

Atmos. Meas. Tech. Discuss., author comment AC1
<https://doi.org/10.5194/amt-2021-344-AC1>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Reply on RC1

Witali Krochin et al.

Author comment on "Continuous temperature soundings at the stratosphere and lower mesosphere with a ground-based radiometer considering the Zeeman effect" by Witali Krochin et al., Atmos. Meas. Tech. Discuss.,
<https://doi.org/10.5194/amt-2021-344-AC1>, 2022

We thank the reviewer for his constructive and positive assessment of our submitted manuscript. We revised the paper according to both reviewer suggestions and provide a tracked changes version.

General Reply:

The largest deviations between the TEMPERA instrument and both models occur at altitudes, where we either already have a very low measurement response (below 0.6) or during extreme dynamical events such as sudden stratospheric warming. The benefit of the local observations is that these capture more details of dynamical features and how the event evolves compared to a global data assimilation, which usually builds on sparse observational data for altitudes above 35 km.

The revised manuscript now also includes plots, where we compare retrievals with Zeeman effect turned off, which further underlines the improvement of the revised temperature retrieval algorithm. We also want to note that Figure 5 shows a comparison of the retrieved temperature with the apriori. We clarified in the description that the large difference in this Figure that at altitudes with a good measurement response our retrieved temperatures do not depend on apriori knowledge and the solver converges to an atmospheric state, which might be far away from the initial condition.

Comment:

I think the paper would benefit from copy editing, mostly regarding grammar, punctuation, or the use of hyphens, and some mis-spellings. I do not provide a list for all that, as I am not a native speaker myself.

Reply:

The manuscript will undergo language editing.