Interactive comment on “Turbulent Processes in the Earth’s Magnetotail: Spectral and Statistical Research” by Liudmyla Kozak et al.

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Comments on “Turbulent Processes in the Earth’s Magnetotail: Spectral and Statistical Research” by Kozak et al. The authors used Cluster data to investigate turbulent properties before and during the dipolarization process in the near Earth’s magnetotail. This work is interesting, but more work is needed to do. The comments below are helpful to improve this paper.

Q1. The authors used most of parts to introduce the sub-storm in the magnetotail, but just simply mentioned several works which are related with plasma turbulence in the magnetotail. However, there are a lot of important works which have investigated the turbulent process (such as spectral index, intermittence, multifractal etc.) associated

Q2. Line #23 in Page 3, 3 events cannot cover from 2005 to 2015. After read the paper, one knows two events in 2005, one event in 2015. Thus, I suggest the authors to re-write this sentence to avoid the confusedness.

Q3. Line # 30-32 in Page 3 and Line #1-6 in Page 4, the authors describe three components and depolarization, but they didn’t show any components in Figure 1. As a reader, I strongly suggest the authors present the components of magnetic field.

Q4. Table 1 in Page 5. The authors show the features of the depolarization front. The speed of the DF and thickness are estimated by timing analysis. However, the separation of four Cluster spacecraft is about 2 Re in 2005. This separation is able to compare with the dawn-dusk scale of DF (Fu et al., 2012; Huang et al., 2015), which leads to that the timing results may be not correct. One should be careful to perform timing analysis such situation. Fu, H. S., Y. V. Khotyaintsev, A. Vaivads, M. André, and S.Y. Huang (2012), Electric structure of dipolarization front at sub-proton scale, Geophys. Res. Lett., 39, L06105, doi:10.1029/2012GL051274. Huang, S. Y., et al. (2015) Dawn-dusk scale of dipolarization front in the Earth’s magnetotail: multi-cases study, Astrophys Space Sci, 357, 22, doi:10.1007/s10509-015-2298-3

Q5. Table 3 in Page 8: Kink frequency? I can’t see obvious kinks in the spectrum in Figure 3. Thus, I would like to use the frequency of breakpoint to replace it.

Q6. Line #12 in Page 10: Inverse and direct cascade. What’s inverse and direct cascade? What’s the definition of two cascades? How to identify two different cascades? I think such introduction will make the paper more clearly.

Q7. Line #8 in Page 13: It should be pointed out that spectral properties of the field are not sensitively affected by intermittency. Any references to support this?

Q9. Line #7-8 in Page 3: “This allows one to get an idea of the physical proper-

Q10. I suggest the authors compare their results with previous observations, and dis-cuss them.

Q11. Some typos in the Line #12-13 in Page 1 and line #21-22 in Page 7: —2.20 Å–1.53, —2.89 Å–2.35 in Line #1-2 in Page 18: 0.20 Å 0.77 1.20 Å 1.77 in Line #17-18 in Page 18: -2.20 Å 1.53 2.89 Å 2.35