

This manuscript provides a comprehensive overview of the validation of OMPS LP v2.6 ozone profiles, discussing biases with comparative observations and the long-term stability of the SNPP dataset. This work is an extension and integration of the Kramarova et al. 2024 study, which presented the OMPS LP v2.6 retrieval. The paper is well-written and well-structured, presenting the results of the validation in a clear way. Particularly interesting is the focus provided in several parts of the paper on finding a valuable set of correlative data to be used for validation, in a future with fewer limb observations available.

I have a few minor comments to the manuscript, which are listed below and a few technical corrections.

- The methodology used to compare OMPS LP with ozonesonde is unclear. It seems that you haven't used averaging kernels to match the vertical resolution of the two profiles (as done with OMPS NP), is this right? In that case how have you performed the interpolation/smoothing of the sonde profiles? Some more details in this regard are needed.
- I would also suggest to include a couple of more references in the introduction, as only the WMO assessment (2022) is used. For example, other comprehensive studies on stratospheric trends and uncertainties are the LOTUS assessment in 2019 and Godin-Beekmann et al. 2022. A recent study involving observations and models on lower stratospheric trends is the paper by Benito-Barca et al. 2025.
- Section 2 focuses briefly on the instrument and on the retrieval, introducing the two versions v2.5 and 2.5. For this reason, I would add "and retrieval description" to the title of the section. It is also not clear from the first paragraph that you are going to use only SNPP in this paper. In the second paragraph, would it be possible to distinguish between the improvements in L1 data and the changes in the retrieval settings between v2.5 and v2.6?
- The authors provide an insight into the approaching future, with MLS and SAGE III retiring soon. At the same time, new OMPS instruments are going to be launched. In this perspective, an overview of other instruments that are going to be designed or launched in the next years would be interesting. For example, you could mention the upcoming ALTIUS mission in the introduction or in the conclusions: for this mission, OMPS will serve as a reference, making it even more important to characterize its long-term stability and biases.
- Since you mentioned in Sect. 5.1 a comparison of the correlation results with v2.5, you could also provide a short comparison between the biases found in version v2.5 w.r.t. v2.6. I am also wondering what is the difference between panel (c) of Fig. 4 to panel (a) of Kramarova 2024. Is it only the considered period? The biases appear smaller and more negative in this manuscript. To help visualize the biases, I suggest reducing the color bar extension for the first three panels of Fig. 4, e.g. to  $\pm 30\%$ .
- Can you shortly clarify the drift computation methodology? Are you computing differences for each collocation OMPS to correlative profiles, then averaging these differences on a monthly basis, removing the seasonal cycle and finally computing the linear trend? Regarding the drift, I think it would be valuable information to include an estimation of the threshold needed to confidently detect trends in the stratosphere over the last two decades, as they are often on the order of 1-2 % per decade.
- For the comparison in polar regions, can you mention if you used a filter for polar mesospheric clouds? Have you considered any restrictions related to potential vorticity to exclude cases with collocations within/outside the polar vortex?

#### **Technical corrections**

L20: I would remove "the" from "the retrieval algorithm".

L30: Also here I would remove "the" from "the OMPS LP".

L41-43: Possible re-formulation of the sentence: “These increases are consistent with model simulation showing that they arise from a combination of ozone-depleting substances concentrations and decreasing upper-stratospheric temperatures, driven by increasing CO<sub>2</sub>”.

L48: “and so trends have large uncertainties” → “leading to large uncertainties in trends”.

L61: I would remove “when validating such data”

L85: “which is more pronounced” → “which was more pronounced”.

L101: Possibly mention also that the altitude range over which ozonesondes can be used for validation is limited to about 30 km.

L112: Is the period until April 2024 or June? For lidar December 2024 is mentioned.

L130: “with which to compare with” → “to use for the comparison with”

L152: Since the v6 became recently available and you also mention it, I would avoid saying “the latest version”.

L175-177: I find the two sentences in these two lines very similar: isn’t the accuracy estimated by the comparison with other data sets?

L216: It is Fig. 4 not 1.

L257: The sentence is not very clear to me. Could it be that the variability of OMPS retrievals at the ozone peak is lower than for the other datasets?

L338: I think you mean between 20 and 30 km.

L379: I would add “above 20 km” at the end of the sentence.

L425: Maybe repeat the word between to make it less confusing: “and between OMPS LP and ozonesondes”.

L484: Typo in OMPS NP.

L615: Remove , after “consistent”.

## References

Benito-Barca, Samuel, et al. "Recent lower stratospheric ozone trends in CCMI-2022 models: Role of natural variability and transport." *Journal of Geophysical Research: Atmospheres* 130.9 (2025): e2024JD042412.

Godin-Beekmann, Sophie, et al. "Updated trends of the stratospheric ozone vertical distribution in the 60° S–60° N latitude range based on the LOTUS regression model." *Atmospheric Chemistry and Physics Discussions* 2022 (2022): 1-28.

Petropavlovskikh, Irina, et al. "SPARC/IO3C/GAW report on Long-term Ozone Trends and Uncertainties in the Stratosphere." 26 Feb. 2019.