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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Direct radiative effect of aerosols emitted by transport: from road, shipping and aviation" *by* Y. Balkanski et al.

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Responses to Reviewer 1: Review of "Direct radiative effect of aerosols emitted by transport: from road, shipping and aviation" by Y. Balkanski et al. submitted to Atmos. Chem. Phys. Discussion (acp-2009-713).

We would like to thank the reviewer 1 for his useful comments and for the corrections that were suggested. In italics we reproduce the comments and in regular font our reponse

1. Page 1661, Lines 2 to 10: This part should move before the last paragraph in Section 1. DONE.

2. Page 1662, Lines 21 to 22: Are all emission inventories annual mean data? Road

transport and shipping are prescribed yearly as their annual seasonal variations are small. Aircraft transport is prescribed monthly to account for the variations in traffic. We have added a sentence in each paragraph relative to the description of the emissions

3. Section 2.3: It should be described that the emission inventory from aviation is three-dimensional data. DONE.

4. Page 1665, Lines 6 to 7: Please indicate a reference of International Energy Agency fuel data. The reference is now indicated.

5. Page 1666, Line 3: An abbreviation "LMD" appears first here. Then a long name is also described. The long name for LMD has been added.

6. Section 2.4: Basic information of a LSCE model including aerosol transport processes and horizontal/vertical resolutions should be described. Integrated and spin-up periods should be also described. We have added the information in the text.

7. Page 1669, Line 13: A spin-up period should be described. DONE.

8. Page 1672, Lines 4 to 5: Revise "The absorption extinction ..." to "The absorption and extinction ...". DONE.

9. Page 1675, Line 20: Revise "4.10ËĘ-5 kg/kg" to "4x10ËĘ-5 kg/kg". DONE.

10. Page 1675, Line 24: Revise "4.10ËĘ-4 kgS" to "4x10ËĘ-4 kgS". DONE.

11. Page 1676, Line 26: Change "(NH4)2SO4" to "sulfate" because the expression (NH4)2SO4 is not used in previous sections. DONE.

12. Page 1676, Lines 26 to 27: Revise "which will depend on the treatment of relative humidity" to "which will be affected by the treatment of hygroscopic growth depending on the relative humidity". DONE.

13. Page 1677, Lines 8 to 13: This part is a repeat of the previous three paragraphs. Therefore it should be deleted or incorporated into the previous three paragraphs. We

prefer to keep the information that relates to BC state of mixing. It was incorporated into the paragraphs following the reviewer's suggestion.

14. Table 1: Revise "aerosol optical depth" to "aerosol optical depth (AOD)" in the caption. DONE.

15. Table 1: Revise "Ktonnes yrËĘ-1" to "Emission (Ktonnes yrËĘ-1)". DONE.

16. Table 1: Values of OC from aviation subsector should be presented even if they are smaller than those of BC. We added this text and included values for OC in Table 1. "The emissions of organic condensate from aviation are highly uncertain, Lee et al. [2009] report a range for the emission factor from 0.0065 to 0.05 g/kg fuel, using assumptions of constant particle diameter and a density of 1g cm-3. We take the upper limit of this range to estimate maximum values for organic carbon produced from aircrafts (Tab. 1)."

17. Fig. 1: Is the horizontal distribution of aircraft emission column-integrated? Yes, this precision has been now added to the figure caption.

18. Figs. 2, 3, 4, 5, Tables 2, 3, and 4: Are the forcing values under the all-sky condition? We present all-sky values of aerosol forcing and we have added the term 'all-sky' to all figure captions and in the Tables when appropriate.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 1659, 2010.