Nonideal Electric Field Observed in the Separatrix Region of a Magnetotail Reconnection Event

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The microphysics in the separatrix region (SR) plays an important role for the energy conversion in reconnection. Based on the Magnetospheric Multiscale observations in the magnetotail, we present a complete crossing of the current sheet with ongoing magnetic reconnection. The field-aligned inflowing electrons were observed in both separatrix regions (SRs) and their energy extended up to several times of the thermal energy. Along the SR, a net parallel electrostatic potential was estimated and could be the reason for the inflowing electron streaming. In the northern SR, the electron frozen-in condition was violated and nonideal electric field was inferred to be caused by the gradient of the electron pressure tensor. The nongyrotropic electron distribution and significant energy dissipation were observed at the same region. The observations indicate that the inner electron diffusion region can extend along the separatrices or some electron-scale instability can be destabilized in the SR.