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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Uncertainties in SOA simulations due to meteorological uncertainties in Mexico City during MILAGRO-2006 field campaign" *by* N. Bei et al.

Anonymous Referee #3

Received and published: 20 September 2012

This paper analyzes the importance of meteorological uncertainties on aerosol simulations for Mexico City using the WRF-Chem model. The study is methodical and the results are relevant to the evaluation of aerosol simulations. Publication is therefore recommended in ACP, subject to a few minor revisions outlined below. (Note only the last 2 digits of page numbers are used)

General Comments:

1. Section 6 (". . . other initialization method") seems to be included as an afterthought, and the conclusions drawn from it (pg07, ln10) are possibly an over interpretation. I would recommend including the description of the second method with the initial

method (Section 2, pg98). Figures 2 and 12 could be merged which would make it easier to see the difference. I suspect that the conclusion is that there is not much difference between the methods. Concluding that therefore large scale features dominate the uncertainties (Pg07, ln9-12) seems like a stretch.

2. Pg06, ln6-9 Mentions very briefly other sources of uncertainty. I would recommend merging this with (Pg7, ln9-12) and expanding the discussion a bit, especially with more references if possible. The study has not evaluated the uncertainties due to model parameterization and input fields other than the meteorological fields. Evaluating these may belong to a future study, but there should be more mention of them here.

3. In addition to comment 1 above, I would like to see some more detail of the ensemble initialization methods rather than relying entirely on the references. Would it not make sense to show average met fields in Fig 2 to be able to compare with the spread used for the ensembles?

Minor Comments:

1. Pg94, ln19-20: What does this mean? Do you mean "the same ratio" instead of "significance"? There are only 2 episodes, so care should be taken before making such a general claim – from Figs 4, 5, 10 and 11 it seems that the ratio of ensemble spread to mean does vary quite a bit.

2. Pg99, ln13: I found the use of brackets to explain 2 things at once detrimental to the flow of the paper. I would strongly recommend eliminating this to be clearer – even if it means that the paragraph will be longer and there will be some repetition. This method is applied multiple times in the paper (eg. Pg02, ln5-12) and I would recommend removing it everywhere, including when "[SOA] ([POA]) " is used. (Although in some instances, it seems that "[SOA] ([POA])" is used when you just mean "[SOA] and [POA]".)

Technicalities: 1. Fig 1: Could you mention the terrain heights / intervals in the caption?

ACPD

12, C7171–C7173, 2012

2. Fig 4: Is the caption wrong? It looks like reference is the blue line and best member is the orange line. 3. Pg02, ln03: “attribute” is not used correctly. 4. Pg06, ln07: “midnight” instead of “the midnight” – please check manuscript for other incorrect uses of “the” 5. Pg07, ln13: “It is worth mentioning” or something like that instead of “It is worthy to note”.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 16293, 2012.

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12, C7171–C7173, 2012

Interactive Comment