

Response to the editor

Editor comments on Manuscript No egosphere-2023-1371

Spring tropical cyclones modulate near-surface isotopic compositions of atmospheric water vapour at Kathmandu, Nepal by Adhikari et al.

I agree with the referee that the manuscript has significantly improved. However, I have several comments that should be considered before the manuscript can be accepted for publication in ACP.

Response: Many thanks for your constructive comments. Below are our point-to-point responses to the comments. The comments are in black, and our responses are in blue.

Major comment:

My major concern is that the structuring of the result and discussion section is not adequate for ACP yet. I know that you separated the sections due to the comment of one referee. However, the discussion section as it is now is much too long and contains too much that rather belongs to the result section. So either, you go back to what you had before that you combine these sections and call it results and discussion or you move major parts to the result section and shorten the discussion to max. 3 pages.

Response: Thank you for your suggestions. Following a comprehensive review of the manuscript, we have decided to maintain the original structure with "Results and discussion" as a combined section, as initially formatted.

Minor comments and technical corrections:

P5, L99: I am not sure if the correction of “during” to “including” is really correct. Do you evaluate the isotopic composition “during” a pre-monsoon cyclone event or do you have that additionally. In the latter case it would be indeed “including”, in the former however it would be rather “during”. Please clarify and change sentence accordingly.

Response: Since, we evaluate the isotopic composition of atmospheric water vapour during the cyclone events, we replaced “including” by “during” in the revision.

P5, L101: These cyclones did not pass Kathmandu, but how far away where these and what did you see in the measurements? I understood that you saw them in the measurements, so that means you still have remnants or an influence of these cyclones over Kathmandu.

Response: Yes, we saw the influence of these cyclones over Kathmandu by our measurements. To avoid misunderstanding to readers, we deleted this sentence and modified into: “A substantial influence of these cyclone events on the sampling site for several days is apparent in the isotopic composition of atmospheric water vapour, showcasing a marked depletion in comparison to normal days.” We also mentioned in section 3.3 in Line 533 that “Yaas came as close as 330 km to our site, while Tauktae was 1050 km away when it dissipated (Fig. S9).”

P5, L109: Please clarify and change text accordingly over which time period this precipitation amount given is referring to. Is it over one month or one day or per year?

Response: Thank you for your comment. We have now included “average annual precipitation” in the revision.

P6, L112: ranges -> ranging and change “averaged” to “is averaged”.

Response: Correction has been made in the revised manuscript.

P6, L118: Please mention instead of just “study period” explicitly which time period is considered.

Response: We have now included exact date of study period in the manuscript instead of “study period”.

P6, Figure 1: I think this figure could rather be moved to the Appendix.

Response: Following your comment, Figure 1 has been moved to Supplementary material as Figure S1.

P9, Figure 2: Also here, please give the time period over which the accumulated rainfall is given. Additionally in the caption the source of the data should be added.

Response: The time period over which the accumulated rainfall was calculated has been mentioned and the data source has also been included in the caption.

P11, L190-191: GPM appears here twice. I guess once it is obsolete.

Response: We have corrected it.

P11, L191: Add “for” before “latitude”.

Response: Correction has been made in the revision.

P11, L199: Check grammar.

Response: The whole paragraph has been modified to “We further acquired data on outgoing longwave radiation (OLR), zonal and meridional winds, specific humidity, vertical velocity, pressure, vertical distribution of relative humidity and temperature from ERA5 datasets (Herbath et al., 2020). The data has a spatial resolution of 0.25° based on longitude-latitude grids”

P11, L203: of -> for

Response: Correction has been made accordingly.

P13, Figure 3: In the legend spaces between parameter and unit should be added.

Response: Following your suggestions, we have added spaces between parameters and units in all necessary figures in the revised manuscript.

P14, Figure 3 caption, L219: add “as indicated by the color shading”.

Response: Modification has been made.

P14, L220: Rather “average” than “variations”?

Response: In the caption, we have changed “variations” into “averages”.

P14, L223: Add “in isotopic composition” so that it reads “depletion in isotopic composition”.

Response: Modification has been made following your suggestion.

P14, L232: Change “ranges from” to “the range was from”.

Response: Modification has been made following your suggestion.

P14, L235: Add “to” so that it reads “to recover pre-cyclone values”.

Response: Modification has been made

P14, L237: Add “a” so that it reads “a d-excess.....”

Response: We have added “a” before d-excess in the revised version.

P15, L240: Here you refer to Fig. S3, but Fig. S1 and Fig. S2 have not been mentioned yet.

Response: We are extremely sorry for this mistake. We have now mentioned Figure S1 and S2 in the revised manuscript.

P15, L238 ff: Since here and also in Sect. 4 Fig. S3 and S4 are discussed here in detail these should rather appear in this section than in the Appendix.

Response: We agree with the editor. Now Figure S3 and S4 have been moved to section 3.3 in the revised manuscript.

P19, L298: Discussions -> Discussion. As mentioned before this section is much too long for a discussion and the majority of the content rather belongs to the result section.

Response: Following the major comment, we have once again restructured the manuscript, now incorporating both results and discussion within a single section titled "Results and discussion."

P19, L300: back trajectories -> backward trajectories

Response: Change has been made.

P19, L303: I would change here "depletion" to "composition". The depletion is the result of the cyclones, but what you are exploring is the composition.

Response: Following your comment, we have changed "depletion" to "composition" in the revised manuscript.

P20, L318: majority of AS vapour -> not clear, please rephrase

Response: The sentence has been modified to "As cyclone Tauktae approached the continent, the primary moisture to Kathmandu was coming from the Arabian Sea, instead of local origins."

P21, Figure 5 caption: Delete "moisture" and add "along the trajectories" after specific humidity.

Response: Modification has been made accordingly.

P24, Figure 6 caption and text: Units should be given in the following format: g kg⁻¹ (see ACP guidelines).

Response: Correction has been made in all necessary figures in the manuscript.

P25, L400: As mentioned before, since Fig. S3 and S4 seem to play a larger role for your study than just some additional information these should rather appear in the manuscript itself than in the appendix.

Response: As mentioned above, Figure S3 and S4 have been moved to section 3.3 in the revised manuscript

P25, L407: Check reference to the figures. Fig. S5 and S6 show precipitation

Response: Correction has been made.

P27, L446ff: Here your results/discussion are based mostly on Fig. 3 and Fig. 8 is only mentioned once. What is the purpose of Fig. 8? If this figure is not that important it should be moved to the Appendix.

Response: After a thorough revision of the manuscript, we have recognized that Figure 8 holds less significance, whereas Figure S8 is deemed more important. Consequently, we have relocated Figure 8 to the supplementary material, and Figure S8 has been moved to section 3.3 in the revised manuscript.

P34, Figure 10. Also this figure could be rather moved to the Appendix since it is not really discussed/mentioned in the manuscript.

Response: Figure 10 has been moved to supplementary material.

P33, L528ff: This last subsection is quite long and not solely about rainfall. It seems that there is some subsection header missing.

Response: The new subsection has been introduced here as “3.5 Relation with cloud-top temperature and cloud-top pressure”.

P33, L578: Should here the new subsection start? These parts are not about rainfall. Further, what is “CTT” and “CTP”? Abbreviations should be introduced.

Response: We have introduced new sub-section “3.5 Relation with cloud-top temperature and cloud-top pressure” here and abbreviations for CTT and CTP have been introduced.

P38, L619: Not clear, please rephrase what exactly what you mean with “unlike during Yaas”.

Response: Upon careful examination, we have determined that the phrase "unlike during Yaas" can be omitted.

Response to the referee

I thank the authors for considering the comments from the two reviewers. The paper now reads better. Here are some minor technical comments to consider before publication:

Response: We express our sincere gratitude to the reviewers for their insightful feedback, which greatly contributed to the substantial improvement of our manuscript.

- Figure 1: put a big black thick cross (for example) instead of the yellow dot.

Response: Figure 1 has been modified accordingly in the revised manuscript as the new Figure S1 following the editor’s comments.

- Figure 3: make the curve of daily variations (cyan) thicker and in dark blue for example. It's hard to see now. Also, increase the font size of the text "before", "Taufstae"...

Response: We've improved the figure by thickening daily variation curves, changing the color to blue, and increasing the font size for enhanced clarity.

- Could Figures 3 and S7 be merged?

Response: We appreciate the reviewer's suggestion, and after careful consideration, we acknowledge the focus of our manuscript on the isotopic composition of atmospheric water vapor during two spring cyclones. The entirety of our analysis revolves around these cyclone events. Combining both figures into the main body of the manuscript poses a challenge, as it would extend the study period and require the inclusion of additional analysis which is beyond the primary aim of our paper.

Furthermore, we note that Figure S7 is specifically addressed in section 4.2 (section 3.3 in the revised manuscript), where we compare $\delta^{18}\text{O}_v$, δD_v , and $d\text{-excess}_v$ during both cyclone events and normal monsoon onset periods. To maintain the manuscript's primary purpose, we believe it is essential not to merge Figure S7, as its inclusion would divert from the main focus of our research.