

Interactive comment on “The roles of convection, extratropical mixing, and in-situ freeze-drying in the tropical tropopause layer” by W. G. Read et al.

W. G. Read et al.

Received and published: 25 April 2008

Thank you for taking time to review our manuscript. Here are our responses to specific comments. Reviewers comments in *italics*

p3963, L5: Gettelman et al 2002 should be cited here. This was the first trajectory based model.

Will do

p3964, L 10: Gettelman et al 2004 -> Gettelman and Webster 2005.

Will correct

p3965, L18: Gettelman et al 2002 show dehydration with increased temperature variance.

I will add this fact.

p3967, L1: what is d ? It is not used in eq 1 or after?

a typo should be τ_d

p3968, L15: This sedimentation was used by Gettelman et al 2002.

I will add reference

p3977, L13: Can the vertical an horizontal averaging kernel of ACE-FTS really see strong variability in HDO which might be due to convection? Or by necessity is it going to average out profiles which in-situ instruments do not?

Yes, horizontal and vertical averaging as well as having to reject cloud contaminated data will prevent IR remote sensors such as ACE-FTS from seeing the strong variability caused by convective processes that are better observed from in situ observations.

p3978, L1: Awkward (and misspelled). How about: "...convection does not sediment all its ice, but some evaporates, consistent with the Keith (2000)..."

Thanks for the rewording suggestion.

p3981, L24-27: This sentence is unclear and confusing. Please reword.

I will do. I think I may add a figure showing the time series of the cold trap temperature that will make the point clearer.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 3961, 2008.

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