Nonlin. Processes Geophys. Discuss., 2, C355–C356, 2015
www.nonlin-processes-geophys-discuss.net/2/C355/2015/

Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "Spectral characteristics of high latitude raw 40 MHz cosmic noise signals" *by* C. M. Hall

Anonymous Referee #2

Received and published: 30 August 2015

Summary: The author analyzes cosmic noise from a riometer at Ny-Ålesund (79N, 12E) in Norway. The full riometer signal, which includes the noise source and its absorption by the ionosphere, is analyzed to determine spectral coefficients. The author finds spectral ranges over which different exponents apply.

Overall assessment: The methodology of the paper should be improved (see comment for Pg. 979). However, the author does not motivate the purpose of the analysis or what new scientific information the analysis provides. Rejection of the paper is recommended.

Detailed comments: Pg 973, Line 10: The significance of identifying different exponents is not motivated. What is learned about the physical processes involved? Are the ionospheric processes distinguished from variations in the cosmic source? If not,

what is learned by analyzing the exponents of the combined processes?

Pg. 975, Line 1: The goal of the study is not clear. What is gained by achieving this goal? How does it contribute to scientific understanding of the processes that lead to the data?

Pg. 977, Line 18: I don't see periods less than one minute being analyzed here, only periods longer than one minute. There could a typo in this sentence (< or >).

Pg. 978, Line 23: Could variations of the source (rather than absorption) at periods > 1 hour also contribute to the determination of the scaling exponent?

Pg. 979, Line 8: A methodology issue is as follows: how is it known that a single exponent is the appropriate description of these data? The small uncertainty of the exponent presupposes a single exponent is applicable. What if non-exponential behavior is a valid description of the phenomena, at least over certain ranges? There is no test for the "goodness of fit" of a single spectral exponent, therefore the uncertainty values are under question. There is no underlying theory suggesting a single spectral exponent is the correct functional form here.

Pg. 980, Line 5: These speculations as to causes are best done in reference to the existing literature on these topics, which is rather extensive.

Pg. 980, Line 13: What if multiple processes are operating? Is it possible to connect variations in the data with a single underlying process?

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