

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

Anonymous Referee #1

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A primary purpose of this manuscript is to estimate the direct radiative forcing due to sulfate, black carbon, and organic carbon aerosols originating from transport activities including road, shipping, and aviation with chemical transport models. A method of the estimation is appropriate, and estimated direct radiative forcings can contribute to reliable assessment of climate change by anthropogenic activities. Therefore I suggest that it is suitable to be published by Atmos. Chem. Phys. after revisions indicated below.

1. Page 1661, Lines 2 to 10: This part should move before the last paragraph in Section 1.
2. Page 1662, Lines 21 to 22: Are all emission inventories annual mean data?

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3. Section 2.3: It should be described that the emission inventory from aviation is three-dimensional data.
4. Page 1665, Lines 6 to 7: Please indicate a reference of International Energy Agency fuel data.
5. Page 1666, Line 3: An abbreviation "LMD" appears first here. Then a long name is also described.
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.
7. Page 1669, Line 13: A spin-up period should be described.
8. Page 1672, Lines 4 to 5: Revise "The absorption extinction ..." to "The absorption and extinction ...".
9. Page 1675, Line 20: Revise " $4 \cdot 10^{-5}$ kg/kg" to " $4 \cdot 10^{-5}$ kg/kg".
10. Page 1675, Line 24: Revise " $4 \cdot 10^{-4}$ kgS" to " $4 \cdot 10^{-4}$ kgS".
11. Page 1676, Line 26: Change "(NH₄)₂SO₄" to "sulfate" because the expression (NH₄)₂SO₄ is not used in previous sections.
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".
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.
14. Table 1: Revise "aerosol optical depth" to "aerosol optical depth (AOD)" in the caption.
15. Table 1: Revise "Ktonnes yr⁻¹" to "Emission (Ktonnes yr⁻¹)".

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16. Table 1: Values of OC from aviation subsector should be presented even if they are smaller than those of BC.

17. Fig. 1: Is the horizontal distribution of aircraft emission column-integrated?

18. Figs. 2, 3, 4, 5, Tables 2, 3, and 4: Are the forcing values under the all-sky condition?

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