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Interactive comment on "ECHMERIT V1.0 – a new global fully coupled mercury-chemistry and transport model" *by* G. Jung et al.

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The public discussion of this paper has ended, and I encourage submission of a revised manuscript. In addition to the comments made by the anonymous reviewers, I suggest to take the following considerations into account:

General comments:

- The authors show how they have implemented MECCA chemistry into the ECHAM5 model. Such an implementation (of the same models) has also been done previously by Jöckel et al. (ACP, 6, 5067-5104, 2006). Thus, the additional mercury reactions could also have been added to that model code. However, if there were specific reasons for a new implementation, they could be briefly

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mentioned in the text.

- On page 397 it is mentioned that oxidized products have the same Henry's law constant as HgO. However, I cannot find any information about the value that was used for HgO.

Technical comments:

- In the abstract, ozone and mercury "concentrations" are given in the units "ppb" and "ppq". This is problematic for two reasons:
  - The physical properties "mixing ratio" and "concentration" are used as if they were identical. This is not the case! (for details, see http://www.mpch-mainz.mpg.de/~sander/res/vol1kg.pdf) Please check all occurences of the word "concentration" in the text and check if it should be "mixing ratio" instead.
  - According to the IUPAC Recommendations (Schwartz & Warneck "Units for use in atmospheric chemistry", Pure & Appl. Chem., 67(8/9), 1377-1406, 1995) the usage of "ppb", "ppt", and "ppq" is discouraged for several reasons. Instead, "nmol/mol", "pmol/mol", and "fmol/mol" should be used for gas-phase mole fractions.
- Instead of putting the chemistry mechanisms into an appendix, I think that publishing them as an electronic supplement (maybe together with the kpp equation file) would be more suitable.
- In the list of references, check the author names of Damian et al. carefully.
- SO_3^- on page 397 is most probably incorrect.
- Page 399, line 26: Move the opening bracket to the number 1997.

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- On page 404, change “ECHMA5” to “ECHAM5”.
- On page 407, change “ration” to “ratios”.
- On page 420, change “Guede” to “Guide”.
- Top panel of Fig. 16: It is obvious that the model is faster when running on more than 1 CPU. I think it would be more useful to show the scaling factor, i.e. instead of plotting T_x/T_1 I suggest to plot $(N_{CPU} \times T_x)/T_1$.

Interactive comment on Geosci. Model Dev. Discuss., 2, 385, 2009.