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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Impact of mineral dust on nitrate, sulfate, and ozone in transpacific Asian pollution plumes" *by* T. D. Fairlie et al.

Anonymous Referee #1

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Overall the paper is well-written, with interesting findings and within the scope of Atmospheric Chemistry and Physics. I recommend publication after addressing the points below.

1. I find the literature review on previous studies that used GEOS-chem (Page 24481: lines:3-9) very limited in the sense that although you have cited an adequate amount of papers, you do not go on to -at least briefly- summarize the main conclusions of each of these studies. You need to do that in order to show why your study is different or more advanced compared to the other studies, i.e. what is the originality of this work.

2. More details about the flights are needed. E.g. flight trajectories, etc..

3. It is obvious that the scaling of the dust emissions (for winds) that you have applied

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is very important. I would suggest the authors to consider doing some sensitivity runs of different scaling. This will show if and in what extend the strength of your results is affected by this assumption/scaling.

4. More details are needed about the thermodynamic model used in GEOS-chem since it is playing an important role in this study. Isn't the MARS-A model a little "outdated" for a study like this considering that other thermodynamic models treat more species (e.g. Ca2+, K+, Mg2+, etc.) and are more up to date? Dr. Meskhidge seems to support the same.

5. I was wondering what the limitations of a study like this are, considering the use of a global CTM versus a regional CTM (with higher resolution). Can the authors comment on that?

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 24477, 2009.