Response to reviewer comments

Dear Editor and Reviewers,

We are very grateful for your time and valuable comments, which we found very helpful. We have addressed questions and comments raised by the reviewer in the revised manuscript with tracked changes. Please find our point-by-point response (in blue font) to the comments below. We hope our revisions have properly addressed your concerns.

Thanks again for your time.

Sincerely, The authors

Reviewer 1

The revised version of the Zhou et al. manuscript addresses my concerns and I recommend it for publication.

Response: Thank you very much for your recognition and encouragement of our work, we have taken your comments into consideration and further edited our manuscript.

Specific comments:

1. My only suggestion is that instead of noting Time as UTC+08:00 in the figure legends, the figure axes "Hour" could be changed to "Local time (UTC+8)" or something similar which makes the figures more readable.

Response: Thank you very much for pointing this out.

We have changed the "Hour" of the figure axes to "Local time (UTC+8)" in the Figs. 6, 7, and 9.

The same changes have been corrected in the supplementary material.



Figure 6. The scatter density map compared with the actual 10-meter wind speed: (a) 10-fold cross-validation training set of VMD-PCA-RF model in February 2022, (b) 10-fold cross-validation validation set of VMD-PCA-RF model in February 2022. The 24-hour scatter map compared with the actual 10-meter wind speed: (c) WRF forecasts in December 2021, (d) VMD-PCA-RF model forecasts in December 2021, (e) WRF forecasts in January 2022, and (f) VMD-PCA-RF model forecasts in January 2022.



Figure 7. The scatter density map compared with the actual 10-meter wind speed: (a) 10-fold cross-validation training set of VMD-PCA-lightGBM model in February 2022, (b) 10-fold cross-validation validation set of VMD-PCA-lightGBM model in February 2022. The 24-hour scatter map compared with the actual 10-meter wind speed: (c) WRF forecasts in December 2021, (d) VMD-PCA-lightGBM model forecasts in December 2021, (e) WRF forecasts in January 2022, and (f) VMD-PCA-lightGBM model forecasts in January 2022.



Figure 9. VMD-PCA-lightGBM, VMD-PCA-RF, and WRF daily variation of predicted and actual wind speeds in December 2021. (The shading areas represent an interval of 1 standard deviation, which is a 68% confidence interval.)

Reviewer 2

Specific comments:

1. The sentence about the GFS in the abstract is hard to understand. I suggest rewording it: We first predict wind speeds using the WRF model, with initial and lateral boundary conditions from the GFS.

Response: Thank you very much for your advice.

We have updated line 24-25 to the following text: "We first predict wind speeds using the WRF model, with initial and lateral boundary conditions from the Global Forecast System (GFS)."

2. Also, I think it's best to get rid of the sentence "When forecasting meteorological elements..." on lines 153-155. I don't think the GFS is "normally" used for WRF. The initial and boundary condition dataset used varies widely depending on your application. I think the four sentences beginning "We use the WRF model..." could be simplified and improved like this (as long as I have captured what you are really

trying to say):

We use the WRF model with forcing from the 0.25° x 0.25° GFS model developed by the National Centers for Environmental Prediction (NCEP). We use the first 90 hours of the daily GFS forecast initialized at 06:00 UTC, with 3-h output, to provide initial and boundary conditions for a daily 42-h WRF forecast, analyzing the 18-42 h forecast and discarding the first 18 h as spin up.

Response: Thank you very much for your advice.

We have updated lines 153-155 to the following text: "We use the WRF model with forcing from the $0.25^{\circ} \times 0.25^{\circ}$ GFS model developed by the National Centers for Environmental Prediction (NCEP). We use the first 90 hours of the daily GFS forecast initialized at 06:00 UTC, with 3-h output, to provide initial and boundary conditions for a daily 42-h WRF forecast, analyzing the 18-42 h forecast and discarding the first 18 h as spin up."