

Interactive comment on “Intercomparison of stratospheric temperature profiles from a ground-based microwave radiometer with other techniques” by Francisco Navas-Guzmán et al.

Anonymous Referee #1

Received and published: 27 June 2017

review uploaded as a supplement

Please also note the supplement to this comment:

<https://www.atmos-chem-phys-discuss.net/acp-2017-346/acp-2017-346-RC1-supplement.pdf>

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-346>, 2017.

Printer-friendly version

Discussion paper



This manuscript shows some very nice measurements of temperatures in the stratosphere. The measurements compare well with various other sources. While I have several suggestions, I have no major recommendations for changes. My most serious complaint is that, while many of the authors of this manuscript speak excellent English, much of the text is very poorly written. I certainly do not think that it should be the reviewer's role to assist in this task, especially when several of the co-authors are completely capable of doing so.

Below are a series of specific suggested changes:

Page 5 - "Radiosondes reach an altitude of 35km". This, and later statements, gives the impression that all radiosondes from Payerne reach precisely this altitude, but I am skeptical that this is the case.

Figure 3 – Given that, according to Figure 4d, the measurement response falls to well below 50% at ~17km, and that, as far as I have been able to determine, other TEMPERA studies show sensitivity only up to at best ~7km, suggesting that TEMPERA measures into the upper troposphere is very deceptive. It does certainly not, as the text suggests "cover the full troposphere and stratosphere".

Figure 4b – This Figure is a simplification of a very similar Figure 14 in Stähli et al. (2013). In that figure it is stated that "In the center of the lines we use all channels and on the wings of the line we use a binning of 3 channels for data reduction". I am almost certain that this is why the middle channels are noisier, and that this has nothing to do with the Zeeman effect, as is stated in the paper.

Figure 4c – What is meant by "observation error"? Given that there are systematic changes >2K in the dataset, I assume that this must be some kind of random error estimate. If this is the case please label it as such. How is it calculated?

Figure 6 – Given the very large discrepancy between the MLS and other measurements on 4 February above 35km, this clearly warrants some discussion. It is very troubling that neither the LIDAR nor the MWR show the decrease in temperature above 35km. Do nearby (in time and space) MLS profiles show the same structure? Do the authors think that this is a bad MLS profile?

Page 9 – "The measurements presented in the plot show the importance of continuous observations for a fixed location, since the variability of atmospheric parameters such as temperature evinces the necessity of measurements with good temporal resolution." This suggests that there are temperature variations every few hours (a conclusion that can certainly not be reached by looking at Figure 5). If this is the case, please show such. If not, then certainly daily satellite measurements must be adequate, and this statement should be removed.

Page 11 – It is stated that, above 35km the RS profiles were extrapolated using TEMPERA profiles. But the top altitude of RS profiles varies, so exactly what does this mean? Were only RS profiles which reached 35km included. If there was data above this was it included (instead of using the TEMPERA data)?

Figures 7, 9, and 12 – The most piece of information on these is the comparison between TEMPERA and the convolved retrievals from the other instruments. Since this is the case, it would be best to plot the

Fig. 1.