

Geosci. Model Dev. Discuss., referee comment RC2
<https://doi.org/10.5194/gmd-2021-10-RC2>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on gmd-2021-10

Anonymous Referee #2

Referee comment on "Position correction in dust storm forecasting using LOTOS-EUROS v2.1: grid-distorted data assimilation v1.0" by Jianbing Jin et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-10-RC2>, 2021

Comments to "Position correction in dust storm forecast using LOTOS-EUROS v2.1: grid distorted data assimilation v1.0" by Jin et al.

General Comments:

Dust intensity and position errors are commonly found in model studies and difficult to be corrected especially the dust position error. In this study, the authors present a grid distorted data assimilation with the ensemble-based variational (4DEnVar) method to reduce the simulated dust position error for a dust storm event in May 2017 over East Asia. Their results demonstrate that the hybrid assimilation can correct both the dust position and intensity to provide the best initial condition for dust forecast. Generally speaking, the manuscript is scientifically sound and well-written. I recommend accepting it after addressing the following comments.

Major comments:

According to the results, the improvements of the dust simulation and forecast are very limited with the dust emission inversion only. What is happened? Does your model successfully simulate the place and time of the dust emissions? Probably, this is due to you only show the comparisons on May 5. Can you also compare the results on start time

of the dust event probably on May 2 or 3? And it is helpful to show the spatial and temporal differences of the dust emissions between the a priori and the emis inversion experiments.

Specific comments:

- Please add the color bar in Figure 1.
- Page 6 Line 6, Alex desert -> Alxa desert?
- Page 13 Line 20 form "□" from?