

***Interactive comment on “Balloon-borne  
radiometer measurement of Northern Hemisphere  
mid-latitude stratospheric  
HNO<sub>3</sub> profiles spanning 12 years” by M. Toohey et al.***

**M. Toohey et al.**

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**We thank the reviewers for their helpful comments on our paper. In the following, the reviewer’s comments are repeated in italics, followed by our responses.**

***3-1: In my opinion the inclusion of the MANTRA***

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***CFC-11 and CFC-12 retrievals is not well motivated...***

**A similar observation was made by Referee 2. While we choose to retain the retrieved CFCs as part of Fig. (5), we aim to stress that they are retrieved not so much for their scientific value, but as interfering species in our retrieval. The CFCs are now introduced as "interfering species" in Sec. 4.3, and discussed as such in Sec. 6.**

***3-2: I am confused by the statement on pg. 11570, lines 14-16: "These low altitude scans provide the most information regarding the instrument parameters, since they contain significant radiance contributions from HNO<sub>3</sub>, CFC-11, and CFC-12."***

**Section 4.3 has been reworked. A better description of the retrieval algorithm includes a**

clearer explanation of the use of the low altitude scans for the first optimization iteration.

***3-3: On pg. 11576, lines 6-8, the authors use their results to infer that the precision of the ACE HNO<sub>3</sub> measurements is high. I guess that an ACE HNO<sub>3</sub> validation paper has not yet been submitted, but surely there is another reference to support this statement; if nothing else, at least the Boone et al. [2005] paper could be cited here.***

Indeed, the ACE random errors on HNO<sub>3</sub> are typically between 1-5%. We have included this information, along with a reference to Boone et al. (2005) which describes the estimation of the random spectroscopic fitting errors estimated for the ACE retrievals.

***3-4: This is an extremely minor comment, but to me the conclusion section would read better if***

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***sentences 2 and 3 were swapped; that is, make the general statement about where/when the data were obtained before stating that they agree well with ACE data at a similar season/location.***

**We agree with this comment, and have swapped the order of these two sentences in the conclusions.**

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 11561, 2007.

ACPD

7, S6267–S6270, 2007

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