

Co-Editor Decision: Publish subject to technical corrections (17 Apr 2019) by Peter Haynes

Comments to the Author:

All referees are in agreement that your paper is now suitable for publication in ACP. One referee has recommended some technical corrections -- please can you consider these recommended corrections carefully (and perhaps also check the paper more generally) before providing a final version.

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Review of "Influence of ENSO and MJO on the zonal structure of tropical tropopause inversion layer using high-resolution temperature profiles retrieved from COSMIC GPS Radio Occultation" by Noersomadi et al.

The manuscript has improved a lot upon review, the authors have satisfied all of my comments, it reads very well overall with the right amount of detail and discussion in each section. It's a high-quality study and I recommend to publish it after a few very minor technical corrections:

We deeply appreciate the reviewer for accepting the manuscript to be published in ACP. We show below our responses to the individual corrections.

p.8 l.34: 'convective activity resulted in decreased...' --> I suggest a more correct expression 'regions with more frequent convective activity show decreased...' because strictly speaking these are climatologies.

We follow suggestion by the reviewer and revise the statement in P8 L34-35.

p.9 l.25-29: During El Nino events convection moves away from the MC towards the PO region and the eastern Pacific, so it's to be expected that the correlations with the ENSO index will be opposite for MC and PO. The high magnitude of the correlations for PO could be due to the fact that, outside ENSO events, this is a region with very low convective activity, whereas MC is not devoid of convection even during ENSO events

(and MJO can influence the MC region as well in its late phases), meaning more processes will affect OLR and Sab there.

--> I suggest to slightly rephrase this part of the paragraph to include the points from above.

We agree with the reviewer and add the following sentence in P9 L27-30:

The high magnitude of the correlation for PO could be due to the fact that, outside ENSO events, this is a region with very low convective activity, whereas MC is not devoid of convection even during ENSO events (and MJO can influence the MC region as well in its late phases).

p.11 l.5-9: This mechanism can also explain the differences in climatology between MC and PO as well as interannual to intraseasonal variability, since ENSO and MJO modulate convective activity. You test this with Fig. 14.

p.11 l.10-17: you can link your result from Fig. 14 to the modulation of convection by ENSO and MJO from previous sections. It's really worth highlighting that your Fig. 14 kind of summarizes the forcing of tropical TIL variability across time-scales.

We appreciate for suggestions by the reviewer and add the link to Fig.12 and Fig. 10 in P11 L14.

--> Also, I noticed sometimes there's a space and/or capital letter missing when you refer to figures (Fig.X / fig.X --> Fig. X) please check throughout the manuscript for consistency

Thank you very much for your corrections.

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Concluding remarks:

- Refer to the corresponding figure number when you introduce your results.
- Highlight what's new. Generally in the first two paragraphs your results agree very well with previous studies (refer to them as well), while your dataset has improved vertical resolution compared to them (this should be highlighted); and the last two paragraphs show variability in TIL properties (ENSO and MJO) that have not been studied in this detail previously.

We follow suggestions by the reviewer and add the link to figures in P11 L25, L27, L33, L36, and P12 L1, L8, L12.

We add the statements in P11 L27-29:

The results generally agree very well with previous studies (Birner et al., 2002; Grise et al., 2010). Using dataset with improved vertical resolution, we found larger values of N^2 compared to the results by Grise et al (2010) in this study.

We also add the sentence in P12 L9-10:

We showed influence of ENSO and MJO on the variation of TIL that has not been studied previously.

Fig. 8: you may want to check the legend labelling (PO should be solid red)

We have edited the legend of Fig. 8.

Thank you very much again for your very valuable comments and suggestions.