



Statistical analysis of the intense current structures in the dayside magnetopause boundary layer

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Current sheets are important structures in space plasma. Many plasma instabilities arise near strong current sheets, which are prone to collapse, leading to magnetic reconnection. In this study, we perform a statistical analysis of the intense current structure in the dayside boundary layer using the high-resolution data from the magnetospheric multiscale (MMS) mission. We have found more than 6,000 current structures with current density exceeding 1200 nA/m^2 , and analyzed its characteristics such as the spatial distribution, thickness, duration, energy dissipation, energy conversion and its relationship to reconnection. Through this comprehensive analysis, we may have a better understanding of these intense current structures and their role in the magnetosphere dynamics.

References

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