

## ***Interactive comment on “Transport of short-lived species into the Tropical Tropopause Layer” by M. J. Ashfold et al.***

### **Anonymous Referee #1**

Received and published: 29 January 2012

Review of Ashfold et al

This paper analyzes back trajectories in the Asia - Pacific region to understand transport into the tropical tropopause layer. The manuscript is generally well written. It does need some clarification and minor revisions before it is publishable in ACP: there are some figures that are not properly explained and documented in their captions, and there are some ambiguities with the analysis and references that need to be cleared up as detailed below.

Specific comments:

P445, L24: There is earlier work on vertical transport of tracers in models. See Lawrence, Mark G., Philip J. Rasch, 2005: Tracer Transport in Deep Convective Up-

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drafts: Plume Ensemble versus Bulk Formulations. J. Atmos. Sci., 62, 2880–2894.

P446, L7: This is misleading: Heyes et al use winds from a model that includes a convective parameterization: the large scale fields have convection implicit in them. Please rephrase.

P447, L15: All of these aircraft reach to 19km or so

P449, L3: Is that a problem with the model PBL scheme? What moves air in the free troposphere from 4km → 12 km? Only convective entrainment would.

P454, L3: How do you get 10K trajectories from 342 sample locations?

P454, L8: Which panel of figure 8 for clarity...

P466, Fig 2: Needs a color scale (frequency?) Is this a linear or log density/frequency scale for the joint PDF?

P472: Fig 6: same issue as figure 2, needs a color scale.

P476, Fig 10: What would a perfect correlation look like here?

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 441, 2012.

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