

Interactive comment on “Tropical cyclones vertical structure from GNSS radio occultation: an archive covering the period 2001–2018” by Elżbieta Lasota et al.

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>> We would like to thank the anonymous reviewer for the insightful and constructive comments, which helped us to improve our manuscript. We appreciate the valuable comments and try to address the issues raised as best as possible. According to the suggestions, we changed the data set structure. For each yearly folder, we created a set of subfolders with respect to the different ocean basin. However, the archive will be updated when the discussion will be closed so the paper remains consistent with the dataset structure. Each major comment has been carefully considered point by point and responded below.

Major Comments/Suggestions

I have one major comment to the data set. When open the data link, I have found the data set in a specific folder with the name of individual years (2001, 2002,...2018). Some of the data files are having the name like 'NOT_NAMED_2001_2001031S13072.nc' in each folder of individual years. This will create some confusion for the users. It would be useful to provide sub folders with respect to each oceanic basin for each year. I strongly suggest to the authors, please include the subfolders with respect to the different ocean basin and keep the data files with respect to basins. I hope this may not take much time for the authors.

>> Thank you for the suggestion. We changed the data structure and every yearly folder is divided on subfolders related to the ocean basins. Hopefully, it makes the access to the dataset clearer for the users now. However, since a single TC can pass through many ocean basins, we assign every TC to the origin ocean basin, where the corresponding TC has started.

Specific Comments

Page 1 LN 24-25: It would be good to include one sentence related to the cyclone names over different basins. The authors used 'cyclones/storm/hurricanes' several times in the manuscript. It is good to introduce the cyclone names over different basins.

>> We corrected the first sentence and explained the different names of tropical cyclones with respect to the basin of the origin. The first sentence of the introduction is now: "The Tropical Cyclones (TCs), known also as hurricanes in the North Atlantic Ocean and Northeast Pacific, typhoons in the Northwest Pacific and simply as cyclones in the South Pacific and Indian Ocean, are extreme weather events affecting the social lives of many people and the economy of entire countries."

Page 1 LN 36: replace 'Numerical Weather Models (NWP).....' to 'Numerical Weather Prediction (NWP)'

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>> Corrected.

Page 1 LN 36-37: It is good to mention 'name of the oceanic basin'.

>> We added the information, the sentence now reads as "Huang et al. (2005), for the first time, assimilated RO refractivity profiles to forecast the Typhoons Nari in 2001 and Nakri in 2002, which which developed in the North Western Pacific Ocean."

Page 3 LN 98: 'global monthly mean multi-satellite climatologies.....' Is it the authors considered the data from 2001 to 2018? Please mention in the manuscript.

>> Information added. The sentence now reads as "Furthermore, we made use of global monthly mean multi-satellite climatologies processed by the WEGC (based on OPSv5.6 profiles for data betweenin the period 2001- and 2017)."

Page 3 LN 103: 'downloaded from The International....' Change 'The' into 'the'.

>> Corrected.

Page 3 LN 115: change '6hour' to 6-hour.

>> Corrected.

Page 3 LN 125-130: 'seven levels based on the wind speed'...It would be good to include a table regarding the different types of TC intensity along with wind speed.

>> Thank you for the suggestion. We replaced the information in the text with the table qualifying TC intensity based on the wind speed (Figure 1).

Page 4 LN 151-152: 'the minimum central pressure and the maximum sustained wind' Authors can mention here about 'wmo_pres' and 'wmo_wind' which are given in the data archive actually.....

>> We added information rephrasing as "The TC is described by the basin of development, the name of responsible recording WMO agency, the distance of the TC from land, the date, time and coordinates at each 6-hour best track stage, the nature of

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the storm, the storm translation speed, the minimum central pressure and the maximum sustained wind speed provided by the responsible WMO agency and stored in 'wmo_pres' and 'wmo_wind' variables, respectively."

Page 4 LN 167: 'We have collected 48313 co-locations between ROs and TCs from 1570 TCs'. The authors mentioned 1822 TCs in the abstract. Please check it once.

>> Thank you for the remark. The numbers are different because in the abstract we refer to the number of TCs collected from IBTrACS (1822), while 1570 is the number of TCs for which we found at least 1 co-located RO. For 252 TCs we did not find any co-location. This now explain in the manuscript.

Page 5 LN 182: 'developed in the Indian ocean.....' Authors can specify the oceanic basin either it is North or South Indian Ocean...

>> The sentence is now: "... which developed in the South Indian ocean ..."

Page 5 LN 196: 'reference climatology profile....'Is it related to the climatology of the respective TC month?

>> Yes, it is the monthly climatology profile. The sentence is now: "... by subtracting the reference monthly climatology profile in the respective area from the individual profile."

Page 6 LN 225: 'corresponds to an altitude of about 15 km above the mean sea level' check it once.

>> We double checked it. We were wrong, we should have written 'of about 12.5 km above the mean sea level'. We corrected this sentence.

Page 6 LN 246: The authors can include the usefulness of COSMIC-2 RO data, particularly the ability to study the diurnal changes of the temperature during the extreme events such as TCs/volcanic eruptions.

>> Thank you for the suggestion, we added the relevant information: "The GNSS RO

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technique is well established and the RO acquisitions are increasing thanks to the successfully launched COSMIC 2 mission, which will contribute to a better understanding of TCs, provide the necessary information to forecast the TC tracks with high accuracy and enable studying the diurnal changes of temperature during the extreme events.”

Figures: Figure 4: Use different color scale. Values more than 624 becomes white. It is difficult to identify.

»> We removed the very light yellow colour from the colour scale.

Please check figure 5. Temperature and humidity anomalies up to 250 km? Is it really possible? I don't think so. Please correct the scale.

»> Our apologizes, it was a mistake, the values should have been divided by 10. Now, it is corrected (Figure 2).

References: Ravindra Babu, S. and Liou, Y.-A.: Measurement report: Immediate impact of the Taal volcanic eruption on atmospheric temperature observed from COSMIC-2 RO measurements, Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-513>, in review, 2020.

»> This paper refers to volcanic clouds, we prefer to focus on TC. We think that the sentence reported before “The GNSS RO ... enable studying the diurnal changes of temperature during the extreme events.” Is enough to explain the importance of COSMIC-2.

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Table 2. TC intensity based on the Saffir-Simpson Hurricane Wind Scale.

Category	Tropical Depression (TD)	Tropical Storm (TS)	Category 1 (Cat.1)	Category 2 (Cat.2)	Category 3 (Cat. 3)	Category 4 (Cat. 4)	Category 5 (Cat. 5)
1-minute maximum sustained wind speed [$m s^{-1}$]	≤ 17	18-32	33-42	43- 49	50-58	58-70	>70

Fig. 1.

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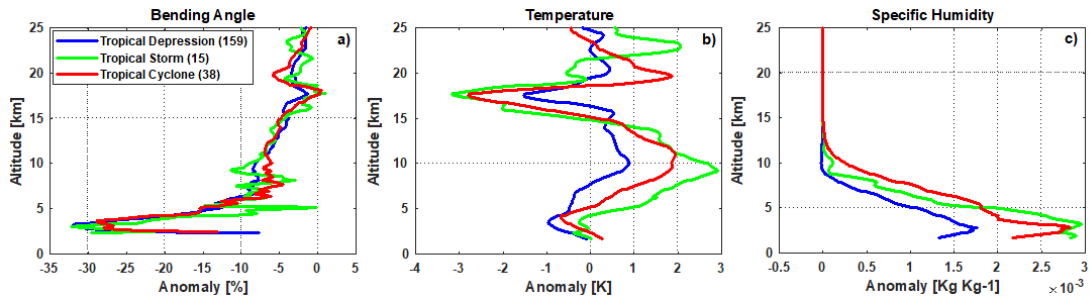


Fig. 2.

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