Nonlinear Processes
in Geophysics
Discussions

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 #1

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In this manuscript, the authors have used physical-mathematical approaches to analyze the time series of magnetic field data of 41 magnetic clouds (MCs) and found the persistence exponent values increased inside clouds. They have also obtained a set of threshold values to separate the cloud regions and other solar wind. In my scope, the approach is novel in the analysis of MCs but the results are not significant, because it is well known that the magnetic field rotations are smoother inside the cloud than in the ambient solar wind. Given the extensive mathematics in the analysis, the application of the methods for the identification of MCs seems to be fairly limited.

A few comments:

1. There are many studies of coronal mass ejections (CMEs) in history. The Dasso et al (2005) paper is not the first one defining CMEs. Same problem applies to the

references of CME models in Line 47.

2. The first half of the second paragraph in introduction is redundant with the first paragraph.

3. Page 4, Line 265, should introduce the criterion of selecting 41 of 80 events now rather than in the last section. If you do not count the 7 cloud candidates, how many events would you select? Check if the 41 events are all in Lepping's list (the footnote in Page 7). How would the persistent exponent values change with the quality of the MCs in Lepping's list?

4. Table 1, event 1, the time of after MC should be 9 Jan rather than 10 Jan. Check time for other events.

5. Page 6, line 387, rephrase the sentence "we did not stop to . . ."

6. Introduce Fig 2 earlier because some of the discussion on Fig1 can be seen more clearly in Fig 2.

7. According to the indication of alpha values in Page 3, the MC threshold is 1.392 which means it is like random walk. It seems not be consistent with the expectation of coherent field rotations in MCs? Can you say more about the implication of the threshold values? Are magnetic field in MCs self-affine time series?

8. Page 11, line 637, "a" is missing in the last two expressions.

9. Can you learn anything through the comparison of sheath and post-MC regions?

The authors need to improve English in the manuscript. There are numerous places to fix, for example, post-MC rather than pos-MC, an odd sentence in line 258, past-tense of verbs.

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