

Interactive comment on
**“Stratosphere-troposphere exchange in a
summertime extratropical low: analysis” by
J. Brioude et al.**

Anonymous Referee #2

Received and published: 17 January 2006

This work presents a case study of the STE within a summertime low. Two MOZAIC flights provide in situ measurements within the mesoscale system. Back trajectories and RDF analysis are used to diagnose the exchange using model analyses. Many case studies of cyclone related STE have been presented in the past, but emphasis has typically been on wintertime systems. The authors claim that this is the first to examine a summertime system. Overall, the study is relatively complete but a few major and minor points should be addressed before publication.

Major Issues:

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The authors imply that the tropopause demarcation is the 2 PVU surface. How sensitive are the results to other values that could be used? In a case study such as this it might be more appropriate to use a layer (such as 2 to 3.5 PVU or similar) to designate the tropopause. A parcel must then cross the complete layer to be considered STE. Not much indication is given in this work about how much the PV changes other than the parcels that decrease from anything greater than 2 PVU to much less.

It is claimed that this work is important since it examines a summertime case. However, a direct comparison of how this case is similar to or differs from wintertime case studies should be discussed.

Minor Issues:

P12467, L5: "...apparently..." Was the Assessment uncertain or the authors of this work?

P12467, L11-12: "...inferred input term..." It is usually only inferred in tropospheric models. Many STE and budget studies have been done with stratospheric models and now combined models are becoming more prevalent.

Section 2.1: The lengthy presentation of the "synoptic situation" is almost de rigueur for these case studies. While obviously a description of the event is needed, there is much that is not needed in the context of this work. For instance, such extensive descriptions of the cloud structures are not required to obtain the results presented. Much of that is easily seen in the figures.

P12471, L18: It would be much easier for the reader if the airpath was also shown on at least one of the panels of figure 2.

P12475, L26-28: Is it possible that the high ozone measurements might be of tropospheric origin?

Figures:

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Many of the figures are hard to read due to their size. In particular, figures 1 and 7 would benefit from a slight size increase.

I found myself wanting to compare figure 1 with figure 2a but they are not at the same time. Is the NCEP analysis available at 17 July 12:00 UTC? That should be used in figure 1b for this comparison. This is also much closer to the time of the MOZAIC flight as shown in Figure 5.

Figure 3: Please indicate the overrunning dry air is shown within the green dashed line.

Figure 5: Caption should indicate that the flight time progresses from right to left.

Figure 6: Please label axes.

Figure 7: Once again could benefit from increased size. It is impossible to read the color bar labels.

Technical Issues:

Some grammar and spelling need to be addressed. A few examples are given below.

P12466, L17: prevents to identify -> prevents identification

P12466, L23-26+: This sentence is very cumbersome.

P12467, L7: od -> of

P12468, L9-10: This sentence isn't needed. It sounds like it was accidentally left from a previous version!

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 12465, 2005.

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