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Statistical properties of magnetic structures during turbulent reconnection in the Earths magnetotail KENDRA BERGSTEDT, HANTAO JI, MATTHEW CHEN, Princeton Plasma Physics Laboratory — A current area of interest in plasma physics is the formation of plasmoids in reconnecting current sheets and the effect that these structures have on the reconnection process. We present a statistical survey of a set of magnetic structures observed by the Magnetospheric Multiscale (MMS) mission during a period of turbulent magnetotail reconnection. The dissipation and electron energization from this dataset were previously studied (Ergun et al. 2018). The magnetic structures have a bipolar magnetic signature in the Z direction in geocentric solar magnetospheric (GSM) coordinates and most have sizes on the order of the electron or ion inertial length. The structures are categorized as topologically X-like or O-like based on the type of bipolar signature and the directions of the electric currents and plasma flows within the structure. Distributions of their sizes and other properties are presented and fitted to empirical models. Evidence of merging plasmoids is presented, highlighting a possible mechanism of plasmoid growth. Implications of the reported results on our current understanding of turbulent reconnection mediated by plasmoids are discussed.

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