Atmos. Chem. Phys. Discuss., 9, S117–S118, 2009
www.atmos-chem-phys-discuss.net/9/S117/2009/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Variable CCN formation potential of regional sulfur emissions" *by* P. T. Manktelow et al.

Anonymous Referee #1

Received and published: 3 February 2009

This manuscript deals with the issue of different CCN potential of regional sulfur emissions, which is the result of the fact that aerosols are short lived. The authors use a standard straightforward approach. They use a global model, and they apply the model with and without anthropogenic SO2 emissions. The results are interesting and the manuscript is potentially publishable, when some issues that I am going to address below are dealt with.

It seems to me that the major findings of the research work are:

1. Model dependent.
2. SO2 emission inventory dependent.
3. Domain coordinate dependent.

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4. Nucleation algorithm dependent.

If this is the case a question becomes obvious. Are the findings accurate, or in other words, what is the uncertainty of these findings? The authors have done some work in order to deal with the nucleation rate issue by performing some kind of sensitivity analysis. They have't addressed though the other three issues. It is understandable that the first issue is rather difficult to address at this point. For issues two and three a sensitivity study should give some indication on how sensitive the conclusions are to uncertainties in the emissions, as well as to different definitions of "Europe", "NA" and "Asia". If for example they use the Rasch et al. (2000) domains are used are the results going to be the same or different and by how much? The same applies to the emission inventory. How sensitive are the results to uncertainties in the emission inventory?

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 3095, 2009.

ACPD

9, S117–S118, 2009

Interactive Comment