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Statistical properties of magnetic structures and energy dissipation during turbulent reconnection in the Earth's magnetotail KENDRA BERGSTEDT, HANTAO JI, JONATHAN JARA-ALMONTE, JONGSOO YOO, Princeton Plasma Physics Laboratory, ROBERT ERGUN, Department of Astrophysical and Planetary Sciences, University of Colorado Boulder, LI-JEN CHEN, NASA, Goddard Space Flight Center — We present the first statistical study of magnetic structures and associated energy dissipation observed during a single period of turbulent magnetic reconnection, by using the *in-situ* measurements of the Magnetospheric Multiscale mission in the Earth's magnetotail on July 26, 2017. The structures are selected by identifying a bipolar signature in the magnetic field and categorized as plasmoids or current sheets via an automated algorithm which examines current density and plasma flow. The size of the plasmoids forms a decaying exponential distribution ranging from sub-electron up to ion scales. The presence of substantial number of current sheets is consistent with a physical picture of dynamic production and merging of plasmoids during turbulent reconnection. The magnetic structures are locations of significant energy dissipation via electric field parallel to the local magnetic field, while dissipation via perpendicular electric field dominates outside of the structures. Significant energy also returns from particles to fields.

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