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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Development of a global model of mineral dust aerosol microphysics" *by* Y. H. Lee et al.

Anonymous Referee #2

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Review of Lee et al., Global model of mineral dust aerosol;

This paper is a model presentation/comparison to observation paper, with only the CCN distributions being any attempt to be new. The paper is clearly written, but I recommend the following modifications to the paper to improve the impact of the paper. By. N. Mahowald

1. I would recommend the authors be very clear about what is new science in the paper;as far as I can tell, just the CCN numbers.

2. The CCN numbers with and without dust is the important science in this paper, but I find no discussion of how these things are defined, and what the uncertainty is in these numbers. Also, the mineral dust were there before the humans, so I wouldd like to see

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the change in CCN from humans, and how that number changes since you included mineral dust.

3. There are more data to compare against including the AERONET optical depths in the source regions;maybe use the datasets from Cakmur et al., 2006 and Mahowald et al., in press (iron paper).

4. Please include the budgets for each of your size bins-this may help explain the issues with your dust lifetime.

5. There is data on the size distribution in the source regions from AERONET, which could be used, with caveats, to compare to the model. There is also data at the IMPROVE sites (Virgin Islands and Hawaii) in the fine mode to compare your finer mode.

6. There is some data on wet deposition ratios;see Hand et al., 2004 for review of that data. That could also provide information on why the distance sources seem to have problems.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 18765, 2008.