

Interactive comment on “Regional atmospheric composition modeling with CHIMERE” by L. Menut et al.

Anonymous Referee #2

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This paper gives an overview of the parameterizations in the standard CHIMERE model configuration for regional atmospheric composition modeling. Also available optional parameterizations are described, along with a brief discussion of their respective performances. Also a glimpse of the historic perspective and outlook for future developments is given. From the manuscript it is clear that CHIMERE is used in a wide variety of applications, and the manuscript seems not have the intention to document the performance of a baseline CHIMERE model version. However, for an outsider it is unclear which version of CHIMERE this manuscript refers to and how version control is managed in practise.

Furthermore, due to the scope of the manuscript, it is quite lengthy. Also it provides many types of information that does not necessarily be part of a peer-reviewed

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publication. Especially the historical perspective, mentioned at times throughout the manuscript, and various presentations of the model illustrated with figures is rather anecdotic and does not yield quantitative information. The reader is rightly referred to relevant papers though. I acknowledge that having this information combined with the technical details in a single manuscript makes it more useful as a reference model description paper. Therefore I don't object, but also don't have many comments on these aspects.

The manuscript is generally reasonably well written, although the English formulation would benefit from a textual revision. I recommend this manuscript to be published in GMD after responding on the comments given below, and after a double-check on the language mistakes (some of them I mention in the technical comments).

General comments:

Abstract: The abstract reads like an anecdote of what CHIMERE is and what it used for. It should be made clearer what can be expected in the manuscript. Therefore I recommend to include in the abstract one (or two) sentence(s) like: "In this paper all numerical and scientific choices in CHIMERE are described in detail, as well as ongoing and planned developments."

P209, L15: In this section I miss a description of the code management procedure, and the actual version name, or number, of the model as described in this manuscript (see also my comment above). How often is the standard CHIMERE software being updated? Is standard version performance in some way being monitored, guaranteed, and/or documented?

In conclusions I miss a summary of the strengths and weaknesses of parameterizations as adopted in CHIMERE, as could be composed from the extensive model description given before. This could form the basis of a set of recommendations for improvements of existing parameterizations.

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Now it seems the summary mainly consists of an outlook of future applications of CHIMERE. In the current form I would also suggest to rename this section “Conclusions and Outlook”.

Otherwise, considering that the subsections, e.g. Sect. 13.3: “Heavy metals”, is rather lengthy and don’t really fit as a “conclusion”, the authors may want to move these subsections outside the conclusions, e.g. including a new “specific applications” section just before.

Technical comments:

P205, l 9-10: “. . . quantified within chemistry-transport models (CTMs). The offline CTM CHIMERE uses. . .

P206, l 6: “sulphur dioxide”

P206, l 11: “action” -> “influence”

P206, l 12: “inaccurately” -> “incorrectly / erroneously”

P206, l 7: “. . . and the results of recent studies.” Which results? What aim? Please clarify briefly.

P208, l 3: “than” -> “as”

P209, l 12: “One goal of this paper is to describe in detail all. . .”

P209, l 16: “CHIMERE is available under. . .”

P209, l 24: “. . . to the users of the model.”

P210, l 16: “. . . from a Cartesian. . .”

P213, L24-L25: Consider reformulation of this sentence; please align with p228, l5.

P215, l 1, “. . . classes, the CHIMERE land. . .”

P215, l 6: “. . . whole simulation period.”

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P224, I10: "When it is. . ." Please consider reformulation (break-up) of this sentence.

P225, I3: ". . . simple 1st order numerical schemes. . ."

P227, I9: ". . . due to the neglect of. . ."

P230, I8: Timmermans et al., 2009. It is a bit confusing to see the reference to Timmermans wrt the use of the TNO inventory. I would expect a reference to "van der Gon et al." or so.

P231, I2: ". . . are key in pollution. . ."

P231, I6-10: Consider reformulation (break-up) of sentence. Consider the language use.

P231, I19 : ". . . two distinct stages (see Fig. 9):"

P232, I12: "TNO" please include appropriate reference (see comment above)

P232, I18-I22: consider reformulation of sentence.

P238, I26: "experiment" should be "development".

P239, I3: It is a bit confusing to read once again a section on dust emissions. Please merge this section with sec. 6.3, or make more clear the distinction between the two sections.

P244, I9-I17: remove these two obsolete sections.

P251, I13: ". . . scheme for SOA formation implemented. . ."

P256, I3: "corrections": What kind of corrections are those? Please clarify briefly.

P256, I8: "Impact of clouds on photolysis": Please make more clear what is the recommendation. Also it might be interesting to learn about the magnitude of degradation when one of the simplified assumptions for evaluation of COD is selected.

P257, I24, P258, I14: ". . . irreversible. . ."

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P259, I21-I22: Consider reformulation of sentence.

P261, I29: "previsibility" -> "forecast performance"

Figures: It seems not all figures are referred to from the text (e.g. Figs 3/9/10). Please check.

Interactive comment on Geosci. Model Dev. Discuss., 6, 203, 2013.

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