

***Interactive comment on* “The 1-way on-line coupled atmospheric chemistry model system MECO(n) – Part 3: Meteorological evaluation of the on-line coupled system” by C. Hofmann et al.**

Anonymous Referee #2

Received and published: 14 September 2011

This manuscript deals with the evaluation of the model system MECO(n), in which the global model EMAC and the regional scale model COSMO have been online coupled. Simulations are performed for three different meteorological situations and a comparison it is compared how the model system MECO(n) performs in comparison to COSMO simulations driven by ECMWF analyses. The online/offline simulations are compared to the corresponding ECMWF analyses and precipitation observations. The manuscript is the third part in a series of papers about the MECO(n) model.

General comments: My concern goes to the scientific level of this manuscript. For this reason, some changes and extensions are necessary before publishing. The sugges-

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tions are given below.

The motivation behind the online coupling should be made clearer, even though this is the third part of a series of manuscripts. It is only shortly mentioned in the introduction.

I also find parts of Section 2 and Section 3 difficult to follow. Firstly, to my opinion a model description is more appropriate before describing the evaluation strategy. Secondly, information about the namelist setups and storage of data on disk (sect. 2) should either be explained more in detailed or mentioned at another place. This would fit better in the model description section. In addition, Fig. 1. seems to have an error in the top left panel.

Much focus of the evaluation is put on the importance of the lead time of the simulations. I would suggest a more comprehensive discussion on why the lead time may influence the results. “Accumulated errors” are mentioned in the conclusions; please be more specific. Furthermore, please comment on previous findings on this subject. For future applications, general conclusion about the sensitivity on how the starting time of the respective simulations (global/regional) may affect the performance of the models should be highlighted.

One of the main conclusions is that “MECO(n) is able to simulate key mid-latitude weather systems as accurately as present-day regional weather models”. This conclusion gives the impression that the online coupling has not improved the performance of the models. It should be clearer what really is the outcome/use/advantage of this coupling. In addition, as the scope is to perform simulations for atmospheric chemistry etc., I would suggest adding a discussion on how the new model differs from other available chemistry model systems applied for the regional scale.

Specific comments:

Page 1534:

Line 2. I find it hard to understand this sentence.

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Line 4. I would recommend you to use "online"/"offline" instead of "on-line"/"off-line". To me the latter seems rather uncommon.

Line 6. Replace "an intense cold frontal passage" with "a cold front passage".

Page 1535:

Line 1. Comment: COSMO is the atmospheric prediction model whereas the climate version is called COSMO-CLM.

Line 9. Please be more specific. E.g., what models use this approach?

Line 17. Remove "easily".

Line 28-. This sentence is long and difficult to understand.

Line 23. Replace subsubmodel by submodel and explain what is meant by a submodel.

Line 24. Is this really the difference between int2lm and int2cosmo?

Page 1536.

Line 10. When no comma is used before i.e. or e.g., please replace "i.e."(e.g.) with "i.e.," (e.g.,)

Page 1538.

Line 15. What do you mean by "one-time"?

Page 1547.

Line 26-. Replace "that it is possible. . ." by "that the MECO(2) system is applicable to different meteorological situations."

Page 1550.

Line 25. Why do you think that the online simulation underestimated the precipitation?