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Interactive comment on “Impact of external industrial sources on the regional and local air quality of Mexico Megacity” by V. H. Almanza et al.

Anonymous Referee #3

Received and published: 11 December 2013

This paper uses WRF-Chem and WRF-Flexpart to evaluate the impact of the Tula Industrial Complex on air quality in Mexico City and identifies possible impacts from other external sources that have received less attention to date. The results are policy relevant and the methodology is sound. Publication is recommended after minor revisions.

Minor Comments: In general, the paper is rather wordy. Maybe a few passes could be made to tighten up the language and leave out some material. For example, the list of megacity campaigns (pg 26581) is not really needed in this article.

pg26582, ln11-17: The impacts of regional sources on cities is highly dependent on geography. Hence studies for Europe may not be relevant here as neither the topography nor the geography of the built environment is similar to Mexico City. I would

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recommend limiting this whole sub-section (until the following page, In18) to Mexico City.

Furthermore, the paper should be more careful to distinguish between SO₂ impacts and other impacts (mainly O₃). A casual reading of the paper may get confused about which reductions are for which pollutant. In order not to give a misleading impression, it would be good to clarify that SO₂ is not at present a health concern, whereas O₃ (and especially aerosols) are.

Pg26588, In21-23: What does this mean? What were the other tests performed?

Pg26589, In3-4: Is this part of the sensitivity tests that were not shown? This section should be clarified. Maybe a table should be included in supplementary material to show the improvement due to FDDA. I'm not sure In8-10 are necessary.

The results subsections could be clarified: Flaring could be 3.2.4, and the SO₂ reductions tests (pg26599 In13 on) could be 3.2.5. It seems that only SO₂ emissions are reduced for these tests. This should be clarified. This should also be stated clearly in Table 3. Maybe also spell out that TIC = MHR + FPRPP, and that the other tests include full MCMA emissions?

Pg26601, In15-29: This is speculation at this point. I think either there should be some WRF-Chem simulations to support this or it should be removed.

Pg26603, In2: Please clarify the text to say that the emissions estimates of flaring are from a separate publication. At present the text is ambiguous. Also, "can be significant" could be quantified at this point.

In the conclusions, please quantify the impact on "regional emission dynamics" - from the results presented in the paper, the impacts are present but nonetheless small compared with the emissions in the MCMA.

Technical details: pg26580, In10: "noticeably high" is not grammatically correct

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pg26580, ln16: add acronym (TIC)

Fig 4 Caption: "including the high SO₂ episode in the EI" - don't you mean including the Tizayuca source in the EI instead?

Fig 8: Please clarify caption and labeling and zoom in on area of interest to make this figure clearer.

pg26586, ln6: should be grid cells instead of nodes?

pg26603, ln6-7: "and possibly are" needs correcting, eg. "could be underestimated, possibly due to ..."

Please be consistent in usage of "MCMA" and "Mexico Megacity"

There are instances where it would be preferable to say "***the*** Tula refinery" instead of just "Tula refinery," for example pg 26597, ln13 and 18.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 26579, 2013.

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