

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

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The referee made the general comment that the paper read as an overview of natural aerosol interactions. Actually this was intended but the title clearly wasn't appropriate. We have therefore changed the title to “A review of natural aerosol interactions and feedbacks within the earth system”. A review of all aerosols would need to fully include the impacts on the carbon and nitrogen cycles, which would make the paper even longer and unreadable. We have gone right through the paper to emphasize the natural aerosol and de-emphasize or delete discussion of anthropogenic aerosol effects.

A second general comment was that the Conclusions could highlight more what doesn't need to be investigated. We think the best way is to highlight the important research needs. To do this we have split the main table into 5 smaller tables and given more

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space (new columns) to a ranking of research priorities. The tables now appear in the relevant sections.

Section 2. We have changed as suggested to read: “The terrestrial biosphere emits primary biological aerosol particles (PBAP) and trace gas species that oxidise to give products that can partition into the particulate phase to form SOA”

Section 2.1. We modify as suggested to read: “Molecular marker methods and ¹⁴C analysis suggest that modern carbon from biogenic VOCs, biomass burning and meat cooking dominate organic carbon aerosol even in urban locations (Hallquist et al., 2009, and references therein).”

Section 2: The referee notes that sources need not sum to 100

Section 2.1.3: Removed reference to Hari et al. (2008).

Section 2.1.3.1 Changed Mercado et al. (2009) from submitted to published as suggested.

Section 2.1.3.1 We have abbreviated this section as suggested – see response to Referee 1.

Section 2. “Model studies predict”. Odd language. We are not sure what the referee means here.

Section 2.1.3.1 This sentence has been removed.

Section 2.2. We emphasise that the estimates of the emission source of PBAP is very uncertain.

Section 2.3.1. BC efficacy. It is a local value. Wording changed.

Section 2.4.2. The sentence referred to deposition not emission.

Section 6. Conclusions. We addressed this at the start of our response.

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