

***Interactive comment on “Distributions and climate effects of atmospheric aerosols from the preindustrial era to 2100 along Representative Concentration Pathways (RCPs) simulated using a global aerosol model SPRINTARS” by T. Takemura***

**Anonymous Referee #2**

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Takemura applies the RCP emission scenarios in his aerosol-climate model and presents the results in this paper. No very surprising results are found. Nevertheless, I do not know any other study that evaluated the implications of the RCPs for aerosol-climate effect in such a thorough manner, and I believe that the paper can be very useful for the analysis of the CMIP5 simulations. The manuscript is written in an excellent style. There are many figures, but this is appropriate given the potential interest in this paper by the model analysis community which calls for some detail.

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So overall, I do not have many remarks, the very few specific suggestions are listed below.

Specific comments: Title: why not “using the global aerosol model...”

p20521 l8: It would be appropriate taking more into account the extended debate on the large variety of cloud microphysical and dynamical responses to changes in the droplet size distribution, beyond the simplistic concept of a cloud lifetime effect.

p20529 l4: But of course, there is an effect on the AF since the background level changes, and the AF, especially the contribution of the indirect effect, changes subsequently.

p20532 l11: The author should comment on why the forcing from fossil fuel POM at the surface is zero although it is not small at the tropopause.

p20533 l7: It would be useful to comment on the larger ice crystals in the Tropics.

Fig. 7: “relative to the preindustrial experiment”: This statement could be clearer here. In my understanding, it is a transient experiment (i.e., with transient imposed SST and SIC) with pre-industrial aerosol emissions that is the reference.

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