

The authors are grateful for the reviewers' additional suggestions for minor revisions, fine-tuning the quality of the manuscript. All comments have been addressed below, and modifications have been made accordingly.

Reviewer 1

Keppens et al. responded to the reviewer comments. All points raised in the first report were addressed. This includes both general and main comments as well as the minor/specific comments. Most of the reviewers' suggestions were adopted and incorporated into the manuscript. Where the authors had other suggestions, these were appropriately justified and explained.

In view of the authors' response and the changes made to the manuscript, it can be published in AMT. Nevertheless, I suggest that a few minor, mostly technical/editorial, comments might be considered for the final submission.

General Comment:

The others opted for BE. Hence, I recommend to do this consistently. Some examples for still existing inconsistencies are: summarizes -> summarises, or, Sun-normalized -> Sun-normalised and similar words. Although there will be a thorough language editing by AMT, I suggest already now to be consistent throughout the manuscript.

Author reply: The authors apologise to have missed some AE notations in the manuscript, having checked for "harmonization" only. The authors have now revisited and corrected the entire manuscript text for BE spelling. Also see detailed comments below.

Minor/specific and technical comments:

Page 5, lines 88 and 92: Sun-normalized -> Sun-normalised

Author reply: This suggestion has been adopted.

Page 5, line 91: I am still puzzled by the tropospheric ozone concentration of 10^{12} molecules per cubic meter. I still think this value is much too low and should read molecules per cubic centimetre, see also Siddans (2003) and Munro et al. (1998). Please cross check again.

Author reply: Thanks for being persistent in this matter, and apologies for the misconception. This value must be 10^{12} molecules per cubic cm indeed and has been updated accordingly.

Page 6, line 147: deseasonalized -> deseasonalised

Author reply: This suggestion has been adopted.

Page 16, line 419 and at other places in the manuscript: summarizes -> summarises

Author reply: This suggestion has been adopted for the two occurrences of "summarises". Additionally, "minimizes" in line 620 has been changed into "minimises".

Page 19, line 526: (Figure 8, left)

Author reply: Thanks for having spotted this typo. This suggestion has been adopted.

References:

Munro, R., Siddans, R., Reburn, W. J., and Kerridge, B. J.: Direct measurement of tropospheric ozone distributions from space, *Nature*, 392, 168 171, <https://doi.org/10.1038/32392>, 1998.

Siddans, R.: Height Resolved Ozone Retrievals from GOME, PhD Thesis, University of Reading, Reading, 2003.

Reviewer 2

The authors have revised the manuscript according to the reviewers' comments. I recommend publication after dealing with the following remaining issues:

Section 2.1: Several products are mentioned here without reference. The authors write in their reply that the references are given later; however, they should be given at first instance in the text.

Author reply: Following the reviewer's request, references to Miles et al. (2015), Keppens et al. (2024), Hurtmans et al. (2012), and Cuesta et al. (2013) have been introduced in Section 2.1 already, preceding the respective dedicated subsections.

Table 1: "Sampling resolution": Please add a footnote or explanation elsewhere that in some cases the original satellite measurements have a different (higher) spatial resolution, and that a down-sampling was applied within the profile retrievals.

Author reply: Thanks for pointing at this distinction. The authors have added the following to the table caption: "Note that the fourth column provides the sampling resolution of the products as input to this work, while the native sampling resolution of the instruments is usually higher."

Concerning the role/independence of CAMS:

Comment: CAMS is used as transfer standard. However, this is not an independent dataset, as the satellite measurements are used during assimilation. This aspect has to be discussed. Please also state whether all or only a subset of the presented data sets are included in CAMS assimilation.

Author reply: None of the ozone profile or tropospheric ozone column products discussed in this work are assimilated in CAMS. Therefore "not involving any of the retrieval products discussed in this work" has been added to Section 2.4.

This is valuable added information. But still, CAMS involves (other) O₃ products from satellite measurements, doesn't it? So, these are likely correlated to (and not completely independent from) the products discussed in this study. This should at least be mentioned.

Author reply: The note that had been introduced between brackets before has been removed and replaced by the following more complete phrasing: "Although the assimilated ozone data does not involve any of the retrieval products discussed in this work, it should be noted that some of the assimilated total ozone column data originates from the same instruments. It is here assumed that this results in negligible data correlations only, as column and profile retrievals originate from different parts of the observed spectra."

SMOD: I still do not understand the first row in Fig. 3. The model yields an O₃ column that is fixed (the model output itself does not depend on the AK). So, what "difference" is exactly shown here, and what does it mean?

Author reply: The text on Delta SMOD that was already there has been extended with a clarification on the vertical smoothing error with reference to Rodgers (2000): "The first row (Delta SMOD) shows the difference between the CAMSRA model data x_m (black dashed lines) before and after averaging

kernel smoothing. The latter is given by $x_m' = A x_m + (I - A) x_a$ (Keppens et al., 2019) and the difference $x_m - x_m'$ hence captures the retrieval's vertical smoothing error as estimated by the model (Rodgers, 2000). As a function of time, this difference Delta SMOD then shows to what extent temporal changes in the averaging kernels (and thus retrieval sensitivity) affect the product time series (Pope et al., 2024)."

Additional changes (some of these were not automatically tracked and hence highlighted in the track changes version of the manuscript):

Update on fourth affiliation acronym to "SPASCIA, Ramonville-Saint-Agne, France."

Page 6, line 125: In the meantime, the paper by Boynard et al. (2025) has been accepted. Its reference has been updated accordingly, using <https://doi.org/10.5194/acp-25-11719-2025>.

Page 6, line 139: The title of section 2.1.5 has been changed into "DLR UV-visible merge" to align with the other subsection titles of this section.

Page 6, line 141: In the meantime, the GOP-ECV paper has been accepted (Coldewey-Egbers et al., 2025). Its reference has been updated accordingly, using <https://doi.org/10.5194/amt-2024-196>.

The IASI CDR data availability statements and acknowledgements have been updated in agreement with recent DOI registration for the data and corresponding references: (1) Clerbaux, C. and Coheur, P.-F.: Daily IASI/Metop-A ULB-LATMOS ozone (O3) L2 product (vertical profile and columns – EUMETSAT processing) [data set], <https://doi.org/10.25326/806>, 2025a. (2) Clerbaux, C. and Coheur, P.-F.: Daily IASI/Metop-B ULB-LATMOS ozone (O3) L2 product (vertical profile and columns – EUMETSAT processing) [data set], <https://doi.org/10.25326/807>, 2025b. (3) AC SAF: IASI Ozone (O3) Climate Data Record (CDR) Release 1 – Metop-A and -B, EUMETSAT SAF on Atmospheric Composition Monitoring [data set], https://doi.org/10.15770/EUM_SAF_AC_0051, 2025.

"Figure" instead of "Fig." has been consistently used throughout the text.