

July 16, 2025

Comments by Owen R. Cooper (TOAR Scientific Coordinator of the Community Special Issue) on:

Harmonisation of sixteen tropospheric ozone satellite data records

Arno Keppens, Daan Hubert, José Granville, Oindrila Nath, Jean-Christopher Lambert, Catherine Wespes, Pierre-François Coheur, Cathy Clerbaux, Anne Boynard, Richard Siddans, Barry Latter, Brian Kerridge, Serena Di Pede, Pepijn Veefkind, Juan Cuesta, Gaelle Dufour, Klaus-Peter Heue, Melanie Coldewey-Egbers, Diego Loyola, Andrea Orfanoz-Cheuquelaf, Swathi Maratt Satheesan, Kai-Uwe Eichmann, Alexei Rozanov, Viktoria F. Sofieva, Jerald R. Ziemke, Antje Inness, Roeland Van Malderen, and Lars Hoffmann

EGUsphere [preprint], <https://doi.org/10.5194/egusphere-2024-3746>, 2025.

Discussion started Jan. 31, 2025

Discussion closes July, 2025 (extended)

This review is by Owen Cooper, TOAR Scientific Coordinator of the TOAR-II Community Special Issue. I, or a member of the TOAR-II Steering Committee, will post comments on all papers submitted to the TOAR-II Community Special Issue, which is an inter-journal special issue accommodating submissions to six Copernicus journals: ACP (lead journal), AMT, GMD, ESSD, ASCMO and BG. The primary purpose of these reviews is to identify any discrepancies across the TOAR-II submissions, and to allow the author teams time to address the discrepancies. Additional comments may be included with the reviews. While O. Cooper and members of the TOAR Steering Committee may post open comments on papers submitted to the TOAR-II Community Special Issue, they are not involved with the decision to accept or reject a paper for publication, which is entirely handled by the journal's editorial team.

Comments regarding TOAR-II guidelines:

TOAR-II has produced two guidance documents to help authors develop their manuscripts so that results can be consistently compared across the wide range of studies that will be written for the TOAR-II Community Special Issue. Both guidance documents can be found on the TOAR-II webpage:

<https://igacproject.org/activities/TOAR/TOAR-II>

The TOAR-II Community Special Issue Guidelines: In the spirit of collaboration and to allow TOAR-II findings to be directly comparable across publications, the TOAR-II Steering Committee has issued this set of guidelines regarding style, units, plotting scales, regional and tropospheric column comparisons, and tropopause definitions.

The TOAR-II Recommendations for Statistical Analyses: The aim of this guidance note is to provide recommendations on best statistical practices and to ensure consistent communication of statistical analysis and associated uncertainty across TOAR publications. The scope includes approaches for reporting trends, a discussion of strengths and weaknesses of commonly used techniques, and calibrated language for the communication of uncertainty. Table 3 of the TOAR-II statistical guidelines provides calibrated language for describing trends and uncertainty, similar to the approach of IPCC,

which allows trends to be discussed without having to use the problematic expression, “statistically significant”.

General comments:

Since this paper was submitted to AMT in late 2024, the OMI/MLS product has been updated to take advantage of the new OMI Collection 4 L1b retrievals (Kleipool et al., 2022), which correct for instrument drift through the end of 2024. Will this updated OMI/MLS product be incorporated into your analysis? Does this new version of the OMI dataset impact any of the other products in your analysis?

Two of the panels in Figure 6 and Figure 7 have missing data due to the South Atlantic Anomaly (SAA) (Finlay et al., 2020). While this phenomenon is well known to satellite experts, many general readers are not familiar with the SAA. Please consider adding a brief explanation for the missing data.

References

- Finlay, C.C., Kloss, C., Olsen, N. et al. The CHAOS-7 geomagnetic field model and observed changes in the South Atlantic Anomaly. *Earth Planets Space* 72, 156 (2020). <https://doi.org/10.1186/s40623-020-01252-9>
- Kleipool, Q., N. Rozemeijer, M. van Hoek, J. Leloux, E. Loots, A. Ludewig, E. van der Plas, D. Adrichem, R. Harel, S. Spronk, M. ter Linden, G. Jaross, D. Haffner, P. Veeffkind, and P. F. Levelt, Ozone Monitoring Instrument (OMI) collection 4: establishing a 17-year-long series of detrended level-1b data, *Atmos. Meas. Tech.*, 15, 3527–3553, <https://doi.org/10.5194/amt-15-3527-2022>, 2022.