

## ***Interactive comment on “Trends and variability of midlatitude stratospheric water vapour deduced from the re-evaluated Boulder balloon series and HALOE” by M. Scherer et al.***

### **Anonymous Referee #2**

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Review of "Trends and variability of midlatitude stratospheric water vapour deduced from the re-evaluated Boulder balloon series and HALOE", by Scherer et al.

General Comments.

This paper re-analyzes the NOAA Frostpoint humidity record with (a) a corrected record (b) more complete data and (c) detailed comparisons to HALOE with some simple models. The paper is well written, and should be acceptable for publication in ACP with minor revisions. I have two general comments and some minor specific concerns.

First, it would be better for the trend analyses to use a vertical weighting function from

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HALOE in Figures which compare to HALOE. Does this matter? (If not just state it, don't need to show it).

Second, I gather that co-location was done in time and latitude but not longitude. If this is not correct please clarify. Would co-location in longitude and latitude matter? You do not comment at all on this issue. Can you just filter some of the HALOE data to coincidences over Boulder within a certain longitude and latitude? Does this affect the trend at all? I did not see any comments on this in the paper (it seemed to suggest data were shifted in longitude).

Specific Comments:

Pg 14514, L18: What causes the 0.5K uncertainty?

P14515, L6: I think a sentence or two summarizing the reason for the corrections and their magnitude would be useful here.

P14519, L5: State here that all the data from 380-640K is done by altitude separately. It's not immediately clear here until looking at the figures. Also see comment on vertical sampling from HALOE. At least show HALOE Levels on figs 3-5 so the resolution is clear.

P14519, L20: can you indicate the goodness of fit any better in the figures (to show that the proxies do not help at higher altitude).

P14521, L26: Does your model assume jumps? or new trends? How do you know it is a 'drop' rather than a trend reversal. Another sentence or two would help.

P14524, L 27: What is a 'systematic trend bias' of 2K/decade? That the trend should be that much larger or smaller? This does not seem to make sense to me. Please rephrase.

P14525, L5: Is there enough tropical GPS temp data for 10 years (97-2007) to take a stab at this using the GPS temperatures? This should not have a residual trend.

Maybe not.

P14527: Appendix A: I would just fold this into the text. It is not too long and clearly describes the correction and points.

P14541, Caption Fig 8: Replace '...shows a the model...' in 3rd line of caption.

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 14511, 2007.

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