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Geoscientific
Model Development
Discussions

Interactive comment on "A quasi chemistry-transport model mode for EMAC" *by* R. Deckert et al.

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Dear Dr Lauer

thanks a lot for your review and we are glad you find the manuscript suitable for publication after minor revisions. Would you please see below how we have incorporated your comments into the manuscript.

With kind regards, Rudolf Deckert (on behalf of all Co-Authors)

1. p. 2190, l. 6: I suppose by "the signal follows" you mean "the signal is calculated from"? I also recommend replacing "reference and sensitivity" by "a reference and a sensitivity simulation".

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Thanks for these suggestions which we have incorporated.

2. p. 2190, l. 7-8: "...as a substitute of the feedbacks between chemistry and dynamics:" This is of course not true as the offline fields simply replace the online fields, which in turn might cause feedback between chemistry and dynamics. Please consider a more precise formulation.

Good point and something that requires discussions among the authors. Some of the co-authors have not yet come back from vacation and I'm going to be unavailable until January 18th. I would be great if you were so kind to accept a delayed answer.

3. p. 2190, l. 14: "...from a non-QCTM simulation of the reference setup." This sounds odd. I recommend to replace "of" by, for instance, "using" and "reference setup" by "setup of the reference simulation".

Done, thanks.

4. p. 2190, l. 17-18: "...prescription of water vapor tendencies." Do you mean chemical water vapor tendencies? If so, please say so.

We meant chemical water vapor tendencies indeed. The text is changed accordingly.

5. p. 2192, l. 9-10: What do you mean by "...breaking the feedback between chemistry and dynamics"? Turning chemistry-dynamics feedbacks off?

We have amended the relevant text passage: "... turning chemistry-dynamics feedbacks off".

6. p. 2192, l. 12: Replace "discrepancy" with "difference".

Done.

7. p. 2194, l. 1-3: What do you mean by "two blocks in North-South direction"? I suppose you mean two blocks at the same longitude and the same latitude, with one block being in the Northern and the other in the Southern Hemisphere? Please clarify.

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Good point and we have modified the relevant sentence into: "For each variable in Gaussian representation two blocks at the same longitude and the same latitude are combined, with one block being in the Northern and one block in the Southern hemisphere".

p. 2196, l. 8: The namelist switch L_COUPLE_H2O appears to be a variable of the kind logical. The value "2" seems therefore out of place and is inconsistent with its value given in Table A1.

You are right of course and we have replaced "2" by "F".

9. p. 2200, Section 4: I am missing a brief summary of the model setup. This description should at least include horizontal model resolution, number of vertical levels, chemistry mechanism, nudging data, simulated time period, and a list of submodels used.

We have moved the setup description from the caption of Fig. 3 to Section 4 and added some information: "The setup for the simulations is T42L90MA with EVAL chemistry (Jöckel et al., 2006), and includes the submodels CLOUD, CONVECT, CVTRANS, DRYDEP, H2O, HETCHEM, JVAL, LNOX, MECCA1, OFFLEM, ONLEM, PSC, QBO, RAD4ALL, SCAV, TNUDGE, and TROPOP. There is no nudging of the dynamical variables. The model setup is for conditions of the year 2000 and we analyze the seventh month, July, after initialization. This implies non-equilibrium conditions, but is sufficient for demonstration purposes".

10. p. 2200, l. 13: To my knowledge, the word "percental" is written without a hyphen. I would also recommend to simply use e.g. "relative difference" instead.

Thanks and we have replaced all instances of "percental difference" into "relative difference".

11. p. 2203, l. 3, 15, 21: References to Figure 7 should be Figure 6.

Right, thanks.

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12. p. 2212, caption of Table A1, "EMAC version 1.11": Do you mean "EMAC version 1.10"? If not, please update the manuscript accordingly.

We had used EMAC version 1.10 for the evaluation simulations, but the QCTM was released in version 1.11. The relevant text passage in the introduction is now: "This documentation presents a QCTM implemented into the CCM ECHAM/MESSy Atmospheric Chemistry (EMAC), version 1.10. It has been released in version 1.11.".

13. p. 2212, caption of Table A1, "...triggering as the timed import". Do you mean "triggered"?

We have amended this passage: "Regridding is referred to as spatial interpolation of an offline field to the ECHAM5 Gaussian grid (see Jöckel, 2006). Triggering is referred to as the timed import of the regridded field into a running simulation (see Kerkweg et al., 2006)".

14. p. 2215, caption of Figure 3: The information on the model setup should rather be given in Section 4 and removed from the figure caption.

Done. Would you please see the answer to your comment 9.

15. p. 2215, 2216, Figures 3 and 4: I ïňĄnd the labeling of the contour lines confusing. Do they have to be multiplied by the number given in brackets above the plots? Please give the contour lines simply in %.

Would you please find the now less puzzling Figures 3 and 4 in the revised manuscript.

16. p. 2217, caption of Figure 5: What do you mean by "mean annual-mean"? Zonally averaged annual mean? Please clarify.

Thanks and we have modified this text passage into "Zonally averaged annual-mean temperature ...".

17. p. 2217, 2218, Figures 5a and 6a: The labels of the contour lines are overlapping in a way that makes them illegible. Please consider optimizing the figures in this respect.

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Good point and would you please find the redone Figures 5a and 6a in the revised manuscript.

18. p. 2218, 2219: The captions of Figures 6 and 7 are mixed up.

Thanks a lot as the mixed-up captions would have confused the interested reader considerably.

Please also note the supplement to this comment:
http://www.geosci-model-dev-discuss.net/3/C657/2011/gmdd-3-C657-2011-supplement.pdf

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Interactive comment on Geosci. Model Dev. Discuss., 3, 2189, 2010.