We thank Owen Cooper for the time he spent reviewing the manuscript and for the constructive comments. We revised the manuscript in light of the TOAR II Guidelines, in terms of color codes, statistical practices and units. We address his specific comments below (blue text).

General comments:

In the introduction it would be helpful to cite some of the key papers from the first phase of TOAR as they are highly relevant to the background information on the importance of ozone for health, vegetation and climate: Fleming and Doherty et al. (2018), Mills et al. (2018), Gaudel et al. (2018).

Thanks for pointing this out, Fleming et al. (2018) and Mills et al. (2018) have been added as well in the introduction.

Line 152

Regarding the impact of the COVID economic downturn on tropospheric ozone, there is now a large body of evidence that there was a widespread decrease of ozone in the free troposphere, and also at rural surface sites, of northern mid-latitudes. In addition to the papers already cited in this paper, you can also include: Miyazaki et al., 2021 (who show ozone decreases observed by the CrIS satellite instrument); Chang et al., 2022 show decreases above Europe; Putero et al. 2023, show ozone decreases at high elevation sites (a TOAR-II paper); see also Elshorbany et al., 2024 (a TOAR-II paper).

Thanks for these references, we expanded the paragraph to include these works.

It would be helpful to compare your findings to those of other papers in the TOAR-II Community Special Issue. In particular, two papers discuss satellite-detected ozone trends: Pope et al., 2023 and Froidevaux et al., 2025.

If the comment is related to Sect. 6 and TrOC trends, we shortly summarized the suggested findings there.

Line 209

The authors make very good use of the HEGIFTOM database, which is a major achievement of the TOAR-II effort. However, there are two key time series in the HEGIFOTM database that were not used, and I recommend that they be included. As shown by Chang et al. (2024), recently published in the TOAR-II Community Special Issue, highly accurate quantification of free tropospheric ozone above a given location requires 15-20 profiles per month. There are only two locations in the world where ozone is profiled at such a high frequency. 1) Since 1994, the IAGOS commercial aircraft program has profiled the atmosphere above Frankfurt, Germany multiple times per day, and therefore this location has the most accurate monthly mean ozone profiles (see Figure 1, below). The data are so frequent that they can be matched to the overpass times of the satellite instruments. While the profiles only extend from the surface to 12 km, this covers the full depth of the troposphere for most of the year (winter, spring and autumn). 2) The JPL Table Mountain lidar (north of Los Angeles) has been sampling at the rate of 20 times per month since 2018. As the lidar has to operate under clear-sky conditions, it is an ideal match for UV satellite instruments. As shown in Figure 2, the lidar shows a drop in ozone in 2020, so it is an excellent time series for evaluating the impact of the COVID-19 economic downturn.

Thank you for suggesting these ideas. However, we did not implement them in the present work for the reasons explained below. First, the focus of this manuscript is to inter-compare satellite datasets, not to perform a validation of them: the ground-based observations are for this work a reference for the comparison, especially in terms of long-term drift. Secondly, using the Table Mountain Lidar would be useful for our manuscript only to further investigate the COVID-related drop. We did not expand further on this topic as it is not the main focus of the paper, we just wanted to mention how the different data sets show this drop. In this regard, one of the reviewers suggested the need to narrow the focus of the investigation without branching out too much in side topics and Supplementary information. Third, we had a look at the IAGOS data, for example for Frankfurt, and it is indeed an interesting high sampled data set, but it rarely reaches up to the thermal tropopause height, also during winter months. A direct comparison of the IAGOS data set with the monthly satellite data would require some adjustment of the used satellite datasets with the help of ERA5 (or other reanalysis data) to bridge the gap between the monthly averaged TPH and IAGOS top altitude. This procedure goes also beyond the scope of this manuscript and we think it would introduce more discussion on the proper methodology (i.e., the quality of this adjustment) rather than provide a better information on the quality of the satellite data.

Following the TOAR-II Recommendations for Statistical Analyses, all trends need to be reported with their 95% confidence intervals and p-values. In the current draft, Figure 8, Figure 10 and Figure S10, Figure S12 and Figure S15 do not report p-values, and they need to be added.
Thanks for this point, we removed the "statistical significant" expression, adapting the terminology as recommended in the Guidelines, and included the p-values in the pictures and Table 2.

Specific comments
Line 92
Here the period for the SCIA+OMPS product is listed as 2002-3023, but in Table 1 it is listed as 2004-2023. Why the discrepancy?
Thanks, the discrepancy was corrected.

Line 109
Figure 1: It's worth pointing out that the only place where all products seem to agree well is northern mid-latitudes (40-60 N) in summer. Do you have an explanation? Why is there no comparison for the 20-40 N latitude band?
We changed the plot to adapt the latitude bands to the TOAR II recommendations. We mention the agreement at northern mid-latitudes in the description of Fig.1.

Line 120
It's not clear how the data sets were de-biased. Please explain.
Thanks, this is now better explained in the manuscript. The de-biasing simply consists in the removal of the offset between the specific satellite product and the multi-instrumental mean.

Figure 4 and Figure S3
Please check the labels on the x-axis. OMI-MLS has been previously reported as showing a drop in ozone in 2020, but these figures show the drop occurred in 2021. Also, the time series in these plots seems to start in January 2006, when the OMI-MLS data go back to late 2004. Something seems to be off.
Thank you, we have checked and the time lines are consistent. The drop is not particularly visible in OMI-MLS in 2020 because the anomalies are computed over the entire time period. As shown in Fig. S3 when the anomalies are computed over the 2016-2019 period, the drop becomes more evident also in 2020 and in other data sets. The plot was updated with start date in 2004 instead of 2006.

Line 251
A paper submitted to the TOAR-II Community Special Issue (Lu et al., 2024) quantifies ozone trends across East and Southeast Asia using ozonesondes and IAGOS data, and they found increases above both regions.
Thanks, we included this in Sect. 6 and in the references.