

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

**Regional and sectoral contributions of NO<sub>x</sub> and reactive carbon emission sources to global trends in tropospheric ozone during the 2000-2018 period**

Aditya Nalam, Aura Lupaşcu, Tabish Ansari, Tim Butler

EGUsphere [preprint], <https://doi.org/10.5194/egusphere-2024-432>

Discussion started: 12 March 2024; Discussion closes April 23, 2024

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.

**General Comments:**

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, tropopause definitions and best statistical practices.

*Guidance note on best statistical for TOAR 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".

I am posting my comments at the very end of the open review period. This paper has already received three thorough reviews from the referees selected by the editors, and I don't have anything substantial to add. My comments are limited to a request that some recent papers, either submitted to the TOAR-II Community Special Issue, or published in the special issue, be cited where appropriate.

Line 51

When mentioning the equatorward shift of ozone precursors you could also cite a new paper recently published in the TOAR-II Community Special Issue (Li et al., 2024), which shows that the equatorward shift is continuing in Asia, according to the latest bottom-up emissions inventories.

Another TOAR-II paper under review is Mertens et al. (2024) and there are some similarities between this paper and yours. It would be helpful to briefly mention this other TOAR-II submission and comment on similarities or any differing conclusions.

Line 40

When referencing the estimated number of deaths due to ozone exposure, the 95% confidence interval (as reported by Malashock et al., 2022) should also be provided.

Tables 3-5

As described in the *Guidance note on best statistical for TOAR analyses*, all trends should be reported with 95% confidence intervals and p-values. The expression “insignificant” should not be used. The reader can tell if a trend value is meaningless based on 95% confidence interval and the p-value.

### **References:**

Li, M., Kurokawa, J., Zhang, Q., Woo, J.-H., Morikawa, T., Chatani, S., Lu, Z., Song, Y., Geng, G., Hu, H., Kim, J., Cooper, O. R., and McDonald, B. C.: MIXv2: a long-term mosaic emission inventory for Asia (2010–2017), *Atmos. Chem. Phys.*, 24, 3925–3952, <https://doi.org/10.5194/acp-24-3925-2024>, 2024.

Mertens, M., Brinkop, S., Graf, P., Grewe, V., Hendricks, J., Jöckel, P., Lanteri, A., Matthes, S., Rieger, V. S., Righi, M., and Thor, R. N.: The contribution of transport emissions to ozone mixing ratios and methane lifetime in 2015 and 2050 in the Shared Socioeconomic Pathways (SSPs), *EGUsphere* [preprint], <https://doi.org/10.5194/egusphere-2024-324>, 2024.