

Interactive comment on “Parametric sensitivity and uncertainty analysis of dimethylsulfide oxidation in the remote marine boundary layer” by D. D. Lucas and R. G. Prinn

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Received and published: 25 April 2005

Comment 1: "... stress should be here done in order that the authors will better underline how important is DMS atmospheric oxidation role in controlling the levels of aerosol in the marine boundary layer. The importance of some DMS oxidation formed species (primary and secondary) such as SO₂ and H₂SO₄ in aerosols formation should be as well better underlined in order to even more convince on the importance of the performed study and analysis."

Reply to Comment 1: The connections between DMS oxidation products and the formation of aerosols in the marine boundary layer remain elusive. Recent reports (e.g.

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Weber et al., GRL, 1999; Cainey and Harvey, GRL, 2002; Lucas and Prinn, GRL, 2003), however, suggest only a limited role for DMS oxidation products such as H₂SO₄ to contribute to aerosol formation in the marine boundary layer. We have therefore decided to focus on the gas-phase DMS oxidation chemistry, for which a large set of uncertainties still remains. We focus on DMS, SO₂, MSA, and H₂SO₄ because the gas-phase concentrations of these species are commonly measured, and thus our analysis will be useful to the researchers who make these measurements. In the last paragraph of the revised introduction, we now provide a better explanation for why our analysis is for these species. We also mention the connections between DMS products and aerosols at the beginning and end of the introduction.

Comment 2: "In Section 2.1.1 statements by the authors should be made even clearer in order to underline how previous laboratory studies really contribute at clarifying the oxidation mechanism of atmospheric DMS (Atkinson et al., 1984; Hatakeyama and Akimoto, 1983; Hynes et al., 1986)."

Reply to Comment 2: We have greatly improved the discussion of DMS oxidation chemistry in Section 2.1.1. We now describe the major pathways and branching points leading to the species under consideration. References are also included in the places where the Lucas and Prinn (2002) mechanism has been altered. We feel, however, that a full exposition of DMS chemistry would be too repetitive with the excellent reviews that are already published (e.g. Urbanski and Wine, 1999). Instead, we provide appropriate references to the specific mechanism in this paper and to DMS chemistry in general.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 6379, 2004.

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