

Interactive comment on “Model intercomparison of indirect aerosol effects” by J. E. Penner et al.

U. Lohmann (Referee)

ulrike.lohmann@env.ethz.ch

Received and published: 24 April 2006

This paper describes a model intercomparison of the indirect aerosol effect from 3 global climate models using 6 set-ups of different complexity. As always with such an intercomparison, the conclusions are not as straight forward as one would have hoped; which, on the other hand, is very good because it highlights the model-to-model variability on various parameters. The topic is definitely suitable for ACP and I recommend publication after the comments below have been addressed.

The only thing that I am lacking is a discussion of the final results in terms of some other recent intercomparisons of aerosols and the indirect effect, such as the study by Textor et al. (ACPD, 2005); Anderson et al. (Science, 2004) or Lohmann and Feichter (ACP, 2005). Textor et al. specifically focused on aerosol lifecycles and the uncertainty

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper

of emissions. How do your model results fit into there? And how do your indirect effect results compare to the previous estimates of the indirect aerosol effect by the latter 2 studies? The models that you used all seem to be well-behaved, as their indirect aerosol effect does not exceed -1.5 W m^{-2} , which is less than the mean value from 9 GCMs summarized in Lohmann and Feichter and within the “yellow” area of Anderson et al. I would be curious if you had any explanation for that especially as previous results from the LMD, CCSR and CAM-Oslo model were incorporated in the Lohmann and Feichter study. What changed in your GCMs from then to now? In summary, I suggest to use the discussion section to put your results into context.

Detailed comments:

Figure 1: How can the maximum LWP from MODIS be larger than the sum of LWP+IWP? Is that because LWP alone is not interpolated to the coarser resolution. If so, I suggest, that you interpolate that to the same resolution as the sum of LWP+IWP.

Figure 2b seems to be wrong; it looks like as if that were present day LWP instead of the difference in LWP from pre-industrial to present-day.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 1579, 2006.

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper