

Interactive comment on “Curriculum Vitae of the LOTOS-EUROS (v2.0) chemistry transport model” by Astrid M. M. Manders et al.

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The idea of a curriculum vitae for the LOTOS-EUROS model, which is one of the most famous and efficient chemistry-transport model in Europe is very interesting and welcome in this period when, as mentioned by the authors such models have reached a certain level of maturity. The article also introduces some history about the development of air quality models over the twenty past years which is also well documented. As a general comment, we have here a good and relevant paper. The main added-value of this paper is to explain the history of a chemistry-transport model like LOTOS-EUROS, the drivers that led to the current open-source version, the current and future challenges. In that perspective it would have been interesting to get more details about the merging process between both initial models LOTOS and EUROS. EUROS is briefly

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described compared to LOTOS and how the Dutch teams managed to get only one model is not really explained although this is a quite original approach. For instance, it would be relevant to know how the experts selected the model parametrizations, etc ... (in paragraph 2.1).

I understand the authors decided to tell a story avoiding equations describing more in detail the model (this is not a peer-reviewed model description). This choice is valuable to focus on the model development strategy, but as a consequence, some parts of the paper may remain a little unclear for non experts readers (reference to EnKF method and VBS model in paragraphs 6.1 and 6.4 for instance or the paragraph on emissions modelling -6.3- which may be confusing for someone who did not understand that emissions modelling is a part of the CTM). Also, the discussion on high resolution runs (page 22) is relevant but not conclusive (finally is the combination of LOTOS-EUROS and OPS the most promising approach? addedd avlue of the plume-in-grid?) I would recommend to review those paragraphs and to amend them with few more explanations.

This paper is pleasant to read for air quality modellers who share the authors' concerns and philosophy but may be more difficult for people outside the field. It is mainly due to the fact that a number of references and definitions, useful for good understanding, is missing . I have noted the following terms used without any explanations: GEOSS, PoDY, Ensemble approach, NO_y, SDS-WAS and some references to models : HARMONIE, COSMO, VBS, OPS... few words to introduce them are necessary.

Please not that schemes provided on figure 2 are very difficult to understand, and for this reason are almost useless. It is necessary to revise and simplify them, making the acronyms more explicit and focusing on the key messages those schemes are supposed to bear. The other figures are correctly chosen. I would just recommend to add, if possible, a representation of modelling fields or their performances with assimilation of satellite information. This aspect is well discussed in the paper but not illustrated.

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A good point is the extensive bibliography provided. However, I would recommend to add a reference (for example page 4 line 15 with Menut et al. 2013) to the last peer-reviewed paper related to the evolutions of the CHIMERE model (<https://www.geosci-model-dev.net/10/2397/2017/>).

Here are a number of typo corrections I noted: - Page3 line 16 a parenthesis is missing after 1972; - Page 16 line 31 "months" instead of "mont", - Page 21 line 26 a dot is missing - Page 22 line 17, add a "s" to "application", - Page 22 line 18 "from" instead of "form", line 19 add a reference for HARMONIE and COSMO (at least institutes that develop them), - A number of times in the text PM10, PM2,5, NO2 or NOX are written without indices - Check the References to "Collette", the correct name is "Colette"

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