

Atmos. Meas. Tech. Discuss., referee comment RC3
<https://doi.org/10.5194/amt-2022-313-RC3>, 2023
© Author(s) 2023. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on amt-2022-313

Anonymous Referee #3

Referee comment on "Updated merged SAGE-CCI-OMPS+ dataset for the evaluation of ozone trends in the stratosphere" by Viktoria F. Sofieva et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2022-313-RC3>, 2023

The SAGE – CCI – OMPS data set is one of several important merged satellite data sets that have contributed to our understanding of ozone variability and trends in recent decades. The current paper describes improvements to the dataset made to create the new SAGE – CCI – OMPS+ data set, including new versions of existing data products as well as new instruments contributing to the data set. This straightforward paper is well-written, and AMT readership will appreciate the clear documentation of changes made since the previous version of the data. I have no major comments, but have a list of suggested changes and grammar revisions to improve the clarity of the manuscript.

Page 3, line 11 – “ozone profiles datasets” -> “ozone profile datasets”

Table 1: I suggest including a column with the reference to the appropriate instrument paper for the version of the data you are using for each instrument. Also, can you please check the vertical resolution numbers here? Saying these instruments have ~1 km vertical resolution seems awfully optimistic. Just because the vertical retrieval grid is at 1 km doesn't mean the vertical resolution is, as I'm sure the authors are aware. For example, I believe the OMPS vertical resolution should be more like 2-3 km, not ~1 km.

Page 3, line 16: I was originally confused by why you were mentioning both the UBr and USask retrievals. The reasoning for this is made clear later in the paper (i.e., that they have slightly different coverage that you are trying to exploit). In this section, it might be nice to have a sentence listing the new data sets you are using, and mentioning why you are adding a second OMPS data set.

Page 3, Table 1: Put a comma after Ubr v 3.3

Page 4, line 9 – Fix parentheses on Boone reference

Page 6, lines 14-16: You state the systematic uncertainty below 20 km and above 50 km here – what about 20 – 50 km?

Page 8, eq 1: Is there a motivation for expressing anomalies as a fraction rather than absolute values (i.e., why divide by ρ_m)? Can you briefly comment/justify this choice?

Page 8, lines 20-24: These two sentences are confusing. Is the second sentence referring to the new SAGE – CCI – OMPS+ data set, and saying you are doing something different than the original SAGE-CCI-OMPS data set (as described in the first sentence)? If so, you could start the sentence with something like “In SAGE-CCI-OMPS+, ...”

Page 9, line 6: “ACE-FTC” -> “ACE-FTS”

Page 9, line 6 (and elsewhere): Why do you refer to version 4.1/4.2 of the ACE-FTS data? Shouldn't it be one or the other?

Page 12, Figure 5: Panel a has a different x-axis, please make x-axes the same in this figure.

Page 13, line 23: Drifts and steps are very different to me. Can you point more specifically to where possible steps occur.

Fig. S3 caption: “NLS” -> “MLS”

Figs S5-S6: I think this is UBr OMPS. Please specify in captions.

Page 17, line 6: A colon is more appropriate here than a comma.

Page 18, line 3: “...only the data, which...” -? “... only data that ...”

Page 18, line 7: "As mentioned above..." – I don't see where it was mentioned that you exclude UBr data 14 – 16 km and 20S-20N. But maybe I'm missing something. Although you do identify UBr as problematic in this region, I think this is the first explicit mention that you are not using data in that region. Also, when I came to this sentence I began to question both the choice of masking region as well as the entire motivation for using UBr at all. It seems like the main motivation for using UBr is to get the additional data in the tropics that USask doesn't have, but then you say you are not actually using it here. Also, is the exact choice of masking really sufficient? It would be pretty easy to answer this by showing a latitude-altitude plot of the trend in the difference between UBr and USask. This would much more clearly help justify (or not) the choice of what levels and altitudes to remove from the analysis.

Page 23, line 17: What about the negative trends in the LS. It looks like some of those are significant, and that there are maybe a few more grid boxes that are significant in the new data set in comparison to the previous data set?