

Interactive comment on “Asian Summer Monsoon Anticyclone: Trends and Variability” by Ghouse Basha et al.

Anonymous Referee #3

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Review of the study entitled “Asian Summer Monsoon Anticyclone: Trends and Variability” by Ghouse Basha et al.

This is a quite interesting paper related to the Asian summer monsoon anticyclone (ASMA) and the title is adequate. The research topic is of scientific interest and worth to be publishable. The study deals with the temporal, spatial and long term trends in the ASMA by using reanalysis and satellite data sets. The authors investigated the decadal variation of the anticyclone region with respect to 1951-1960 base period. They noticed significant changes over the anticyclone edges. Furthermore, the authors also studied the ASMA variability with respect to the wet and dry spells of the Indian monsoon, strong and weak monsoon years, and the stronger El Nino Southern Oscillation (ENSO) years. Overall, the authors have brought out some significant

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shortcomings from the study. However, I personally think that the paper still needs significant changes before the manuscript is ready for publication. Therefore, I recommend for publication in ACP with revision. I had the chance to read the comments of the Anonymous Reviewer #2 and I do share all his/her general comments. General comments 1. Abstract needs to be improved. I strongly suggest, the authors have to rewrite the entire abstract part and strictly focused on the important results obtained from the study. 2. How authors define the ASMA region? Why GPH values are considered to define the ASMA region? Other methods are also (for example potential vorticity) used by the previous researchers. Authors can stress this point and define their selection of ASMA region from the GPH values in the manuscript. 3. Why authors separated the ASMA into 4 parts? This needs to be discussed properly. 4. Conclusions part looks much generalized. The authors can provide 3 or 4 major results as point by point at the end of the conclusion part. 5. Finally, the presentation quality needs 'strong improvements'.

Specific comments: There are some numbers of language and grammar issues in the present manuscript. However, I do not mention all of them in the present review. The authors should take care of all in the revised version of the manuscript.

Line 7-16: Authors can shift these sentences into the introduction section.

Line 18-19: 'The decadal variability of the anticyclone is very large at the edges of anticyclone than at the core region' rewrite the sentence. . .

Line 20: change into 'to the 1951-1960 period'

Line 22: change 'anticyclone' to 'the anticyclone'

Line 29: '.and during strong La Nina years'. Remove 'during' from the sentence.

Line 30: Unclear——'while interpreting the pollutants/trace gases in the anticyclone' Do you mean changes or variability in the trace gases? Please clarify what is meant here.

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Line 35: 'from Asia to the Middle East'— change it as 'from the Asia to Middle East'.

Line 35: Add 'The' in front of ASMA. . .

Line 89-93: data period '1901-2016/1948-2016'. This needs to be clarified.

Line 94-124: The vertical resolution of GNSS RO data was missed. What is the original resolution of the GNSS RO (CHAMP and COSMIC). Is it originally available at 100/200m or some interpolation is done?

Line 100-101: I doubt about the vertical resolution of 0.5-15 km? Is it correct? Authors can look on it again.

Line 112: 'The CHAMP data was available from 19 May 2001 to.' not required, delete this sentence.

Line 128-130: rewrite the sentence with clarity.

Line 132-134: not clear. . . 'The spatial extent and intensity of anticyclone are greater during July compared to the intensities present during other months'. Rewrite the sentence.

Line 135: Authors can follow any one either 'Asia to the Middle East' or 'Middle East to East Asia' in the entire manuscript. Authors mentioned earlier in Line 35 as 'Asia to the Middle East'.

Line 146: Authors written sometimes as 'anticyclone' sometimes as 'the anticyclone' in the entire manuscript. This needs to be solved in the entire manuscript.

Line 147: rewrite 'During the September month '

Line 150: change 'the core region of anticyclone'. . . . The core region of the anticyclone.

Line 159-173: The authors presented observed changes in the ASMA region during different decades. This paragraph needs some more discussion on the possible reasons for the observed changes.

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Line 174-175: I couldn't find 'Figure 3' in the manuscript.

Line 199-203/Line 263-266: each sentence needs a citation. ...I suggest add some references to the sentences. ...

Line 207-226: The authors can give some scientific explanation on observed warming in the mid troposphere during active days.

Line 253: 'excited'? It means existed? Check it once.

Line 257: This clearly demonstrates that a 'large scale ascent develops over the Asian monsoon region'. Incomplete sentence.

Line 258-259: Unclear. Rewrite the sentence again.

Line 273-274: 'the strongest El Niño (1958, 1966, 1973, 1983, 1988, 1992, 1998, and 2015) and La Niña (1974, 1976, 1989, 1999, 2000, 2008, and 2011) years'. How authors selected these years? The temperature anomalies shown in Figure 8 are from NCEP or GNSS RO? If GNSS RO, how many years considered for obtaining the temperature anomalies?

Line 307: change as 'reanalysis, satellite and observational data'

Line 308: rewrite the sentence

Line 309-310: unclear. 'Spatial (magnitude) of the anticyclone structure'

Line 313: use other suitable word instead of 'present'

Line 339: what is meant 'thermal adaptation' here? Check it once.

Line 341-344: unclear. Rewrite the sentence again.

Line 352-353: incomplete sentence.

Figures:

Figure 3 was missed from the present manuscript.

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Rewrite the title of the Figure 4... '1948-2017' to "1948-2016"....

Figure captions needs to be improved with more clarity.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-668>, 2019.

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