



Observations of the Electron Jet Generated by Secondary Reconnection in the Magnetotail

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We report in-situ observations of an electron jet generated by secondary reconnection within the outflow region of primary reconnection in the magnetotail by the Magnetospheric Multiscale (MMS) mission. MMS spacecraft firstly passed through the primary X-line, and then crossed the electron jet in the outflow of primary reconnection. There are a series of small-scale flux ropes in the secondary reconnection region. Decoupling from the magnetic field for both ions and electrons, intense out-of-plane current, and unambiguous Hall currents and Hall electromagnetic field appear in the electron jet. Strong electron dissipation ($J \cdot E' > 0$), nonzero electric field in the electron frame ($E' = E + v_e \times B \neq 0$) and electron crescent-like shaped distributions are detected in the center of electron jet, implying that MMS spacecraft were likely passing through the electron diffusion region. The significant electron dissipation in the electron jet indicates that electron jet may be another electron acceleration channel in the reconnection region besides electron diffusion region.