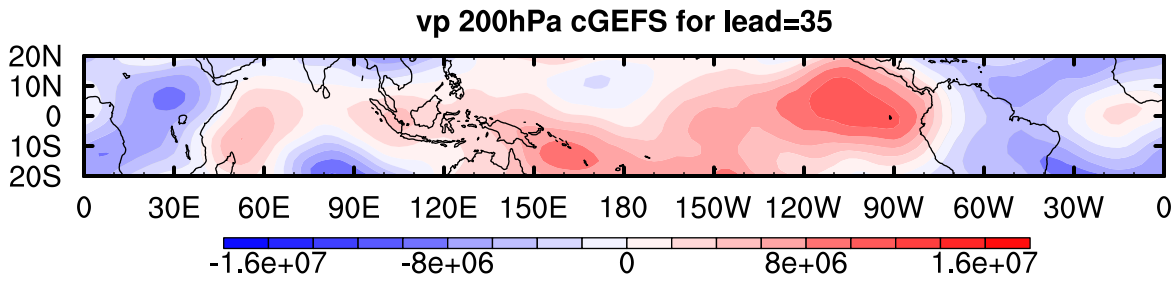
1.6e+07


vp 200hPa cGEFS for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
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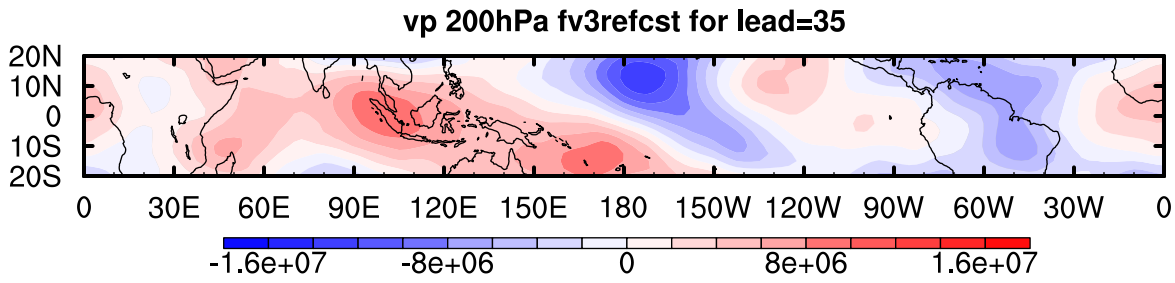
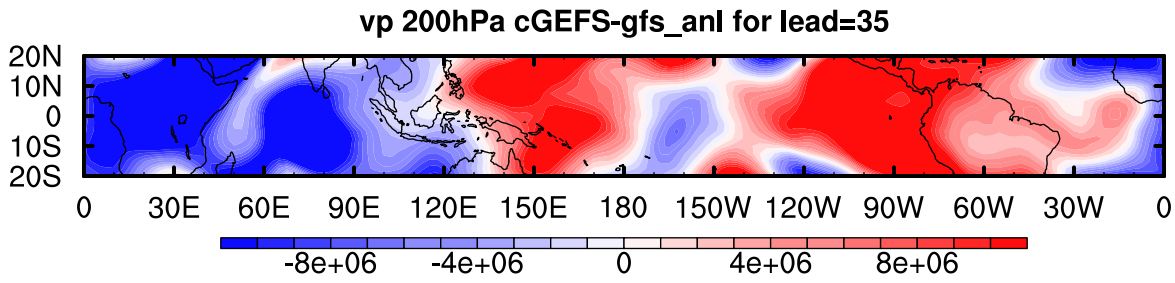
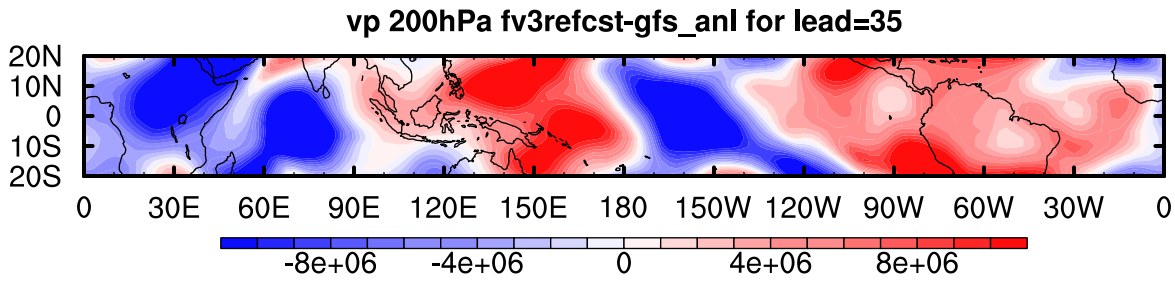
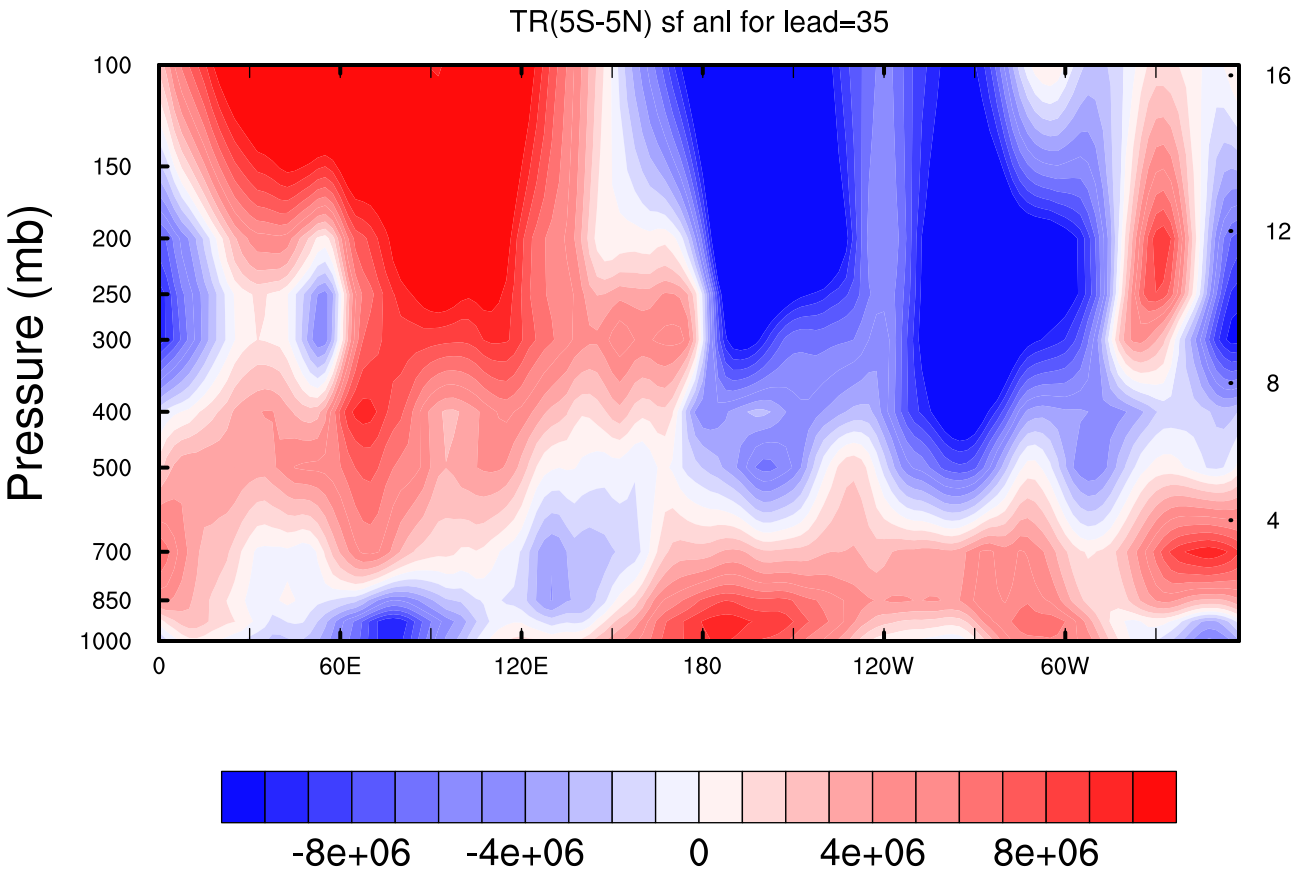
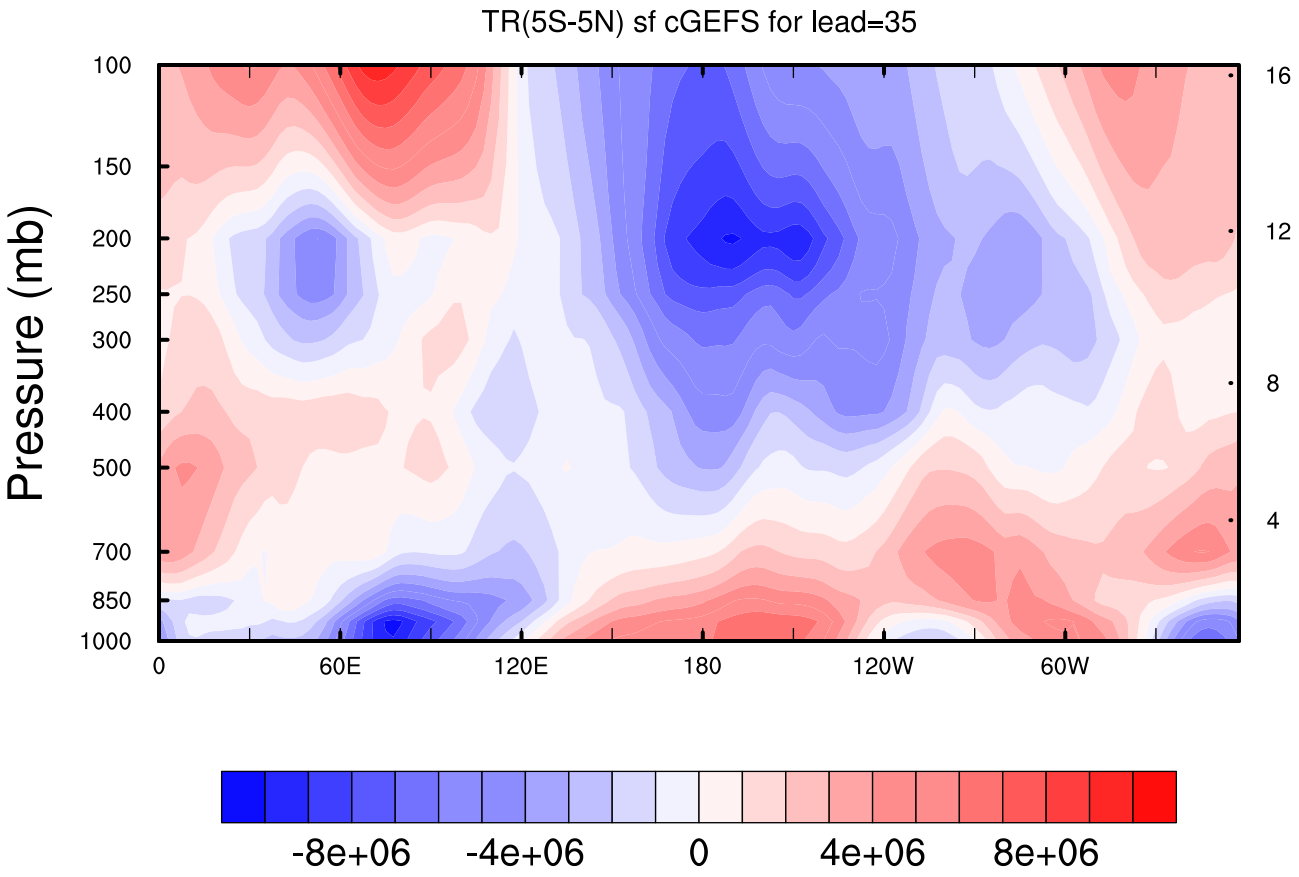
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

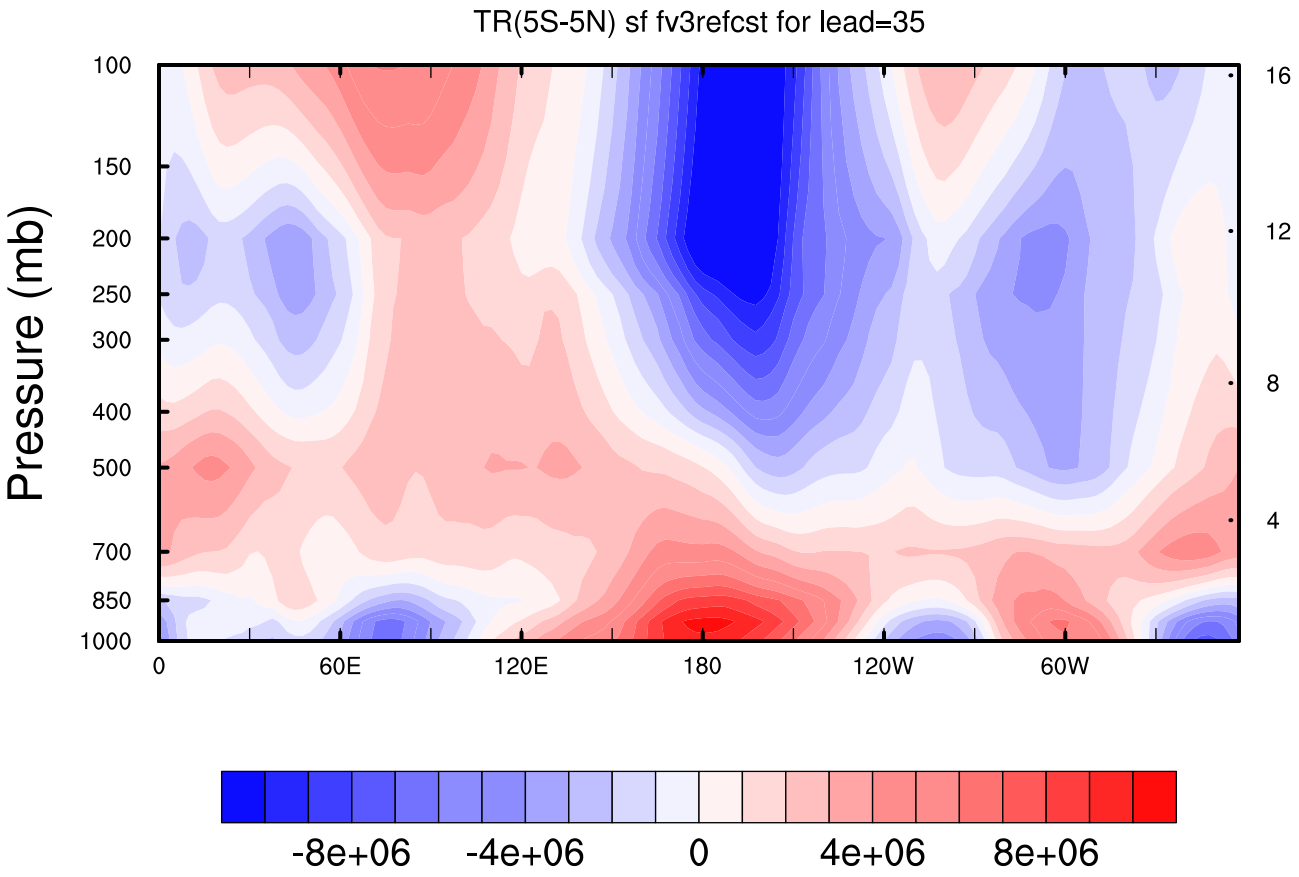

vp 200hPa fv3refcst for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-1.6e+07
-8e+06
0
8e+06
1.6e+07

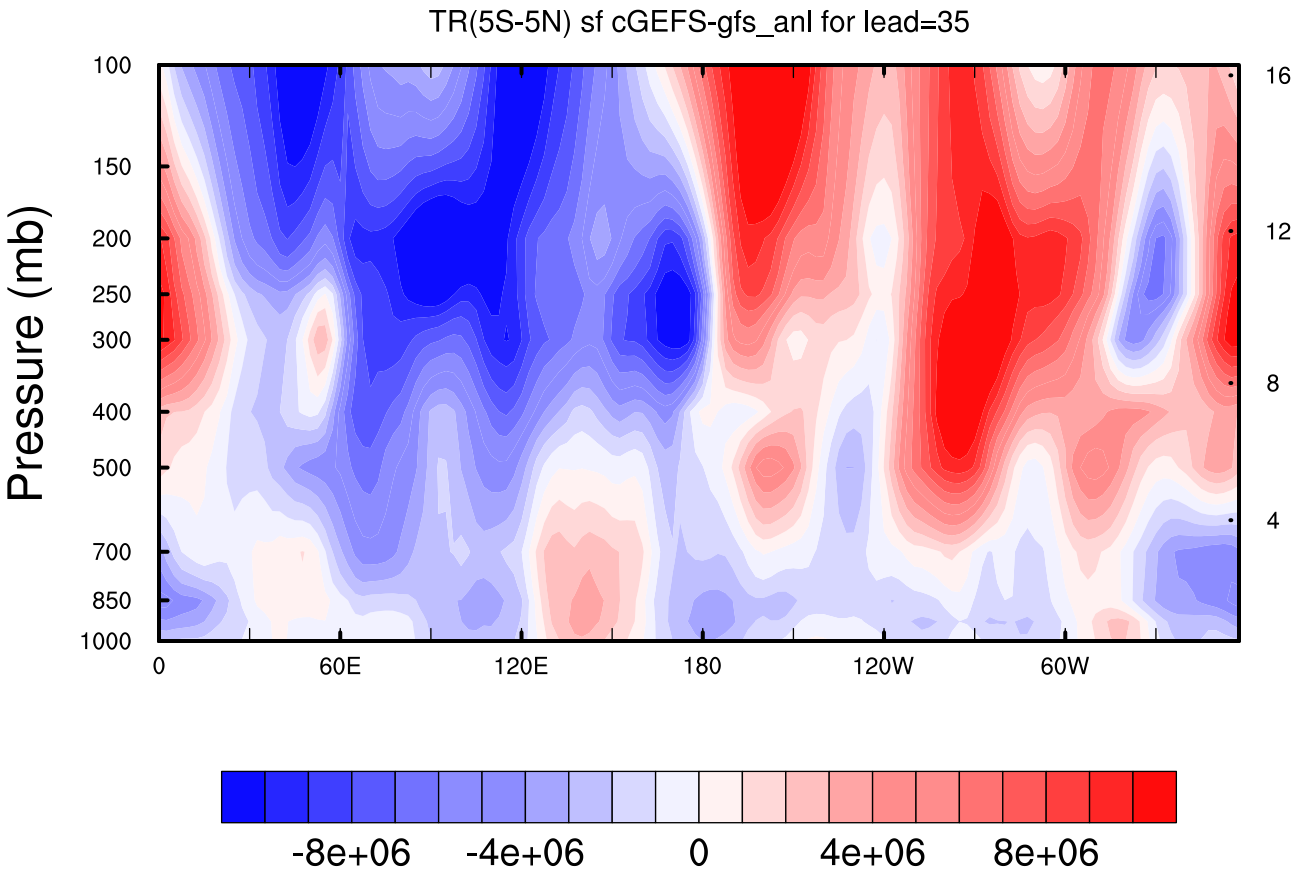

vp 200hPa cGEFS-gfs_anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

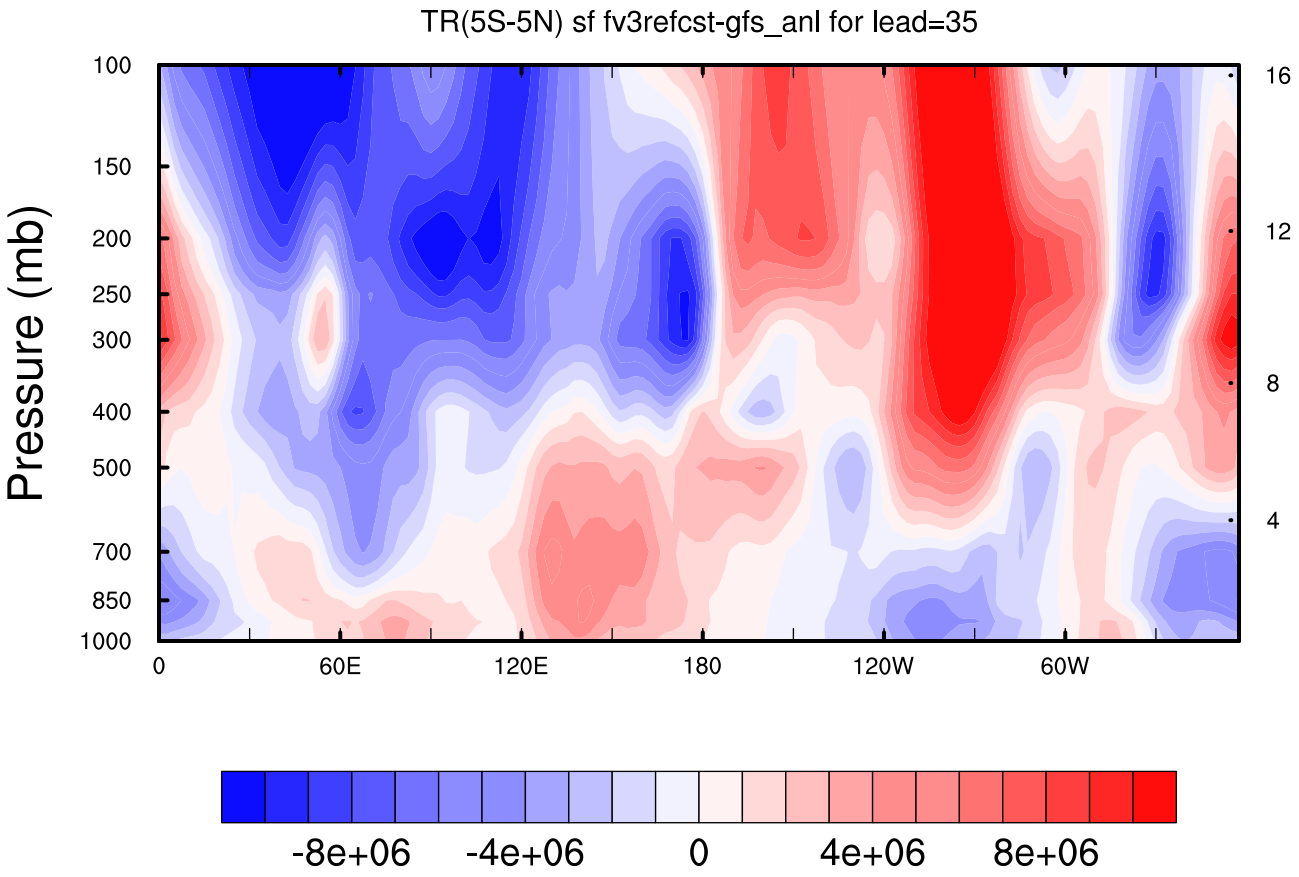

vp 200hPa fv3refcst-gfs_anl for lead=35
20N
10N
0
10S
20S
0
30E
60E
90E
120E
150E
180
150W
120W
90W
60W
30W
0
-8e+06
-4e+06
0
4e+06
8e+06

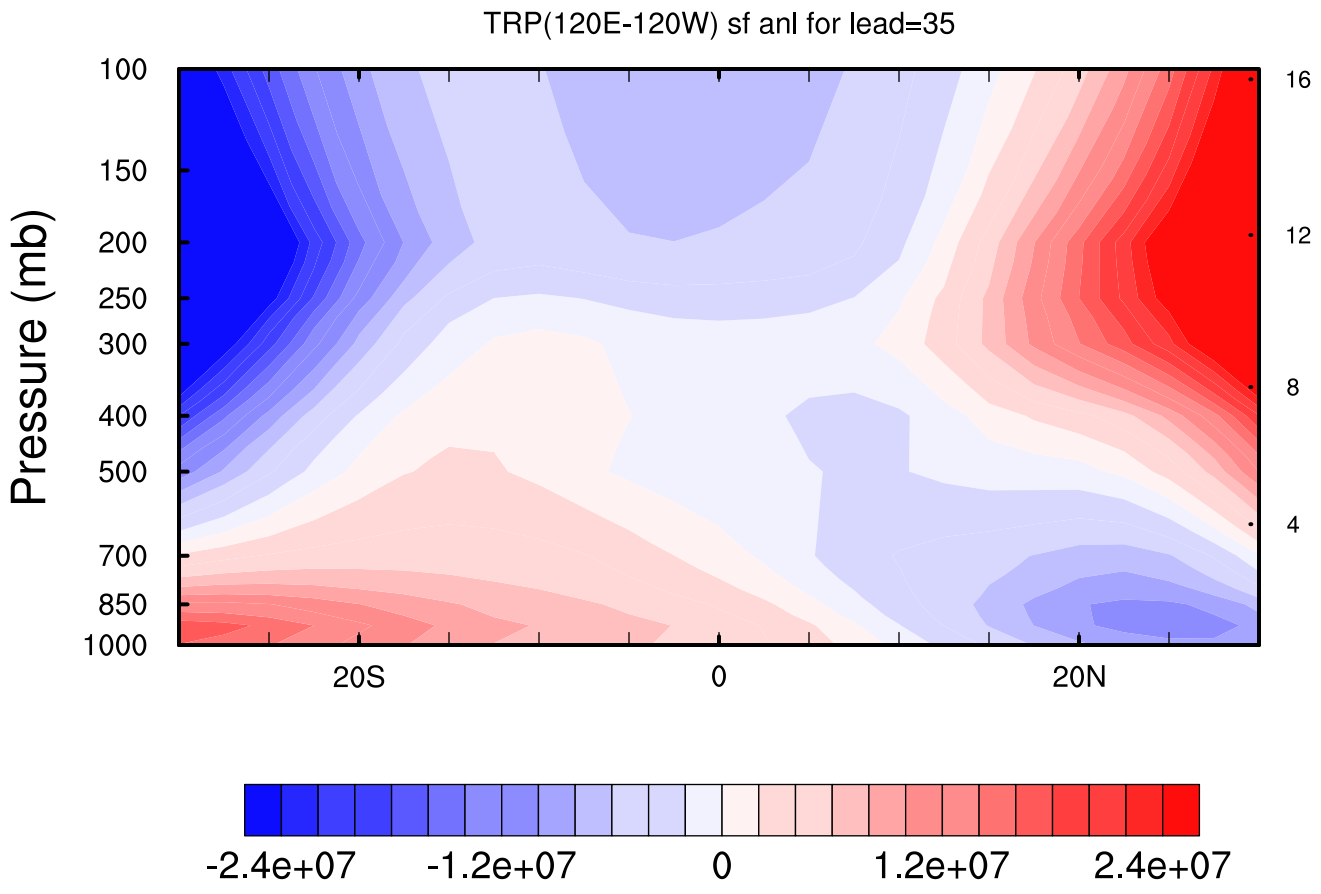

TR(5S-5N) sf anl for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

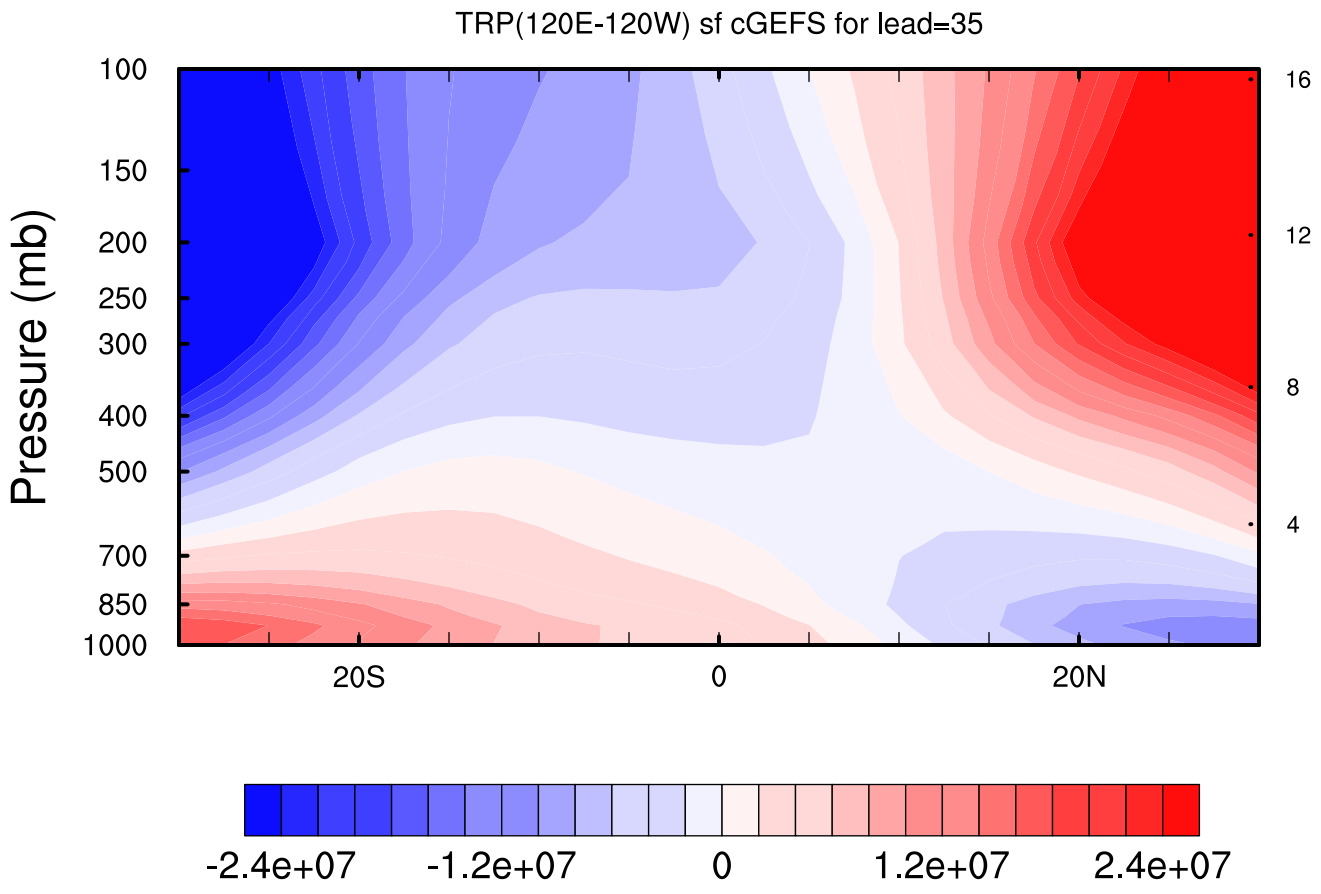

TR(5S-5N) sf cGEFS for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

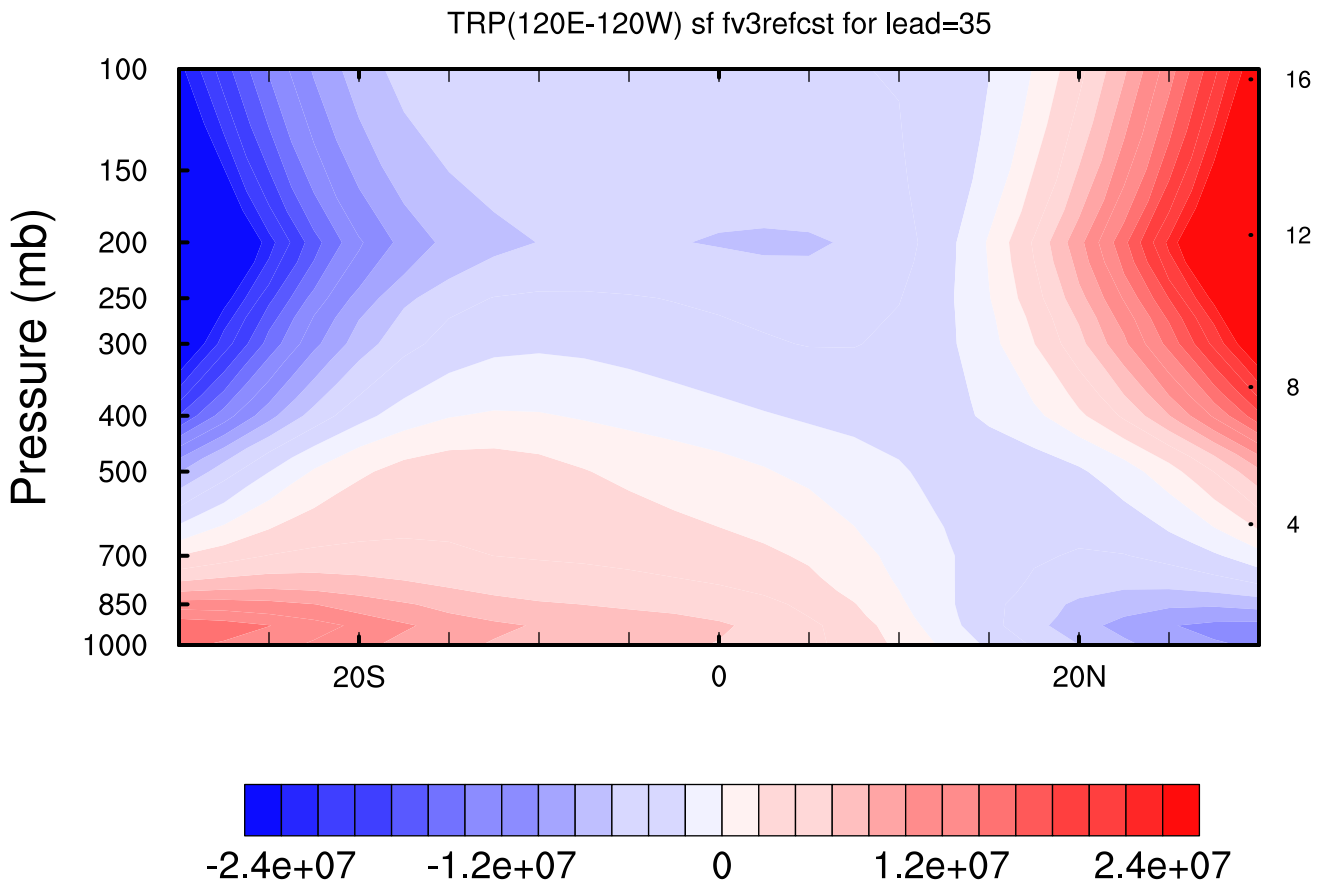

TR(5S-5N) sf fv3refcst for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

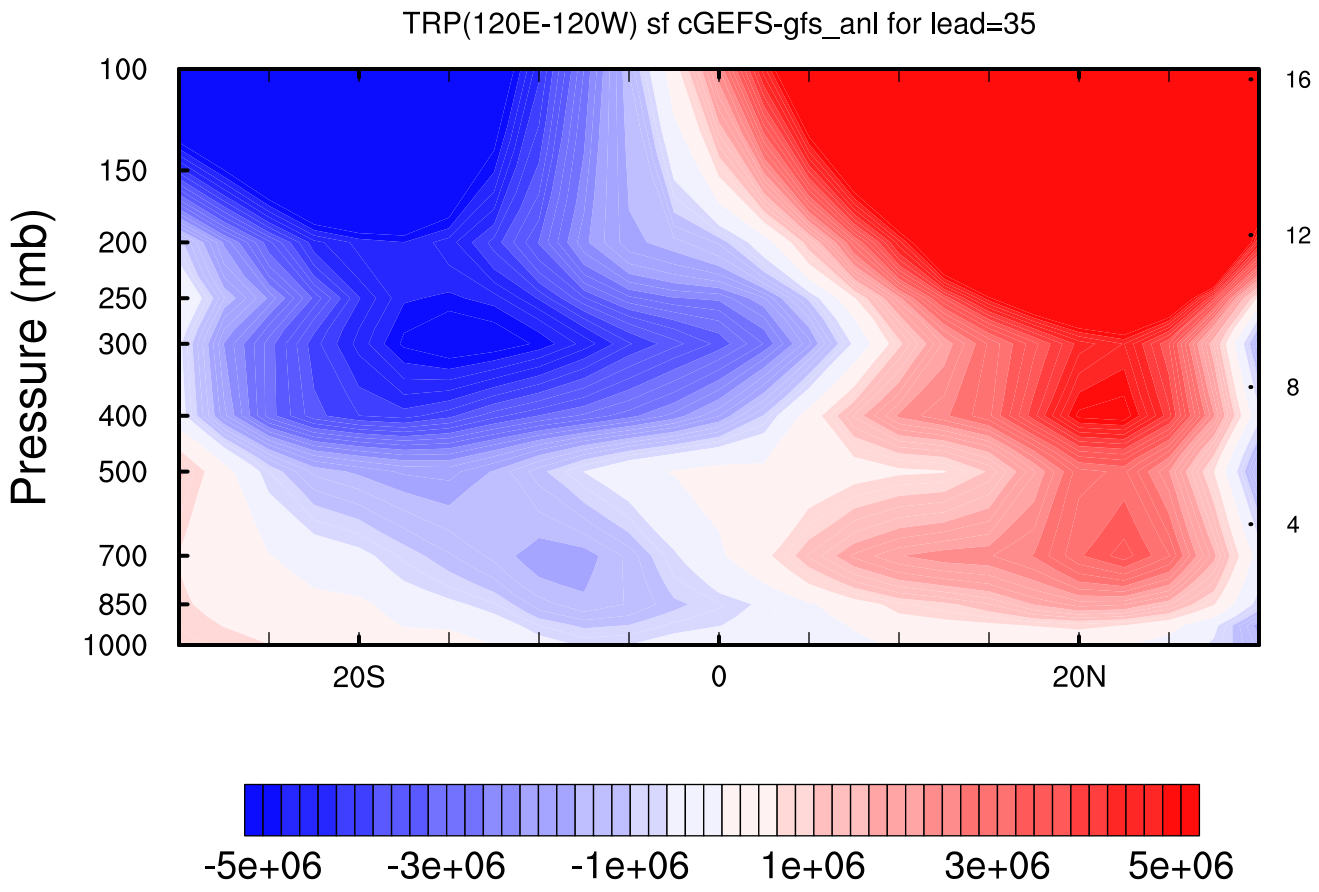

TR(5S-5N) sf cGEFS-gfs_anl for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

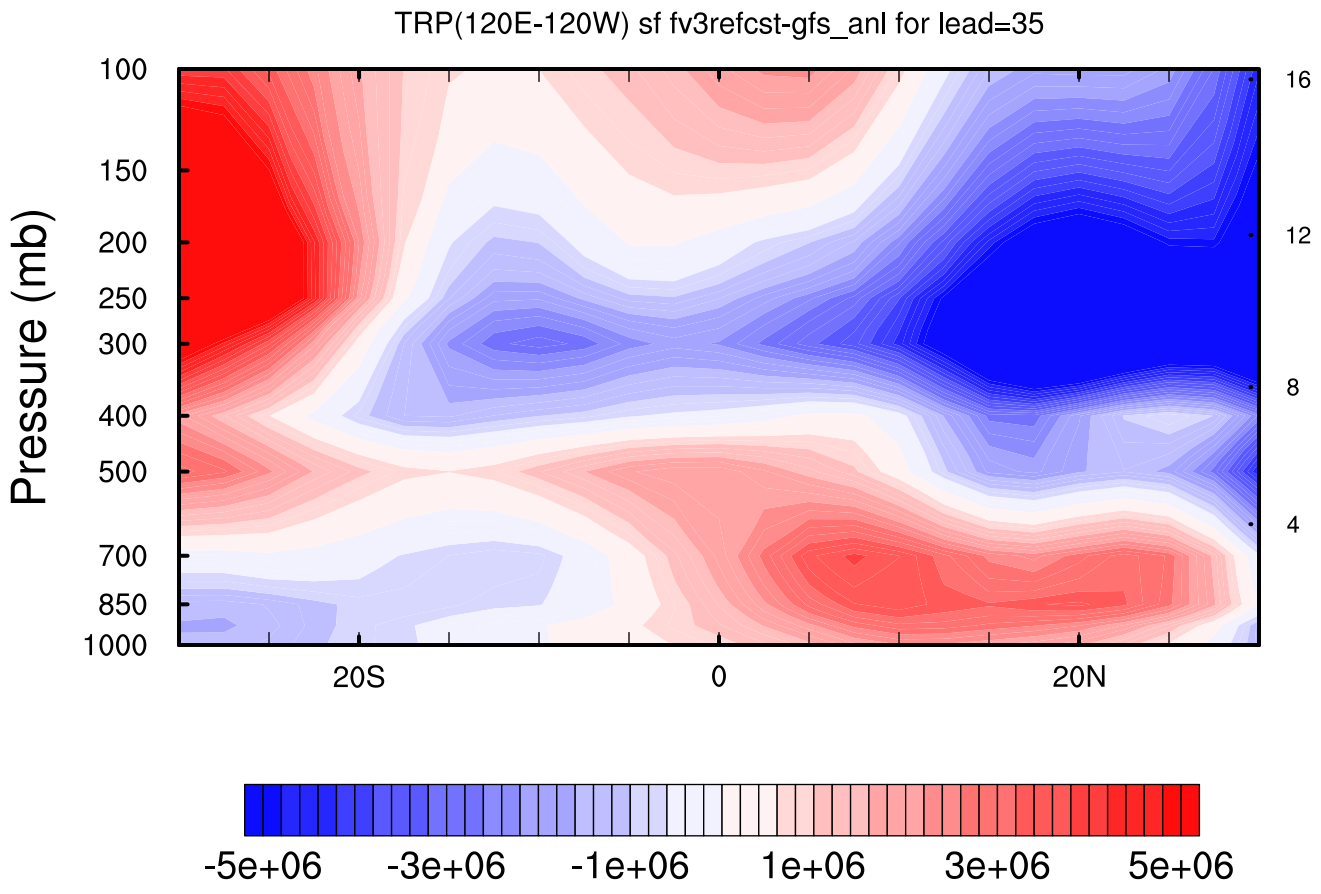

TR(5S-5N) sf fv3refcst-gfs_anl for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

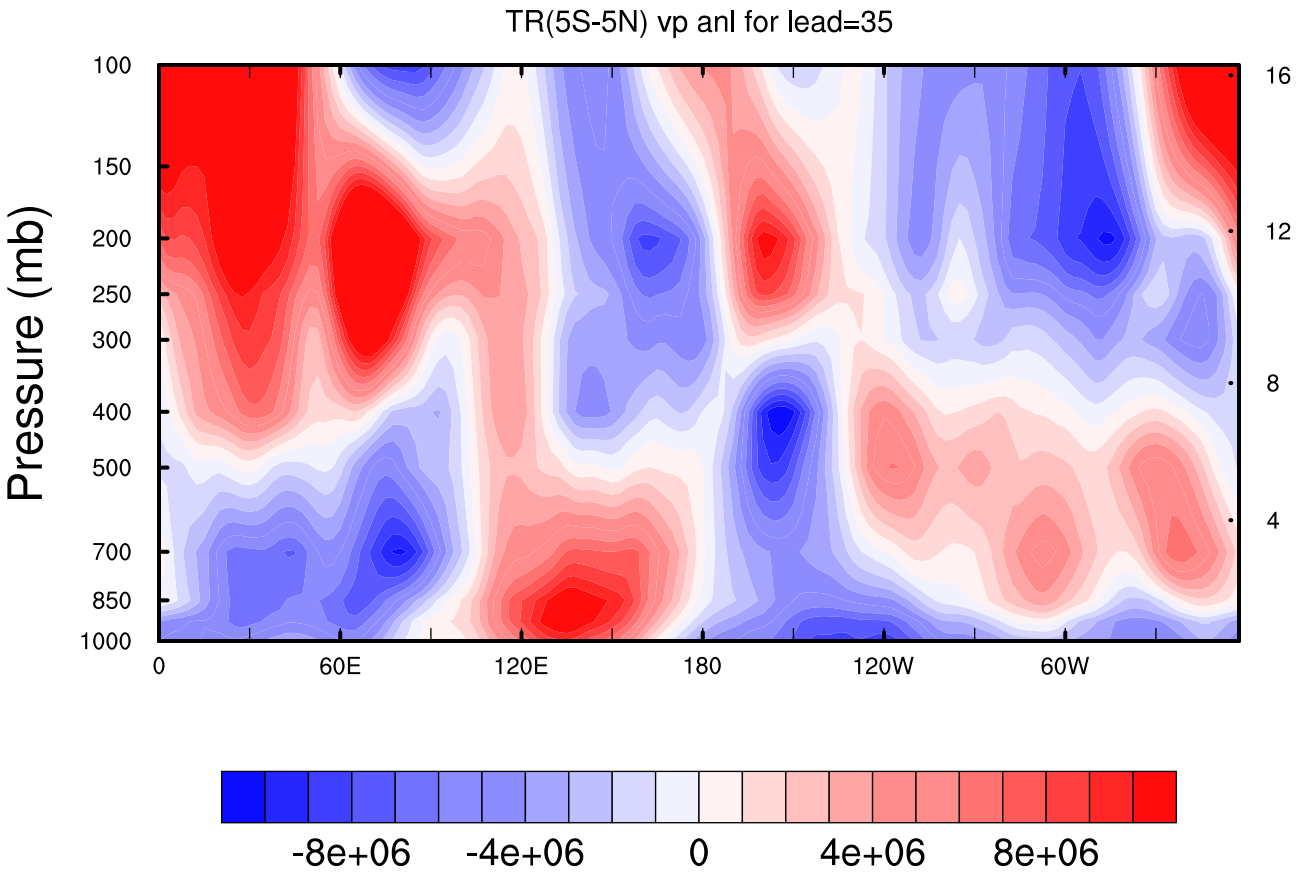

TRP(120E-120W) sf anl for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

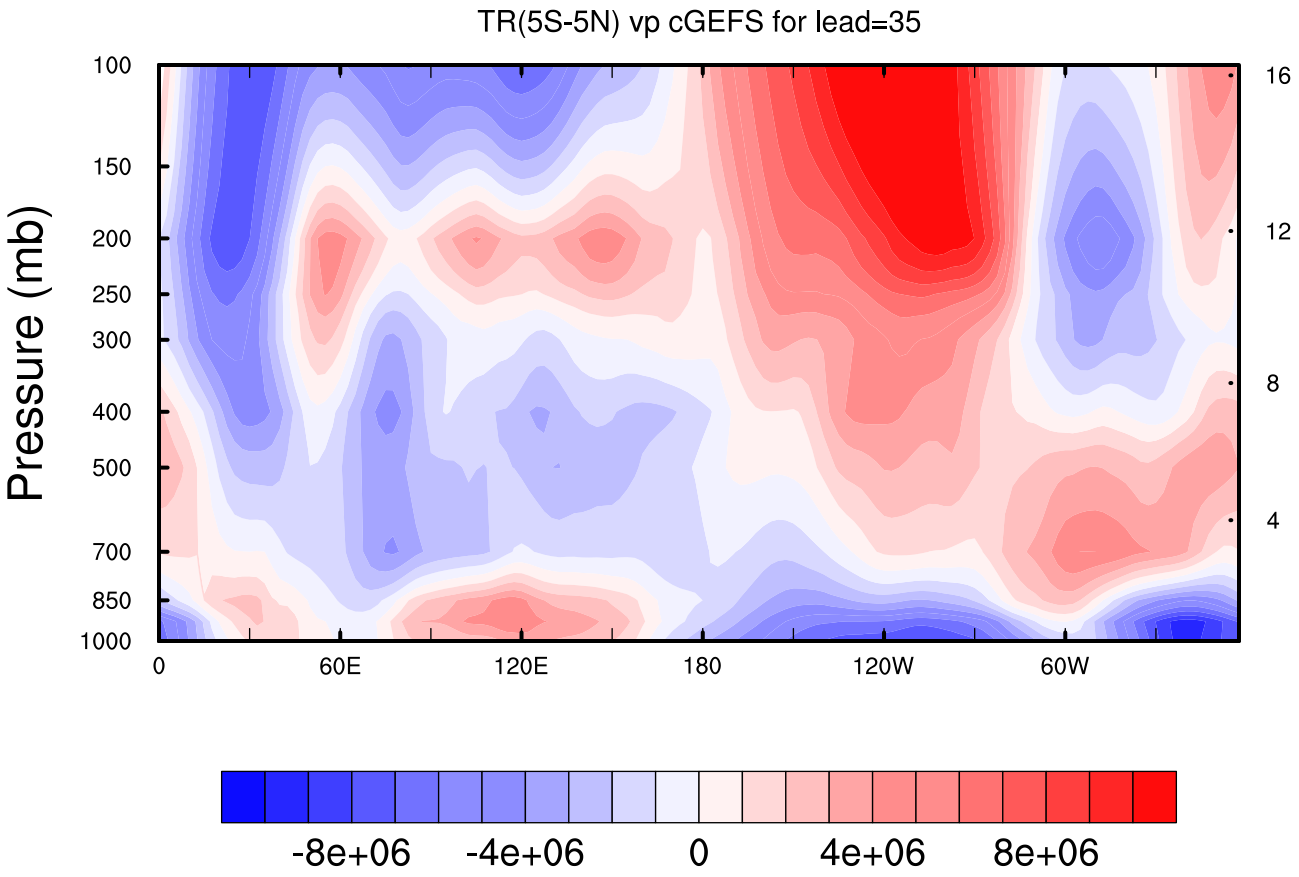

TRP(120E-120W) sf cGEFS for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

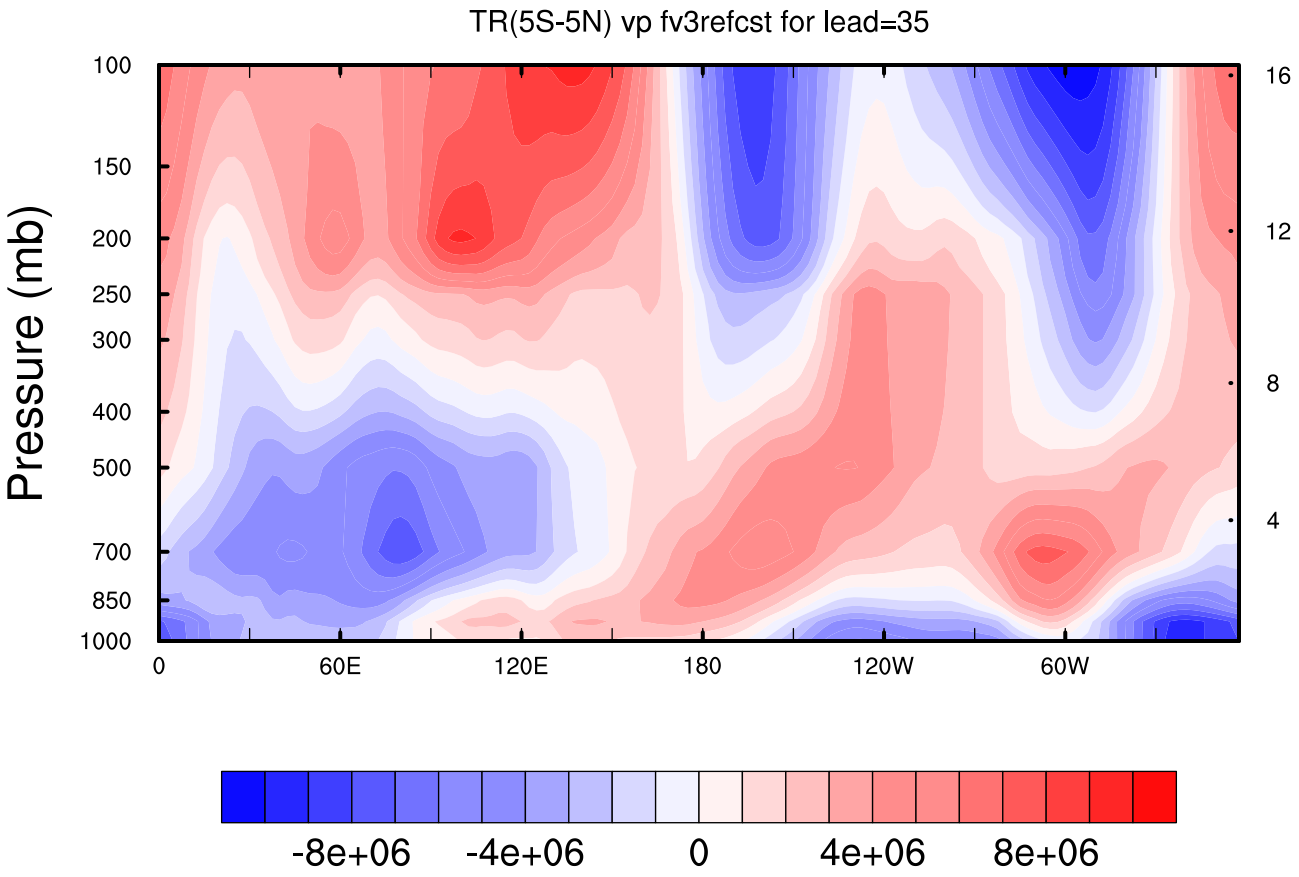

TRP(120E-120W) sf fv3refcst for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-2.4e+07
-1.2e+07
0
1.2e+07
2.4e+07

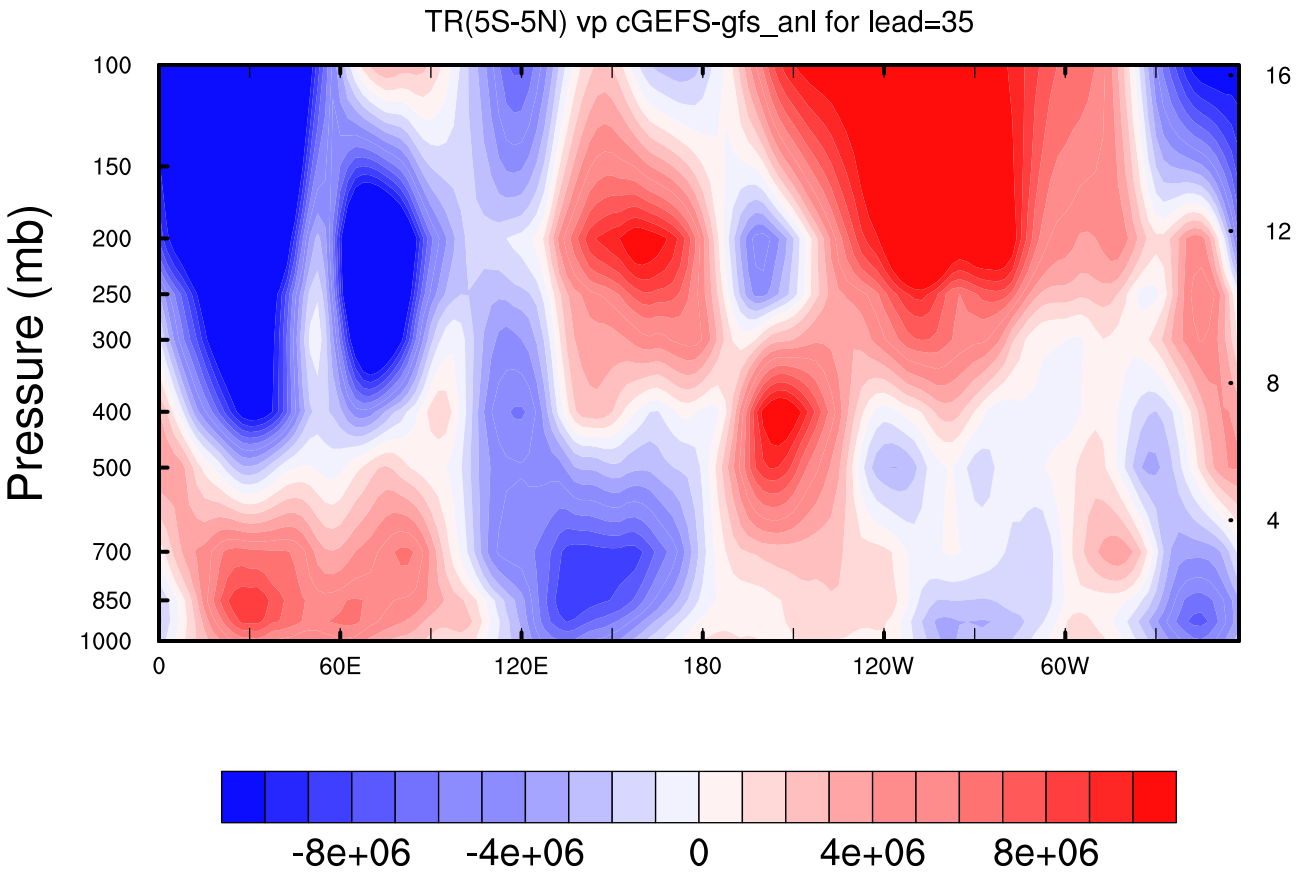

TRP(120E-120W) sf cGEFS-gfs_anl for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

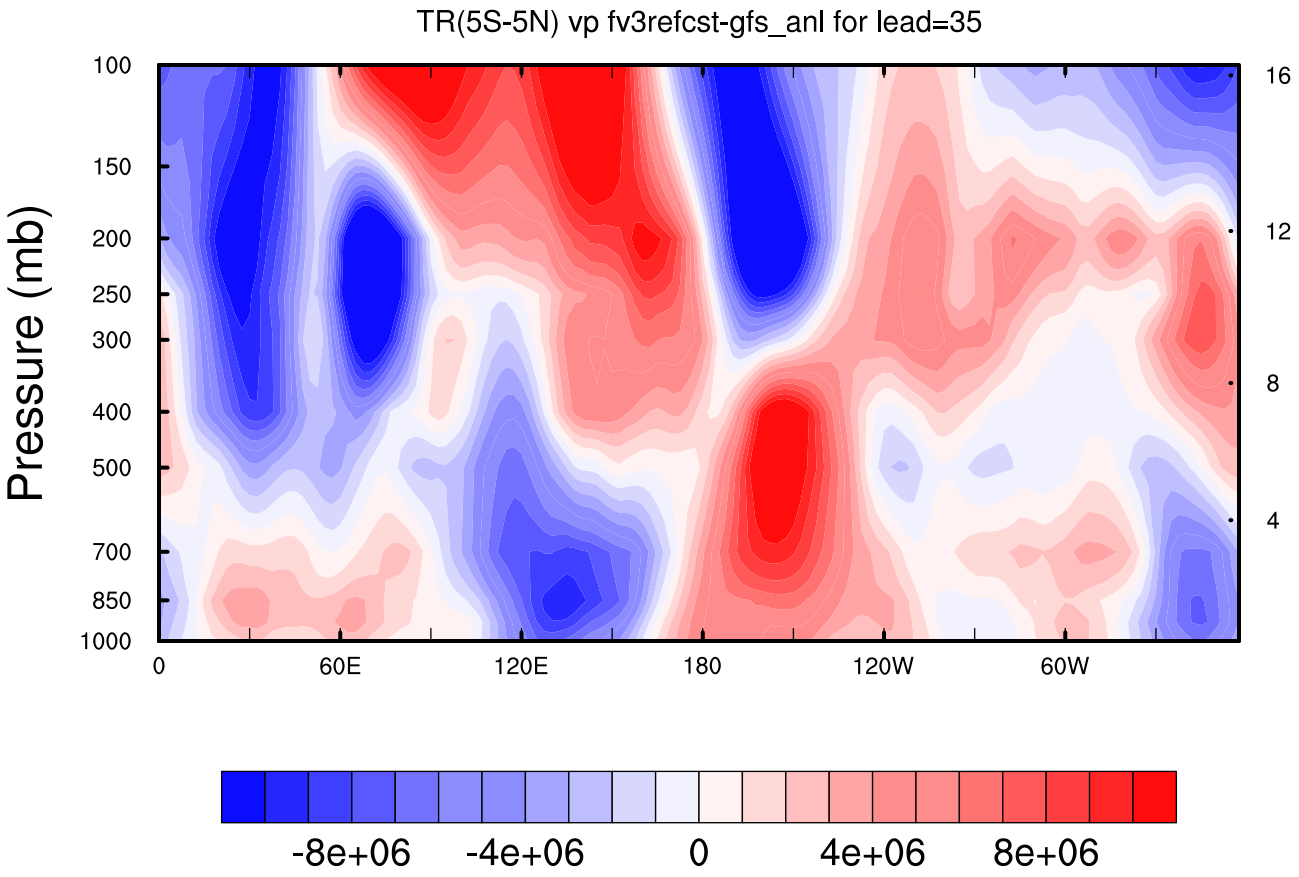

TRP(120E-120W) sf fv3refcst-gfs_anl for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
20S
0
20N
16
12
8
4
-5e+06
-3e+06
-1e+06
1e+06
3e+06
5e+06

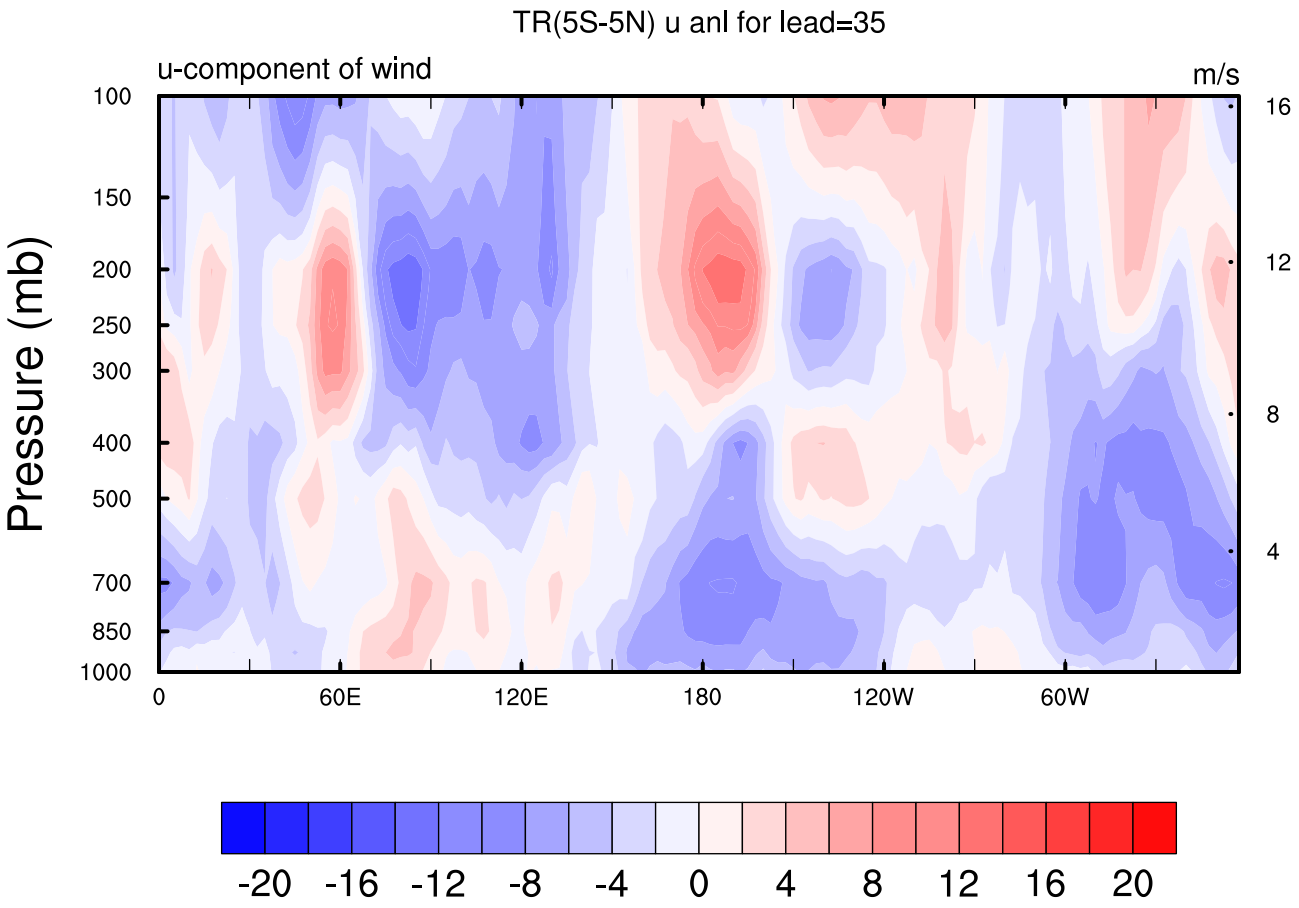

TR(5S-5N) vp anl for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

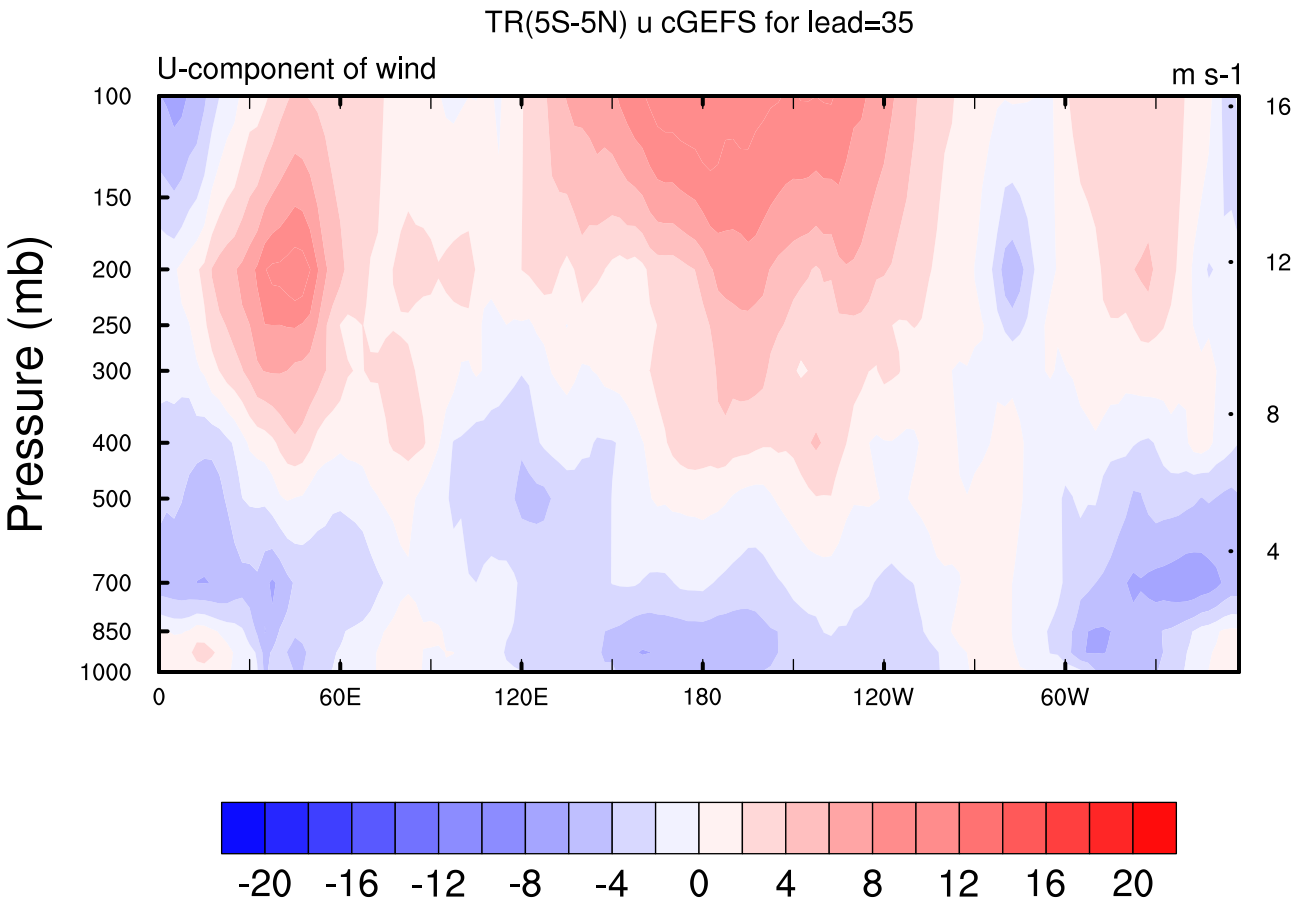

TR(5S-5N) vp cGEFS for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

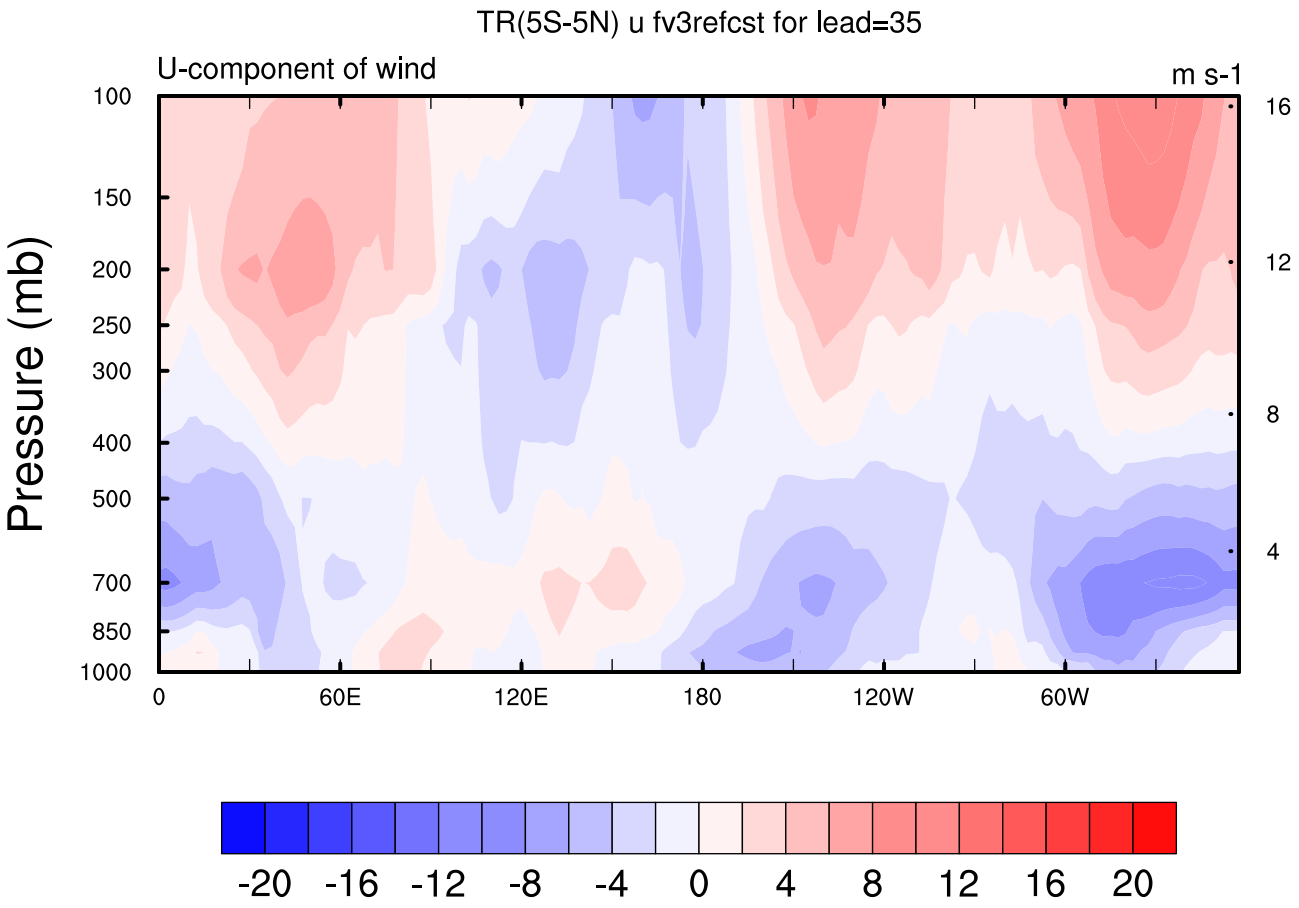

TR(5S-5N) vp fv3refcst for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

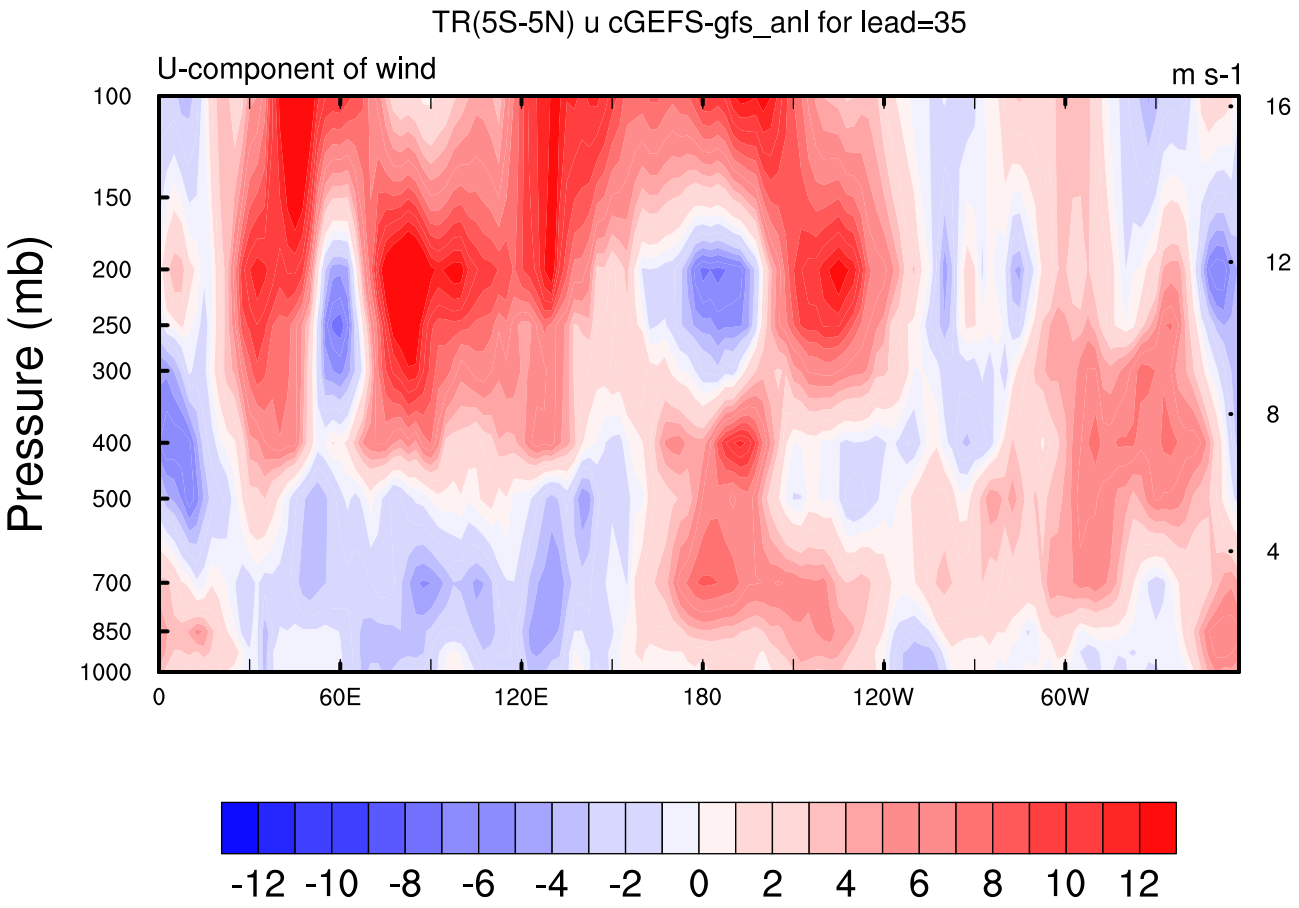

TR(5S-5N) vp cGEFS-gfs_anl for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06

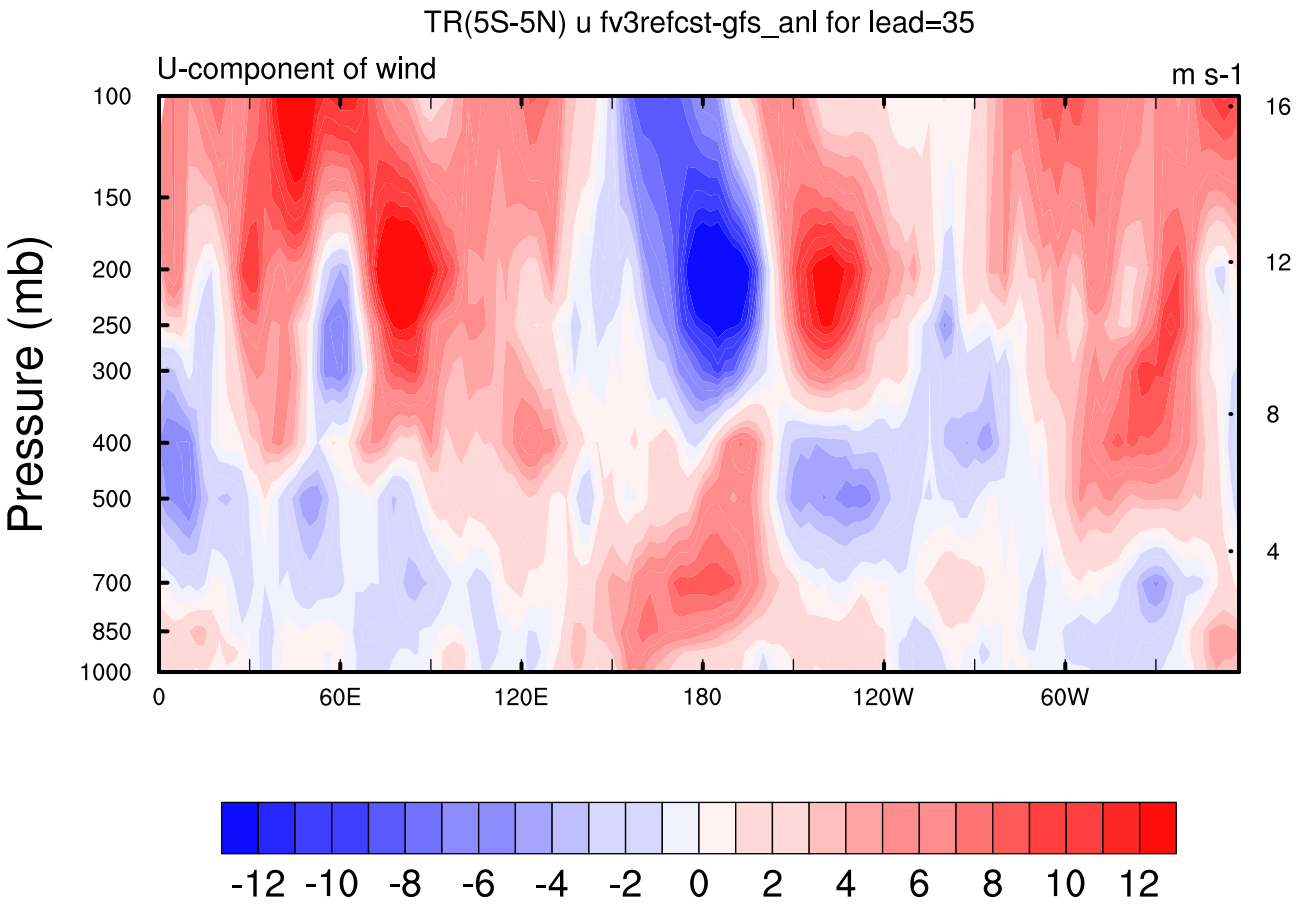

TR(5S-5N) vp fv3refcst-gfs_anl for lead=35
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-8e+06
-4e+06
0
4e+06
8e+06


TR(5S-5N) u anl for lead=35
u-component of wind
m/s
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS for lead=35
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u fv3refcst for lead=35
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-20
-16
-12
-8
-4
0
4
8
12
16
20


TR(5S-5N) u cGEFS-gfs_anl for lead=35
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12


TR(5S-5N) u fv3refcst-gfs_anl for lead=35
U-component of wind
m s-1
Pressure (mb)
100
150
200
250
300
400
500
700
850
1000
0
60E
120E
180
120W
60W
16
12
8
4
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
12