Atmos. Chem. Phys. Discuss., 7, S60–S62, 2007
www.atmos-chem-phys-discuss.net/7/S60/2007/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Simulating organic species with the global atmospheric chemistry general circulation model ECHAM5/MESSy1: a comparison of model results with observations" *by* A. Pozzer et al.

Anonymous Referee #3

Received and published: 24 January 2007

General comments

Overall this is a useful paper on the evaluation of model performance for organic species both in describing this model's results and presenting an approach which could be applied to other models. It is particularly important as few studies on model evaluation for hydrocarbons have been published.

Specific comments

Section 1

There needs to be more discussion of previous model evaluation studies in the introduction especially any connected with validation for hydrocarbons.

Section 2.1

Please add some more description of how detailed the atmospheric chemistry used was. How many NMHHCs are included in the scheme and how detailed is the stratospheric chemistry (constrained top boundary condition, Cariolle type parameterization or a full stratospheric chemistry).

Where is the model top?

Section 2.2

Is it appropriate to treat the variance of the observations as an "error"? Surely it is a physical part of the system which a model should be able to reproduce? (At least for station data with frequent enough observations). A high variance in ozone for instance might be caused by short period of ozone episodes which are a key feature to reproduce. Please explain this method more and justify its use. If it can be justified, more discussion of the difference between weighted and unweighted model results would be useful. This seems to indicate 2 important issues a) a simple correlation with the results gives a overly pessimistic view of model performance b) there is an issue with the amount of observations available.

Please give more information on how the model was sampled. In particular was the model level for comparison with data at the stations sampled at the model level appropriate to the height of the station and was the model only sampled at the times/days when observations were made or was a simple monthly mean of the model field sampled?

Section 5.1

The authors make the statement that there is an improvement compared to other models but do not justify with references or quantify this statement in any way.

ACPD

7, S60–S62, 2007

Section 6

Please give more information on the sources of isoprene data.

Section 8

Is the very localised increase in CO due to the previously discussed failure of the convection scheme to transport species sufficiently from the surface? If the CO were lifted to higher altitudes transport would be more rapid and the response to increased emissions would be over a larger area.

Section 9

It is worth highlighting the improvement for CMDL data by sampling upwind of the observations at certain locations in the conclusions.

Technical corrections

Tables - all footnotes seem to have disappeared since the previous draft. This is particularly important where these state the units. (tables 2 and 4)

Section 6 - "this seemed to be a particular year" should be "this seemed to be an unusual year"

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 127, 2007.