

Interactive comment on “Spectral characteristics of high latitude raw 40 MHz cosmic noise signals” by C. M. Hall

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The very specific criticisms of the manuscript are much appreciated; one referee recommends rejection while the other states a potential for publication, and apparently based on the same criticism. Responses to respective comments are as follows.

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Referee#1

Major comments:

1. The rationale for comparing with Gaussian and Cauchy distributions comes from preceding studies of terrestrial and solar phenomena. Lévy flights and walks have

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been demonstrated (albeit arguably) for solar processes including indices designed to quantify auroral activity. The approach was, of course, based on a similar study by the author examining geomagnetic data (considered a more “back-to-basics” observable than the derived and easily downloadable geomagnetic and solar-wind indices). The advice offered by the referee, is, naturally gratefully received.

2. The very reasons for adopting the two potential distributions defended above have origins in the underlying physics, or rather the characteristics of the physics the instrument and the physical processes affecting the cosmic noise signal and its perturbation. So if the author could satisfactorily defend the choice of Cauchy and Gaussian distributions, the connections to physical processes would become clearer.

Minor comments:

The author apologizes for these omissions / inadequacies / inconsistencies, all of which, as the referee says, can be easily corrected.

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Referee#2

Pages 973, 975 and 980. Clearly, the authors has not succeeded in relating the scaling regimes to the potential underlying physics. Both referees identify this weakness in the paper. Hopefully, addressing refere#1’s major points (discussed above) will resolve referee#2’s misgivings for pages 973, 975 and 980.

Page 977. The 1-minute cut-off can be explained in a revision (if appropriate). Fluctuations shorter than 1 minute are not shown in the corresponding figure since they constitute (or rather are deemed to constitute) instrumental noise and detract from the part of the plot considered to be “interesting” (also the figure then exceeded the size acceptable by NPGD).

Page 978. Due to the logarithmic axis, there are so few data points at longer timescales compared to in the vicinity of the chosen high-frequency limit that there is negligible

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difference in the linear fit. The fit is totally dominated by the high density of points at the higher frequencies (the author has tested this on previous occasions when analysing other observables).

Page 979. Hopefully, part of this issue could be resolved by an improved discussion of the potential underlying physical processes as proposed above. In addition, the author accepts that some form of uncertainty should be given for the fitting (also one of Referee#1's minor comments) and this could be provided in any revision. The possibilities for other interpretations can and indeed should be incorporated in the text.

Interactive comment on Nonlin. Processes Geophys. Discuss., 2, 969, 2015.