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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Improved simulation of isoprene oxidation chemistry with the ECHAM5/MESSy chemistry-climate model: lessons from the GABRIEL airborne field campaign" *by* T. M. Butler et al.

Anonymous Referee #1

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The authors use a 3-D global model to explore issues related to OH and isoprene model / measurement discrepancies during the GABRIEL field campaign. This is certainly a fascinating (and important!) current issue. Two main avenues are explored to 'fix' the observed discrepancies - the possible recycling of OH, and the possibility of a lowered effective OH/isoprene rate coefficient due to segregation of the reactants. While the details of the processes responsible for the model/measurement discrepancies of course cannot be determined from this study, I find this to be a useful exercise in that it sets some bounds on the magnitude of the relevant effects, and presents some

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possibilities for future exploration. I have no major problems with the paper. Some minor points that should be addressed are given below.

The work of Thornton et al. (JGR, v. 107, 2002) should be mentioned in the introduction, I think. These workers pointed out the need for OH recycling mechanisms in the isoprene-rich Nashville region.

pg. 6280, and elsewhere: I am not sure that CH3CHO is produced from isoprene?

Pg. 6282, line 15, starting with "Similarly,...", this is not a complete sentence as written.

Pg. 6291, line 18: Do you mean that you correctly simulate the existence of low NOx conditions? (given that simulated isoprene is an order of magnitude low).

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 6273, 2008.