Nonlinear Processes
in Geophysics

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Discussions

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comment

Interactive comment on "Characterization of the South Atlantic Anomaly" *by* K. A. Nasuddin et al.

K. A. Nasuddin et al.

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Response to referee comments

Manuscript title: Characterization of the South Atlantic Anomaly

Authors: Khairul Afifi Nasuddin, Mardina Abdullah, Nurul Shazana Abdul Hamid

We like to thank the referee for their comment. We have read and prepare the respond. The summarization of the respond is explain in this attachment.

Referee comment 2

Since it is long-range correlation analysis, there should be the plots showing how to ïňĄt the scaling exponent, which range has been used. This kind of important ïňĄgures are not given in the manuscript. The conclusions given in this manuscript may be not

believable.

Response: The periodogram figure can be seen in the Results and Discussion section in line 8 page 11 figure 6 for the high latitude region, the periodogram figure for mid latitude region in line 3 page 14 figure 7 and the periodogram for South Atlantic Anomaly region in line 7 page 16 figure 8. The spectral exponent, β for the station in the region can be seen the periodogram figure. An example figure of power spectral density is shown in page 10 line 7 figure 5.

In the Fig. 5, there are changing cycles, which will distort the estimation of spectal exponent\beta, how do you deal with them? This should be explain in the manuscript.

Response: For the 2.4 H-component, the purpose of this section is to explain the selection of the H-component apply in this research compare to other Earth's magnetic field component. An example figure of power spectral density is shown in page 10 line 7 figure 5.

The strength of the Earth's magnetic ïňĄeld inïňĆuences the estimated spectral exponent \beta over different regions and different phases cannot explain all the results given in Tables 3-5, exceptional results for some speciïňĄc stations should be explained.

Response: The explanation have been explain in the conclusion section. It is in line 9 to line 14 page 18.

The data length used in this study. Is there any ïňĄnite effect on the estimated spectral exponent?

Response: The data length is for 1 day which is 24 hour. A comparison is made between data of the H-component for 1 day between the occurrence of geomagnetic storm and when no geomagnetic storm occur. By applying the power spectrum analysis method, the spectral exponent β can be obtained. Thus, the Hurst exponent can be define.

If there are multiple scaling ranges, which one is chosen to ïňĄt estimated spectral exponent? Why?

Response: The method chosen to analyze the South Atlantic Anomaly is power spectrum analysis. Power spectrum analysis is a representation of the magnitud of the various frequency components of a signal. By looking at the spectrum, one can find how much energy or power is contained in the frequency components of the signal. The one scaling range is chosen since the data sample rate is 1 minute.

Please also note the supplement to this comment:
https://www.nonlin-processes-geophys-discuss.net/npg-2018-51/npg-2018-51-AC2-supplement.pdf

Interactive comment on Nonlin. Processes Geophys. Discuss., https://doi.org/10.5194/npg-2018-51, 2018.