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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Cloud-scale model intercomparison of chemical constituent transport in deep convection" *by* M. C. Barth et al.

Anonymous Referee #1

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Review of: Cloud-scale model intercomparison of chemical constituent transport in deep convection Author(s): M. Barth, and The Intercomparison Participants

General comments: This paper introduces a numerical study of the transport and scavenging of chemical constituents in deep convection using a set of high resolution cloud chemistry models. In that way, the convective transport is explicitly simulated without the need of the traditional cumulus parameterizations which due its own formulation (e.g., trigger functions and closures) impose several uncertainties on the model results. The methodology used consists of an intercomparison of the models performance in describing the multicellular convective system and the 3-d redistribution of several gases (CO, O3, NOx, HNO3, H2O2 and CH2O). The paper is well structured, clear and presents valuable results to be published. I recommend its publication after

the minor points below are addressed.

At conclusions section, the authors should improve the discussion about how this kind of approach can be efficiently used to improve the traditional convective schemes (with or not chemistry) in the large-scale global/regional models.

Page 8044, line 7: Insert a blank space between “finitedifference”

Page 8048, line 2: MPDATA needs a reference.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 8035, 2007.