

Interactive comment on “The 1-way on-line coupled model system MECO(n) – Part 4: Chemical evaluation (based on MESSy v2.52)” by M. Mertens et al.

Anonymous Referee #1

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General:

The paper is the fourth part of a paper series about MECO(n), an on-line coupled model version of COSMO-CLM and EMAC. In this paper tropospheric chemistry is discussed in detail for the first time. The model results are compared to different observations. Potential problems in the model system are discussed in a sufficient way. The paper is well written and I only suggest some minor corrections. Therefore the paper should be published in GMD.

Minor corrections:

As this is the fourth part of a paper series about MECO(n), can you please add a few

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words about part 1 to 3 in the introduction?

p.3, line 30: Please tell the reader where this emission data set is published or described. Published elsewhere is not enough.

Chapter 2.1: In the introduction you write that one of the advantages of MECO(n) is that for standard CCMs "current computational resources pose an upper limit". Here you write that you have to exchange data between the different instances (which also costs time) and that there are additional waiting times for data exchange. Can you give an estimation how much time you save in total compared to doing a high resolution EMAC simulation?

p.6, line 24: You say that you don't consider Averaging Kernels (AK) in your comparisons and therefore you focus on horizontal patterns. This is only possible if AKs do not change in horizontal direction. Probably that is not a problem but can you please check?

p.7, line 22: Here it may sound as the cold bias is due to the coupling but I guess it is the same known problem in COSMO-CLM you mention on page 14. Please also add a short remark here.

p.8, section 4.2: Please clarify where height corrected values are used and where not. Especially in the beginning of the section I don't know if height corrected values are used or not.

In figure 6 the highest values for the height corrected values seem to appear in Belgium/Netherlands and near Nantes (France). Both areas seem to be rather flat. Can you explain why you have the highest corrections there?

Height correction: Can you please give a short description (maybe in the appendix) how the height corrected values are calculated? Is it just scaling with pressure or is it something more complicated?

p. 19: MECCA: Can you please specify which version of the recommendations from

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JPL you used? Meanwhile the newest version is from 2015, which (according to your supplement) is not used.

Technical/Typos:

p.1, line 7: "... and a one ..."; change to "... and one ..."

p.3, line 25; p.8, line 33: line too long (happens several times)

p.8, line 5: "we are do not present" → we do not present

p.8, line 15: Atlantic sea → Atlantic ocean

p.9, line 28: located in?

p.13, line 13: mixing ratios

Interactive comment on Geosci. Model Dev. Discuss., doi:10.5194/gmd-2015-269, 2016.