

This manuscript tries to look for any potential systematic error in the forecasts through evaluating the ability of three models to reproduce the key processes for mobilization and transport. The dust evaluation was made using satellite and ground-based observations.

General comments:

This study describes the first ever intercomparison of dust forecasts over the western Sahara by using the airborne and ground-based data sets. The result presents that, at monthly scale, large AODs were forecast over the Sahara, a feature observed by some satellite retrievals but mislocated by others over the Sahel. The AOD was correctly predicted by the high-resolution models while underestimated by the low-resolution models. The results are reasonable. However, there are ambiguous descriptions in the paper. I recommend publication after the revisions.

Specific comments:

1. P4, L109, ‘variables at the end of a given 24 h forecast are were passed on as initial conditions at the start of’, ‘were’ or ‘are’?
2. P4, L101-109, The initial and boundary conditions of ALADIN and AROME were taken from operational large-scale ARPEGE forecasts at 18:00 UTC, while two models with different resolution of Meso-NH were initialized by the ECMWF analysis at 00:00UTC. Why don't use the same initial and boundary conditions?

3. To discrepancy of different models' result, what is the main reason?
How about the contributions of initial and boundary condition and the DEAD version?
4. P18, Lin595: What is the reason of the AOD difference between MODIS and MISR? Just because of the number of observations? How about the contribution of retrieval algorithm?
5. The aerosol emission field is not needed to input for models? It is calculated by model itself?
6. What is the height of wind filed used to calculate the dust emission?
Same or not in three models?
7. As shown in the paper, the simulation abilities of three models are different even over same area. How about the land surface situation in each model? Same or different?
8. As shown in L68 on P3, 'The objectives of this intercomparison were to look for any potential systematic error in the forecasts...',
How to ensure the error is systematic and how to eliminate such error in forecasts reasonably?
9. On the research of dust, there are many studies on the dust property and transport basing on the observation and simulation over the world, such as:
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 - Takemura, T., Uno, I., Nakajima, T., Higurashi, A., and Sano, I.: Modeling study of

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- Chen, S., J. Huang, C. Zhao, Y. Qian, R. Leung, and B. Yang, 2013: Modeling the transport and radiative forcing of Taklimakan dust over the Tibetan Plateau: A case study in the summer of 2006, *Journal of Geophysical Research: Atmospheres*, 118, doi:10.1002/jgrd.50122.
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 - Liu, Y., J. Huang, G. Shi, T. Takamura, P. Khatri, J. Bi, J. Shi, T. Wang, X. Wang, and B. Zhang, Aerosol optical properties and radiative effect determined from sky-radiometer over Loess Plateau of Northwest China, *Atmospheric Chemistry and Physics*, 11 (22) (2011), 11455-11463, doi:10.5194/acp-11-11455-2011.
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 - Huang, J., P. Minnis, Y. Yi, Q. Tang, X. Wang, Y. Hu, Z. Liu, K. Ayers, C. Trepte, and D. Winker, 2007: Summer dust aerosols detected from CALIPSO over the Tibetan Plateau, *Geophys. Res. Lett.*, 34, L18805, doi:10.1029/2007GL029938.

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