

Interactive comment on “A new method to identify flux ropes in space plasmas” by Shiyong Huang et al.

Anonymous Referee #2

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Comments on the manuscript entitled “A new method to identify flux ropes in space plasmas” by Huang et al. Magnetic flux ropes have been regarded as an most important byproduct of magnetic field reconnection. They can raise the reconnection rate, generate energetic electrons, and change the magnetic topology. The typical signatures of a magnetic flux rope are a bipolar variation of magnetic field in the normal direction of the current sheet, and a significant enhancement of the core field as well as the total magnetic field strength. Generally, the flux ropes in the magnetopause and the magnetotail can be easily recognized from the spacecraft measurement by eyes. However, it becomes complicated while the flux ropes were located in the magnetosheath where the current distribution was turbulent. In this paper, the authors proposed a new method to identify the flux ropes in both the large-scale current sheet

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and the small-scale current sheet. Furthermore, this method was tested by the Cluster and MMS observations in the magnetosheath and magnetotail. The results indicates that the method can select the flux rope effectually. In my view, the result is new and interesting, and suitable to publish in Ann. Geophys. after the following issues are considered. Line 26 flux ropes → magnetic flux ropes Line 31 Wang et al., PRL 2010 reported the first evidence of magnetic flux rope or island generated during a single X-line, should be cited here. Line 34, Wang et al., Nat. Phys. 2016 shows a clear picture of the dissipation role that the magnetic flux ropes play on. Line 103 cross → crosses

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