

Interactive comment on “InMAP: a new model for air pollution interventions” by C. W. Tessum et al.

Anonymous Referee #2

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1 General Comments

The paper discuss the formalization and implementation of a new, simplified model, to be used for the fast evaluation of emission scenario impact over a certain domain. The work is of great interest for the air quality fields, and the presented paper show the great effort performed by the authors in order to explain their idea and results. The main issues to be solved before publication that I noticed are related to the presentation of the results (see specific comments).

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2 Specific Comments

The work is well structured but some issues have to be addressed before the publication in order (1) to help the reader to better understand the formalization and (2) to show a more exhaustive evaluation of the presented model. In particular:

1. In the introduction the authors should mention other model/approaches used to allow fast simulation of the scenario impacts on AQ. There are a number of work (and also European project) related to this, in to physical/nonphysical model. See fairmode.jrc.ec.europa.eu, www.appraisal-fp7.eu as examples.
2. The methodology is well explained but probably a table presenting what are the data computed pre-processing wrf-chem models for each of the section 2.1 will help the reader and the possible interaction of the authors with other group in the reproduction of the approach/test on other domain and with other models.
3. The results are the part needing the major effort by the authors.
 - (a) Even if the scenario are presented in other works, a resumming table presenting the emission change with respect a base case or the emission levels have to be presented here, in order to allow a better interpretation of the results.
 - (b) I suggest to start from the evaluation with respect the measurement (3.3) and then starting the larger discussion on emission scenario reproduction.
 - (c) Figure 2: how the scenario selection has been performed? I suggest to add a differences map (i.e. with respect wrf-chem maps) allowing a better presentation of the differences in the results.
 - (d) I think the best way to evaluate this kind of model is comparing the responses with respect emission change. If you have a base case (used in

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3.3?) you can show not the values of the index itself (population- or area-weighted) but how this change. In this way you can appreciate if/when the model shows a completely different from wrf-chem and/or cobra. For example, is the InMAP model usually more/less sensitive to the emission change of some PM2.5 precursors?

- (e) A good way to evaluate models to be used for scenario analysis could be found in the frame of the fairmode planning working group. I suggest to at least cite this possibility, showing the differences in your evaluation approach, its limitations and strengths.
- (f) The impact of the correction factor could be investigated, for example adding a section on sensitivity of response to F and KNH (optional, on the basis of the length of the paper resulting after revisions)