

Comments on “A long-term wind speed ensemble forecasting system with weather adapted correction”.

General comments:

Accurate numerical forecast of wind speed is critical to wind power generation. In this manuscript, the authors presented a study on improvement of wind speed forecast with ensemble and bias correction skills, and demonstrated substantial improvement of wind speed forecast with these skills over the coastal regions of East China. They developed a wind ensemble forecasting system based on the Weather Research & Forecasting (WRF) model, and refined the average bias correction by introducing a parameter named Weather Type. They found that the correlation between ensemble forecast biases and weather types is much higher than between single forecast bias and weather types. The results indicate that the ensemble forecasts with weather adapted bias correction have the best performance on wind speed forecast. The study provides a very useful and feasible way to improve wind speed forecast and the topic represents a great practice interest in wind power industry. Overall, the manuscript is clearly presented. However, some additional information and in-depth analysis are needed to better understand how this ensemble forecasting system with bias correction can improve the wind speed forecasts. The manuscript is recommended for publication by Energies with necessary revision.

Specific comments:

1. More detailed descriptions about weather adapted bias correction are needed since it is the key to improve ensemble wind speed forecast in this study. Especially, it is not well illustrated how the statistical correlation between forecast errors and weather types is used to correct the original numerical forecast.
2. It will be helpful to add a table to summarize the major features of the 18 weather types and the performance of the forecasting system on wind speed forecast for each weather type.
3. P4/L144-175: I am not sure that Section 3.1 is placed in the right place or not since it is not closely with section of statistical correction.
4. P1/L18: Change “The forecast system” to “The forecasting system” for the consistency with other places.
5. P2/L77-79: Delete since they do not provide any additional information.

6. P2, Section 2.1: More details about model configuration are needed.
7. Why does the forecasting system only output predictions for the period of 28-52h? How many hour simulations were conducted for each day?
8. P2/L81-82: Delete “been well known and”.
9. P3/L93: Change to “... used the NCEP Global Forecasting System data as ...”.
10. P3/L101-105: Define the full names of MM5, RUC, and MYJ. Make sure that an abbreviated term is defined when it appears at the first time. Please check this carefully throughout the manuscript.
11. P3-4/L119-122: The correlation between forecast biases and weather types created from the training period (i.e., Sept. 2013 to Aug. 2014) can be directly used to correct the raw ensemble forecast. Why did the authors use the NCEP reanalysis data to identify the weather types from another period (2005-2012)? How can they be linked together? Please address this question with the comment 1 together.
12. P4/L114-118: It is unconvincing to link the flat terrain in coastal regions with the statements provided here.
13. P4/L125: change “LST 08:00 am” to “08:00 am LST” and change “UTC 1200” to “1200 UTC”. Please define LST and UTC.
14. P5/L205: “in the figures above” should be “in Figure 2”?
15. P6, Figure 2: It is difficult to distinguish the prediction error distributions among the 18 weather types in Figure 2. It will be helpful if the authors can add one more table to summarize their mean features as illustrated in Figure 2.
16. P6/L210: change “in each of six wind farms” to “at the six wind farms”.
17. P6 and P11/L351-354: Why do ensemble-forecast errors have higher correlation with weather types than the single forecast error? Some additional explanations are necessary.
18. Figure 2: Not discussed in text.

19. P8/Tables 3-5: Which one represents change rate (%)?
20. P9/L285-287: Some explanations are needed to address that the average bias correction made a substantial improvement to mean bias but not for *sbias* and *disp*.
21. P9/L192: Define MAE.
22. P9/L300-301: Please explain each symbol in Eqs. (12) and (13).
23. Discussion of Figure 5 should be completed in Section 4 rather than in Section 5.
24. P12/Figure 5: The label "1010" in x-axis represents "Oct 10"?
25. Table A1: Please spell out all the abbreviated terms.