

Interactive comment on “On the observation of mesospheric air inside the arctic stratospheric polar vortex in early 2003” by A. Engel et al.

Anonymous Referee #2

Received and published: 27 September 2005

The manuscript by Engel et al. presents ample evidence for the occurrence of mesospheric airmasses in the stratospheric polar vortex in early 2003. Various tracers measured during three individual balloon soundings in January and March 2003 indicate the presence of mesospheric air at altitudes between 22 and 30 km. Back-trajectory calculations and a run of the KASIMA model support the interpretation of the measurements. The paper is scientific sound, well written and should be published after some minor revisions:

On page 7464 the authors mention that the TRIPLE payload includes a H₂O instrument. Is the H₂ enhancement observed by BONBON accompanied by a simultaneous decrease in water vapour? Since H₂O destruction in the mesosphere is the source of

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the H₂ increase, such an anticorrelation would further support the data interpretation.

The authors calculate the amount of mesospheric air in the stratosphere from the measured CO₂ and SF₆ profiles, using the KASIMA model results for the initialisation in the mesosphere. But the KASIMA model itself could also provide an estimate of the amount of mesospheric air. What is the amount of mesospheric air at 20-30 km that KASIMA predicts for March 6 and how do these numbers compare to those in Fig.11?

Minor point:

In Figure 5 a legend of the colour code would be helpful.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 7457, 2005.

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