

Interactive comment on “Sensitivity study of dimethylsulphide (DMS) atmospheric concentrations and sulphate aerosol indirect radiative forcing to the DMS source representation and oxidation” by O. Boucher et al.

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We thank the referees for their comments and remarks. We have no fundamental disagreement and the manuscript has been revised to account for most of these comments and remarks. We have decided to keep the section on sulphate aerosol indirect radiative forcing. It is an important finding that the uncertainty on the DMS source turns into an uncertainty on the indirect effect of anthropogenic aerosols, at least the way it is parametrized in models. Our responses to the referees' comments follow.

Previous work: we now acknowledge the paper by Campolongo et al. (1999) and mention some of the previous studies attempting to model the global distribution of atmospheric DMS (Chin et al., 1998; Sciare et al., 2000b; Barth et al., 2000; Chin et

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al., 2000; Koch et al., 1999).

Model description: we have expanded the model descriptions (oxidation of SO₂, treatment of H₂O₂ as a prognostic variable, references regarding IMAGES emissions from biomass burning and lightning).

DMS flux: we phrase differently the fact that our three estimates of the global DMS flux are very close to each other. It may be a coincidence or the consequence that all three oceanic DMS climatologies are somehow scaled to observations, although in very different ways. The “usually accepted” range of 10–40 Tg S / yr refers to chapter 5 of the IPCC (Penner et al., 2001). Jones et al. (2001) also mention a doubling of their global DMS flux upon introduction of the Nightingale et al. parametrization. Note that published estimates of the global DMS flux increase in the same time as new chemical pathways for DMS oxidation are introduced in the models. All DMS fluxes given in the text and Table 2 have been rounded off.

DMS+O₃ in gaseous phase: as mentioned by referee #1 the reaction rate given by Martinez and Herron (1978) is an upper limit. This is now stated in the manuscript.

Comparison to observations: we now mention that the Albatross campaign occurred in the Atlantic Ocean. It is true that available observations are too sparse to evaluate the model, but we think that this study is a good incentive to develop long-term measurements of DMS, as well as accurate measurements of NO₃ and BrO concentrations.

Semantics: our wording (p. 1886, l. 14, referenced by referee 2 as p. 4, l. 16) does not imply that the "widely used" climatology of Kettle and Andreae (2000) is correct. The meaning of the term "significant" used in several places of the manuscript is "important" or "of consequence" as can be found in the dictionary. The term "constrained" has been removed from the abstract as it was not appropriate. We also accounted for all the minor editorial corrections suggested by the referees.

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