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**Geoscientific
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Discussions**

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

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General comments

The authors present a method to use the chemistry climate model EMAC in a chemistry-transport mode without having to change or recompile the source code. They also provide an example for the application of this new mode as well as a comparison with the fully coupled mode of EMAC. The detailed description is well suited to allow other users of EMAC to use the model system in quasi chemistry-transport mode.

The manuscript is written well and clearly. I suggest publishing in *Geoscientific Model Development* after addressing the minor comments and suggestions given

below.

Specific comments

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".
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.
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".
4. p. 2190, l. 17-18: "...prescription of water vapor tendencies." Do you mean chemical water vapor tendencies? If so, please say so.
5. p. 2192, l. 9-10: What do you mean by "...breaking the feedback between chemistry and dynamics"? Turning chemistry-dynamics feedbacks off?
6. p. 2192, l. 12: Replace "discrepancy" with "difference".
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.

8. 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.

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.

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.

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

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.

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

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.

15. p. 2215, 2216, Figures 3 and 4: I find 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 %.

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

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.

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