

**Response to the Referees #2-3's comments on "The impact of El Niño–Southern Oscillation on the total column ozone over the Tibetan Plateau"
(egusphere-2023-1452)**

We thank Referees #2-3 for making detailed comments and very useful suggestions to improve the paper. The manuscript has been revised and further improved in response to the referee's comments and suggestions. Below is a point-by-point response (in black) to the comments (in blue) followed by the corresponding changes in the manuscript with track changes (*in italics*).

The line numbers for the changes correspond to the revision.

Response to *Anonymous Referee #2*

General comments

The article "The impact of El Niño–Southern Oscillation on the total column ozone over the Tibetan Plateau" by Yang Li et al. investigates anomalies of total column ozone over the Tibetan Plateau During El Niño and La Niña events. As for the newest revision, I recommend this article for publication after some minor changes (mostly technical).

Most issues have been resolved by the changes and the author's comments. In particular, the revised version has clarified the methodology and the text throughout the article. Furthermore, the revised text reflects the data and derivable results much better than before.

Following are some minor comments that should be addressed before acceptance to ACP.

We thank again for the reviewer's comments and suggestions.

Minor comments

1. Consider adding the discussion of Table A1/B1 and Figure A1/B1 to the Appendix (or at least to the supplement) since it supports your analysis and findings.

Good point. We have added the discussion into *Summary and discussion* of revision [Lines 397–409].

2. I 198: "QBO signal ($TCO_{\text{removeQBO}}$) can be written as follows:" is there a reference for the linear separation of the QBO effect? If so, please add it here.

Yes, we have added the reference (e.g. Randel et al., 2009) into [Lines 198–199].

3. Fig. 6 caption: The difference between “thick green lines” and “green lines” is barely visible. I suggest increasing the width of the thick line. Also consider shrinking the vertical axis in order to enhance visibility of the “shaded area” around the green lines.

Yes. We have increased the width and reduced the vertical axis. Please see the Figure 6 in revision.

Technical comments

1. I 195: “.. another potential important source of interannual variability.” -> “another potential important source of interannual variability of TCO above the TP.”

Rephrased.

2. I 335 “...thickness and thus associated with...”: There is a word missing. E.g., either “are thus associated” or “thus are associated”.

Added.

3. I 379 “...to MAM in decaying phase...”: Either “in its decaying phase” or “in the decaying phase”

Rephrased.

References

Randel, W. J., Garcia, R. R., Calvo, N., and Marsh, D.: ENSO influence on zonal mean temperature and ozone in the tropical lower stratosphere, *Geophys. Res. Lett.*, 36, <https://doi.org/10.1029/2009GL039343>, 2009.