

Comments by Rodrigo J. Seguel on behalf of the TOAR-II Steering Committee on:

Tropical tropospheric ozone distribution and trends from in situ and satellite data

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This review is by Rodrigo Seguel, member of the TOAR-II Steering Committee. 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 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.

General comments

The authors have assessed the distribution and trends of tropical tropospheric ozone using available ozone profiles measured by a suite of in situ instruments (IAGOS commercial aircraft, the SHADOZ network, and the ATom aircraft campaign) and six satellite records of tropical tropospheric column ozone (TROPOMI, OMI, OMI/MLS, OMPS/MERRA2, CrIS, and IASI/GOME2). The authors have performed a great job of enhancing the trend detectability and comparability of different data sources and also provided a thorough discussion about bias between satellite and in situ data.

In particular, given the sparsity of the in-situ sampling over the tropics (time and space), SHADOZ and IAGOS measurements were fused over some regions to enhance the trend detection, which is based on quantile regression, as suggested by TOAR-II guidelines (TOAR-II Recommendations for Statistical Analysis). Also, the ozone profiles from in situ observations were converted to columns to evaluate the satellite products and adjust the satellite biases, thus allowing the reduction of the satellite differences in the tropical tropospheric ozone burden (TTOB).

Overall, the findings are consistent with the papers from TOAR-I and the papers submitted to the TOAR-II Community Special Issue. In this regard, the low ozone levels found over the Americas are consistent with the relatively low ozone mixing ratios measured at ground level in the South American tropics compared with South American extratropics values reported in: <https://doi.org/10.5194/egusphere-2024-328>

Minor comments

In section 2 (Methods), the authors clearly define the latitudinal band corresponding to the tropics for this study, which also follows the TOAR-II recommendation (TOAR-II Community Special Issue Guidelines). However, in lines 124 and 132, they refer to the

tropics between 30° S and 30° N, which includes the subtropics. For consistency, I suggest changing “tropics” to “tropics and subtropics,” similar to line **101**.

Line 215-2016 (Caption of Figure 1): Please change “Africa, South Asia” to “Western Africa, India”

Line 257: Do you mean the disagreement is within $\pm 2\%$?

Line 283: Please check the parenthesis.

Line 699: Change “cannow” to “can now”

Line 894-896 (Conclusions): In addition to the processes described by Kley et al. (1996), are there any other relevant processes that explain the low ozone values found in the Americas and the tropical South Pacific that may be suitable to discuss?