Geoscientific
Model Development
Discussions

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Interactive comment on "The Chemistry Climate Model ECHAM6.3-HAM2.3-MOZ1.0" *by* Martin G. Schultz et al.

Anonymous Referee #3

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Schulz et al. present a thorough description and evaluation of the gas-phase chemistry in the latest version of the ECHAM-HAMMOZ chemistry climate model. The manuscript is very well written and includes ample description of the model and simulations (leaving room for the other manuscripts to be published). My only major comment is the focus on a single year for the model evaluation for most of the quantities. Although the analysis is very well done, in order to fully evaluate a chemistry climate model, I'd think it would be necessary to evaluate it beyond a single year of a nudged run – i.e., ~10 year climatology from a free-running simulation. I understand that a single year using nudged fields makes the comparison easy and straightforward, but any sense of stability and interannual variability is lost. That said, I think the manuscript should be published with minor revision.

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Specific comments:

Page 14, lines 5-24: Some parts of the discussion of the IASI instrument are probably excessive for this paper, however, it would help to talk more about how the comparison to the model was made.

Page 15, line 28: May be useful here to reiterate that the model temperatures are nudged.

Page 16, line 5 and elsewhere: stating "however, a close examination..." - where possible it would be helpful to just have a 3rd column/row that shows (model minus observed) so that the differences can clearly be seen.

Page 17, line 5: Is this comparison for the full 10-year simulation or only with 2008 - ?

Page 18, lines 2-4: How does the sensitivity no_het_HNO3 compare for other metrics (e.g., ozone burden, methane lifetime, etc.)? What might be a way of fixing this - Possible that the uptake coefficient is too high?

Page 22, lines 15-16: Which grid cells?

Page 23, line 3-4: Is it possible the differences could also be due to inaccurate emission data, as in Sect 5.5?

Page 29, line 3: What is resp.?

Page 30, line 2, values "of" Textor et al. (2006)

Table 5: seems to be a mistake with the reported ozone lifetime values (24.1 days for reference and both LNOx sensitivity runs)

Interactive comment on Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2017-191, 2017.

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