

Interactive
Comment

Interactive comment on “The global impact of the transport sectors on atmospheric aerosol in 2030 – Part 1: Land transport and shipping” *by* M. Righi et al.

M. Righi et al.

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We are grateful to the reviewer for accepting to review our manuscript, after having reviewed the companion paper as well. Detailed answers to her/his comments are given in the following (*italic: reviewer's comments*, roman: author's reply).

However, one thing is puzzled me throughout reading the second paper. The first paper for 2000 simulations including all the transport sector: land transport, shipping and aviation. Why this paper for 2030 simulations does not include aviation sector. In

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the end, the author pointed out there should be a third paper for the aviation analysis. I think for the consistency and more logical way, the aviation results should be included into this paper. Are there any specific reasons for the authors to decide a separate paper for the aviation as the third paper in the series?

The reason for separating the paper in two parts is twofold. First, we wanted to avoid having a 30-pages paper, which is usually less attractive for the readers. Second, the ground-based transport (land and shipping) and the aviation sectors are usually of interest to two different communities. Therefore we think it is more appropriate to have two separate (and shorter) manuscripts addressing two different target audiences.

In section 2 - model and simulations, page 22991 and line 25-30, the statement is not very clear. Whether the future period for 2030 using the same meteorology as the present period for 2000 in order to investigate the emission changes effects? If so, it should be state more clearly.

Yes, the reason for using year 2000 meteorology (and for prescribed long-lived species concentrations) is to isolate the effect of changing emissions of short-lived compounds from the effect of a changing climate. We rephrased the corresponding paragraph to make this point clearer, as follows: “Note that, although the simulations of this paper consider 2030 emissions, the concentrations of radiatively-active gases are prescribed using the same fields as Righi et al. (2013), corresponding to year 2000 conditions, and the model dynamics (vorticity, divergence, temperature, and surface pressure) is nudged using the European Centre for Medium-Range Weather Forecast (ECMWF) data over the 1996-2005 period. This might appear inconsistent but it is a necessary choice in order to distinguish effects of the emission changes on aerosol and aerosol-induced climate forcing from the effects of climate change on atmospheric aerosol. As mentioned above, the latter effects are not covered in this work, but will be the subject of future investigations.”

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