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Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "Conjugate fluctuation analysis for a set of 41 magnetic clouds measured by the ACE spacecraft" *by* Ojeda González et al.

Anonymous Referee #2

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The paper presents an analysis of the magnetic field fluctuations using many techniques, with the goal of characterizing persistence. On the whole the results are interesting and contributes significantly to the understanding of the solar wind fluctuations. However there are problems in the paper that should be addressed.

Title: The terms "Conjugate" is neither explained in the paper nor is it a widely used term. The authors should remove this term or explain its implications and importance in detail. The main goal is however the persistence in the fluctuations and thus would be appropriate to include it in the title.

The paper should present the results in the proper context. For example, the power spectral index \beta is a widely used measure of turbulence, and has values close to to 5/3, as in strong MHD turbulence [e. g., Goldreich & Sridhar Ap J, 438, 763, 1995]

and not an appropriate parameter for measuring persistence. Its relation to the other exponents is however interesting. The Detrended fluctuation analysis (DFA) is a widely used technique for nonstationary data but has many limitations, as discussed in a recent review [Bryce and Sprague, Sci Rep., 2:315, 2012]. An analysis of geomagnetic data using DFA shows long-range correlations or persistence [NPG, 18, 719, 2011] which should be related to the results for the solar wind, as in the Tsurutani et al [GRl, 17, 279, 1990]. Further, the relationship of the techniques used here to other techniques such as Rosa et al 1999 and 2008 should be discussed.

The paper has many glitches in the language and needs significant improvements in the text at many places.

Interactive comment on Nonlin. Processes Geophys. Discuss., 1, 583, 2014.