

Interactive
Comment

Interactive comment on “Response of secondary inorganic aerosol concentrations and deposition fluxes of S and N across Germany to emission changes during high PM₁₀ episodes in spring 2009” by S. Banzhaf et al.

Anonymous Referee #2

Received and published: 18 July 2013

General comments:

In this paper by Banzhaf et al., a CTM model is used to study the origin and characteristics of high PM events in Germany during spring 2009. By applying a number of emissions scenarios the formation of secondary inorganic aerosols (SIA) is studied in detail with the model. Especially the non-linear response in the chemistry and subsequent deposition fluxes of important air quality species is discussed. The impact of cloud chemistry in the model is also discussed. The issue of non-linearity in the re-

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sponse to emissions changes is very important in relation to e.g. planning of future national and international emission targets.

It is all in all a very interesting paper focusing on an important and complex scientific issue related to modelling of air chemistry. The paper gives a detailed description of the applied methods and analysis. The only negative point is the language, which seems to be somewhat influenced by the German language structure.

The topic of the paper and the methods as well as conclusions is of relevance for the readers of ACP. I recommend the paper for publication after some revisions, see suggestions below.

Specific comments:

The title reflects the content of the study – but it is not very easy to read. I advise to find a shorter and more “fancy” title.

I am not native English speaking myself, but to me the language in the paper is a bit hard to read – the sentences are very long and “German”. You should go through the paper and divide several of the sentences and/or include more commas. An example of such a sentence can be found on page 15802: “In these regions SIA formation is limited by the availability of NH₃ while in ammonia-rich areas SIA formation is limited by HNO₃ as even following a reduction of NH₃ a sufficient amount of NH₃ remains to neutralize the available HNO₃.”

In section 4.3.2 you discuss and compare a lot of numbers – it would help the reader if these numbers were included in a table. It is e.g. hard to keep track on which numbers to compare in order to find the impact of the non-linearity.

Fig. 9. Why not include the base case directly in the plot (and not only the numbers). It might help the reader to “visualize” the changes.

As also mentioned by the other reviewer, a few more details on the applied emissions setup (e.g. temporal variation) would be appropriate.

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Technical corrections:

p. 15789. Lin. 16 “..the German and . . .” change to “..the German domain and . . .”

p. 15802. Lin. 6. “Fagerli et al., 2008” should be “Fagerli and Aas . . .”

p. 15806. Lin 28. ”region” -> ”regional”

p. 15807. Lin. 1. ”The sensitivity 1” remove “1”?

p. 15810. Lin 9. Delete “ten”?

p. 15811. Lin 12. Remove “1”?

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 15783, 2013.

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