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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "The effect of harmonized emissions on aerosol properties in global models – an AeroCom experiment" *by* C. Textor et al.

**C. Textor et al.**

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We would like to thank Sven Metzger for his very valuable comment, which helps clarify our conclusions.

We fully agree with his statement that a realistic description of aerosol emissions in modelling is very important and one of the largest uncertainties in aerosol simulations. Crucial information about initial aerosols properties e.g. related to size distribution or composition, is still missing, and the representation of such properties in the models needs to be improved.

We do not intend to minimize the importance of emission input in aerosol simulations. It is indeed very likely that the uncertainty of aerosol emissions is even larger than represented by the emission input diversity in AeroCom ExpA, because only a few



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emission inventories with acknowledged high uncertainties were available.

In our paper, however, we focus on differences among model results, when harmonizing the emission input to models (AeroCom Exp B). The primary intention was to explore if emission-input is the main driver for the simulated model diversity in AeroCom ExpA, where modellers used emission input of their own choice.

We show that even with (almost) identical emissions, the tendencies of individual models remained largely unchanged, and the overall model diversity did not considerably decrease when compared to that of ExpA. This indicates to us, that the simulated fate of aerosols is to a large extent model-dependent and controlled by processes other than the diversity in emission input. Thus, until tests with more diverse emission input are conducted, we have to live with the current conclusions.

We would be happy if our results could influence research directions and encourage more careful model validation and process studies.

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 1699, 2007.