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## **Non-ideal Electric Field Observed in the Separatrix Region of a Magnetotail Reconnection Event**

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Based on high-resolution measurements from NASA's Magnetospheric Multiscale (MMS), we present a crossing of the current sheet with ongoing magnetic reconnection in the magnetotail. The electron inflow speed in the northern separatrix region was up to 4,000km/s and mainly field-aligned, and much larger than the reconnection outflow speed at its center. It appears that the electrons have been pre-accelerated before entering the electron diffusion region, and the estimated parallel electrostatic potential along the separatrix region could be the reason for the acceleration. In the same separatrix region, the electron frozen-in condition was violated and non-ideal electric field was inferred to be caused by gradient of the electron pressure tensor, which suggests that the inner electron diffusion region might extend along the separatrix region in the reconnection outflow direction. These observations indicate that a significant part of energy conversion takes

place in the separatrix region during reconnection.

### **References**

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