Influence of the Tropical Cyclones on Tropospheric Ozone: Possible Implication
by
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I have already reviewed the first version of the manuscript. The authors have answered to all my concerns and the manuscript definitely has improved. However, I still see several points that could be done. The are listed below:

Major concerns:

1) The English language must considerably be improved. Missing words and grammatical issues are quite frequent in the text. I don't list all of them here, but would strongly recommend that a very careful proof-reading is done. Possibly, such a service is provided by ACP?!

2) The introduction now covers 4 pages, which is rather long. But more important, I even after the revision, I miss a lack of focus. I like the paragraph (L99-121) where tropical cyclones and their impact on stratosphere-troposphere exchange (STE) is discussed. But in the previous pragraphs, the more general discussion could be shortened and be more concise. For example, the connection between severe weather (thunderstorms) and ozone transport is mentioned at several places, which left me a little confused about the overall structure of the introduction. In short, I strongly recommend that the introduction is more strongly streamlined to the topic of the manuscript, i.e., to STE in the tropics and in particular STE associated with tropical cyclones.

3) At several places, the authors write that an air parcel is believed of stratospheric origin. Following the suggestion by referee #1 they calculated back trajectories and argue that they could not capture the event, most likely because of the poor temporal and spatial resolution of the reanalysis data. However, why are the trajectory calculations not based on the WRF simulation, which have a 20-km resolution and certainly are available at higher temporal resolution. The manuscript would really gain a lot if trajectories are used. For instance, they write

> *"This is due to the presence or accumulation of dry air, which is believed to have been originated from the stratosphere." (L226-227)*
>
> *"Thus, in the present study, enhancement in the potential vorticity indicates the presence of stratospheric air in the troposphere." (L324-325)*

It would be possibly to underpin these statements with trajectory calculations based on WRF. If the STE event are still not captured in the calculations, a careful discussion would be necessary. It might be possibly that the ozone transport is strongly connected to convection, which cannot adequately be captured by WRF trajectories. If so, I still expect a more careful analysis than provided now.

4) There are still some aspects which are not discussed carefully enough, or which remain too unspecific. For instance, in the introduction it is still written (L87) STE goes along with a disturbed weather condition. What does 'disturbed' mean, repeating the question from my first review? On P3 follows a discussion about the time scales associated with STE. At the top, a timescale of 3 month is mentioned, then later the slow stratospheric intrusions are discussed, e.g., referring to Bourqui and Trepanier (2010); Skerlak et al. (2014). These studies are actually discussion much shorter time scales,

going along with distinct synoptic- and meso-scale features. Finally, how is the turbulent mixing (P10,L247-253) diagnosed? It is only stated that turbulent mixing takes place below a certain level. But it remains unclear where this conclusion is drawn from. Why is there turbulent mixing? Can it directly be inferred from the figures?

Minor comments:

- L17-18: “Numerical simulation of potential vorticity, vertical velocity and potential temperature,” → Rephrase. You use a NWP model and then get PV, vertical velocity and potential temperature out of this model.

- L22-23: “of enhanced and redistribution of tropospheric ozone during cyclonic storms” → Why 'tropospheric ozone'? I thought that it is about stratospheric ozone intrusions!

- L37-39: “The tropopause is a layer that separates the troposphere and the stratosphere, and plays a key role in controlling the mixing of minor constituents,” → Please rephrase! The statement as it stands is rather obvious. Because the tropopause separates the troposphere and stratosphere, it must necessarily 'control' the exchange.

- L46: “anthropogenic” → What 'antropogenic'? Uncomplete statement.

- L53-54: Holton et al. (1995) discusses more the planetary scale of STE; whereas Stohl et al. (2003) put more focus on the synoptic-scale perspective. The references give the opposite impression.

- L197: “then moved towards the west-northwestwards” →Rephrase!

- P8: Andhra Pradesh, Odisha coast , Gopalpur, Bihar → not everybody is familiar with these geographical locations. Possibly, mark their position in a map.

- L240: “Significant perturbation in the tropopause is observed for both the cyclone cases.” → Possibly, it would be nice to quantify how uncommon the tropopause perturbation actually is. This could be done by comparing the observed tropopause height (temperature) to a climatology of the tropopause height.

- L311: “statically stable to the unstaturated atmosphere.” → Do you mean conditional stability?

- L363: “Perturbation of the tropopause is also noticed” → This conclusion is rather unspecific. Please quantify!