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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Simulating the global atmospheric black carbon cycle: a revisit to the contribution of aircraft emissions" *by* J. Hendricks et al.

J. Hendricks et al.

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We would like to thank the referee for her/his comments which helped us to achieve major improvements of the manuscript.

Reply to 'General Comments':

We agree with the referee that the descriptons of the methodologies were too long winded and lacked structure in the original manuscript. Therefore, we reorganized and shortened the methodology descriptions (see below).

Replies to 'Specific Comments':

1) We reorganized and shortened the descriptions of the methodologies given in section 2.4 and the appendix of the original manucript. To avoid cross-references between

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the methodology descriptions in the main body of the text and the appendix, we integrated the descriptions of the appendix into the main text. We further shortened these descriptions trying to emphasize the most essential points. We included subsection titles to make the description more clear. The most essential features of our approach to estimate particle number concentrations are clearly discussed in the beginning of the descriptions (Sect. 2.5.1 in the revised manuscript). We further added a flow chart showing the major steps of the approach.

2) We included information on the accuracy of the EIs as well as a comment on the potential impact of uncertainties in the EIs on the main conclusions (Section 2.3).

3) We extended the abstract following the recommendations.

4) We added information on the role of aircraft emissions in the different simulations to Sect. 3.2.3. We also included a discussion on the potentially large contribution of surface sources to the UTLS BC budget which is indicated by the different model results (2nd-to-last paragraph of Sect. 3.2.4 in the revised manuscript). Unfortunately, it is currently not possible to evaluate the overall quality or to estimate the error of the different models, since only a very limited number of BC observations in the UTLS is available. We discuss that in detail in Sect. 3.2.2 and included a corresponding comment in Sect. 3.2.3.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 3485, 2004.