

Interactive comment on “Atmospheric aerosols in the earth system: a review of interactions and feedbacks” by K. S. Carslaw et al.

K. S. Carslaw et al.

k.s.carslaw@leeds.ac.uk

Received and published: 11 December 2009

Partly in response to referee concerns, but also to improve the general readability of the paper we have made the following changes:

1. Section 2.1 on biogenic SOA slightly re-ordered to place the quantitative discussion on forcing and feedback all in one place (section 2.1.4 The response of biogenic SOA and associated forcing to environmental change).
2. Subsections in Section 2.2 on PBAP slightly re-ordered and re-named to be more consistent with other sections.
3. Short introductory paragraph summarising the feedback diagrams added to all
C8236

the sections “Feedback processes involving XY”.

4. Section 2.4 Aerosol impacts on terrestrial systems has been shortened and focused more on natural aerosol. Previously it strayed into a wider discussion of all aerosol.
5. Section 3.1 Plankton, dimethylsulphide emissions and sulphate aerosol has been re-ordered to be more consistent with the other sections. It now has sub-sections: 3.1.1 The impact of DMS on atmospheric aerosol; 3.1.2 Feedback processes involving DMS and aerosol; 3.1.3. The response of DMS and associated aerosol forcing to climate change. Much of the lengthy discussion of model processes (previously in section 3.1.3 Models of DMS-aerosol feedback) has been shortened and moved to section 3.4 Summary and status of marine aerosol in earth system models.
6. 3.1.4 Impacts of changes in oxidising capacity on sulphate aerosols, which was part of the DMS section, has been deleted. It was focussed more on all aerosol, rather than natural aerosol, which is the main focus of the paper. Although perhaps still relevant, we felt it distracted from the main flow and message of the paper.
7. Section 2.1.5 Impacts of change in oxidising capacity on BVOCs and SOA has been shortened and subsumed into the text of Section 2.1.4 The response of biogenic SOA and associated forcing to environmental change.
8. Section 6 (Summary) has been changed to be more conclusive about the magnitude of feedbacks by 2100. We include an extra figure to show the magnitude these feedbacks.
9. We have added a sentence to the abstract based on the new summary figure: “Taking into account only the direct radiative effect of changes in the atmospheric

burden of natural aerosols, and neglecting potentially large effects on other parts of the Earth system, a global mean radiative perturbation approaching 1 W m^{-2} is possible by the end of the century”

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 11087, 2009.

C8238