

***Interactive comment on* “Evidence for long-lived polar vortex air in the mid-latitude summer stratosphere from in situ laser diode CH₄ and H₂O measurements” by G. Durry and A. Hauchecorne**

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Reply to referee #2:

We wrote a revised version of the paper taking into account comments of the 2 referees. Please find below our answers to your comments.

- The wording was expanded when discussing the altitude region where the vortex remnants are likely to be detected (Page 8). The difference in the tracer behaviours in the low- and mid- stratosphere was underlined.

- Yes, there is much more mixing in MIMOSA, and probably also in the true atmosphere,

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at lower levels. MIMOSA maps at 450 K and below do not show any evidence of vortex remnants due to this strong mixing. This point is now made on page 8 but we don't think that this map is needed on the paper.

- We do not have carried further simulations in year 2001 to 2004 to search for possible vortex remnants in the summer stratosphere because we do not have SDLA measurements at the right place and time for this period. We just have at our disposal mid-latitude CH₄ and H₂O data yielded in spring or autumn. We believe that running this type of simulations without measurements to support our conclusions is poorly convincing. It is the reason why we have not addressed the issue of inter-annual variability in this paper.

- Corrections in Fig. 3 and 4, as mentioned by both referees were made.

- We have stressed out that the MIMOSA model is run independently on the various isentropic levels (Page 6) and a reference is made to the pioneering works of Orsolini (1995) and Newman (1996).

- A reference to the work of Konopka et al., 2003, is made when discussing the investigation of ozone chemistry inside the vortex remnants (Page 8).

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 1241, 2005.

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