## Review comments on the revised version of "Characteristics over the Taklimakan Desert: A Real Test Case" (ACTA-E-2018-0001.R1)"

Many changes were made through the authors' efforts in the revised manuscript. However, the grammar errors continue to occur almost everywhere in this updated version. A heavy English edit work is required to improve the writing. It is strongly recommended to seek a professional language edit service. As pointed out in the first turn review, it is not useful to present the impact of the ingest frequency of the lateral boundary conditions on the large-eddy simulation (LES) results if the WRF/LES has a capability of running the online-coupling mode. In addition, the simulated sensible and latent heat fluxes presented in Figures 4 and 10 are not accepted for publication without further improvement. As pointed by the authors, the observed sensible heat flux could be too low on July 1, 2016. What about the observational data for other days? Did the authors see the similar low observed sensible heat fluxes on other days since you have one-month data in July 2017? Over-predicted latent heat flux in the first several simulation hours should be alleviated by setting the initial soil moisture in the simulations as the observed value. Did the authors try that? It is noted that the great efforts were made to improve the manuscript. However, another major revision is needed before it is accepted for publication.

More specific comments are found below.

- 1) The LES results presented in Figures 4 and 10 need further improvements. It is suggested to use the observed soil moisture as the initial condition for the new LES runs.
- 2) Lines 398-399, the authors pointed out that the sensible heat (SH) may not be the dominant factor for the development of the deep CBL over the Taklimakan desert. However, in the conclusion part (line 461), the authors highlight that the SH is an important factor affecting the CBL depth over dominant. Please have double check and make them to be consistent? It should be very careful to make the former statement. If this were the case, that would be a big finding from this study?
- 3) L136: The setting of vertical levels of the WRF/LES simulations is not correct. It is impossible that the vertical level starts from 1130.473m.
- 4) Please make sure all the abbreviated terms are defined at the place where they appear at the first time. Please define GPS at Line 45, and check the same issue throughout the manuscript.
- 5) Line 48: Change "relative warmer" to "relatively warmer".

- 6) Lines 50-51, change "Lateral Boundary Layer(LBC)" to "lateral boundary layer (LBC)". Please add one space before "(". There are many similar errors in other places of the manuscript.
- 7) Please be careful to use the upper case for the first letter of a word. Here "Lateral Boundary Layer" is one example (L50-51). More similar problems include "china" (L73), "Vertical" (L288), "Large-scale" (L300), "Specified LBC" (L319), etc. I am not going to list all of them here. It is the authors' responsibility to correct all the problems.
- Please pay more attention to the usage of past tense and singularity of verbs. Some examples include "model show…" (L206), "but model produce" (L223-224), "… temperature are …" (L245), "Figure 5 compare" (L327), etc. There are too many errors like this. The authors should be able to correct and avoid them.
- 9) Lines 52-54. Please rewrite the sentence starting with "It is found ....". It is difficult to understand the authors' meaning.
- 10) Please change "locates" to "located".
- 11) Line 70: Please add year after Wang et al.
- 12) Line 81, please rewrite the sentence "This fundamentally restrict the development of understanding desert and surrounding area".
- 13) Line 86, "To fill in the gaps of Taklimakan desert" is ugly.
- 14) Line 97, "PBL can heavily impacted"?
- 15) Line 98, "One way to tackle complex turbulent flows in weather forecast models is Large eddy simulation (LES)....." needs an improvement. Please correct. Again, there is no need to redefine LES if it is defined previously.
- 16) Line 112, what is the LBCS?
- Line 118, For the statement of "this paper is to examine assess the skillfulness....", please delete examine or assess.

- 18) Lines 136-138, what is the unit of the height?
- 19) Line 140, please change the sentence "The sizes of model grids are 411 ×321 791x651 211x201 and 403x406 respectively." to "The numbers of model grids from the outmost to the innermost domains are 411 × 321, 791 × 651, 211 × 201, and 403 × 406, respectively". Several similar issues can be found in other places such as Lines 139, 207-208, etc. Please pay more attention on how to use ",".
- 20) Lines 258-260, how can you attribute the reason to the potential temperature lapse rate?
- 21) Line 266, please define CBLH. Please check out throughout the manuscript.
- 22) Line 301, "may resulted in"  $\Rightarrow$  "may result in".
- 23) Line 318, for "LES simulation", please delete "simulation" since LES has included.
- 24) Lines 330-331, for the sentence "However, the comparison results reveal that discrepancies among different experiments are large for CBL"? What does the "discrepancy" represent?
- 25) Using "The" or "the" correctly is a big challenge. It seems that the authors have a big trouble of using "the" or "The". For example, on Lines 331, "CBL" should be "the CBL". There are too many issues like this.
- 26) Line 350, the sentence "CBL, the instantaneous vertical velocity fields for the horizontal are displayed in" is incomplete. Please correct.
- 27) L353-357, figure number is missing.
- 28) Line 374: import or important?
- 29) Line 375, "surface-land schemes" should be "land-surface schemes".

- 30) Line 376: "the difference between model and observation" should be "the difference between simulations and observations". Similar issues can be found other places too.
- 31) Lines 382-384, please rewrite the sentence "The results ... 125%".
- 32) Line 414, what do the large LES experiments mean?
- 33) Lines 446-447, please rewrite the sentence "Overestimation of CBL profile may be caused by discrepancy between model and measurement initially".
- 34) Lines 527-528: (d) "surface temperature (°C)" is not matched with Figure 4.d.
- 35) Line 534, please add "," between (a), (b), (c), and (c).
- 36) Line 535, change "01 Jul2016" to "01 July 2016". Check the same issues in other places too.
- 37) Figure 7, please add labels to x-axis and y-axis for all the four panels.
- 38) I have to say that it is difficult to list all of the writing errors here since there are too many.