

Interactive comment on “Stratospheric intrusions induced by a Rossby Wave breaking and its interaction with the subtropical jet during PICO3 campaign” by A. Carré et al.

Anonymous Referee #1

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General Comments

My general impression of this paper is that it does not further our current understanding of stratosphere-to-troposphere transport. While it does utilize a new dataset it only shows that tropopause folds and filaments exist in the mid- and upper troposphere of the subtropics and are irreversible, a phenomenon that has been clearly demonstrated in several studies [Scott et al, 2001; Baray et al 2003; Waugh and Funatsu, 2003 (this paper was not referenced, it focuses on the tropics but the same STT mechanisms apply to the subtropics), Scott and Camas, 2002 (this paper should have been refer-

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enced)]. Nor does the paper demonstrate new analytical techniques.

Whereas previous studies have generally relied on serendipitous ozone measurements such as routine ozonesondes at Hawaii [Waugh and Funatsu, 2003] or MOZAIC flights [Scott et al 2001; Baray et al 2003] to demonstrate the existence of intrusions and filaments in the tropics and sub-tropics, the present study used data from an aircraft campaign that specifically targeted these features. I was hoping that the analysis of this unique dataset would: 1) Shed new light on how the subtropical intrusions differ from their mid-latitude counterparts. For example, do subtropical intrusions lead to more STT of ozone than at mid-latitudes? 2) Provide enough data to verify some type of STT ozone budget for the sub-tropics.

Unless these two aspects can be addressed the paper in its present form provides no real benefit to the scientific community. The dataset could contain a lot of potential, but for the time being it may be best to reject the paper and then have the authors conduct a new analysis for re-submission.

Waugh, D. W., and B. M. Funatsu, Intrusions into the tropical upper troposphere: Three-dimensional structure and accompanying ozone and OLR distributions, *J. Atmos. Sci.*, 60, 637-653, 2003.

Scott RK, Cammas JP, Wave breaking and mixing at the subtropical tropopause *JOURNAL OF THE ATMOSPHERIC SCIENCES* 59 (15): 2347-2361 AUG 2002

Specific Comments

Most of the figures are too small to be clearly understood, especially the fonts and the wind barbs.

This paper needs a separate Method section that describes all of the measurements and models. In the current form the methodology is spread throughout the paper and is confusing.

How is the stratospheric ozone initialized in MESO-NH? What are the boundary condi-

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tions for MESO-NH?

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 10301, 2005.

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