Atmos. Chem. Phys. Discuss., 9, S716–S717, 2009
www.atmos-chem-phys-discuss.net/9/S716/2009/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "The impact of tropical recirculation on polar composition" *by* S. E. Strahan et al.

Anonymous Referee #2

Received and published: 10 March 2009

The authors have done an excellent job of discussing modal age, mean age, and age spectrum in the context of evaluating transport pathways in CTMs and CCMs. They highlight that just getting mean age correct "is necessary, but not sufficient". They discuss the importance of deriving an age spectra and point out that the "separation of the mean and modal ages reflects the degree of horizontal mixing (recirculation)". The main point to take away for this work is the importance of diagnosing the tropical ascent rate, tropical circulation, and vortex barrier strength [in models] in order to evaluate processes that determine lower stratosphere polar composition. The authors clearly showed this by using the GMI model with two very different age spectra. This work is clearly written and should be published as is.

I have two minor comment that I hope the authors will follow up on.

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

1) Early in the paper the author discuss the importance of getting total inorganic chlorine correct (page 1099; discussion of the Waugh et al., 2007 paper and in the statement on page 1109 that mentioned the "relevance of evaluating tropical transport processes in models when polar behavior is the issue of interest". To this end, it would be nice to show [in this paper or in later work] some comparison of total inorganic chlorine abundances connected with these two GMI models simulations. One gets the sense that the GMI-DAS better represents observed transport pathways (except for the "leaky vortex"); does this model also better represent polar chemistry too? If not, why?

2) Is the main reason that the authors see more tropical recirculation in the GMI-DAS simulation simply due to the DAS meteorological field having a implicit QBO forcing where the GMI-CCM does not?

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 1097, 2009.

ACPD

9, S716–S717, 2009

Interactive Comment