



Transient Magnetic Reconnection and Dipolarization Fronts in the Terrestrial Magnetotail

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We report a Cluster observation of transient magnetic reconnection in the Earth's magnetotail at the location of [$X_{gsm} \sim -17.2$ RE, $Y_{gsm} \sim -4.5$ RE and $Z_{gsm} \sim 0$]. The reconnection X-line retreated tailward with a speed of 34 km/s based on multi-spacecraft analysis. An ion diffusion region with a weak guide field ($\sim 10\%$ of lobe field) was encountered during the flow reversal. A flux rope was embedded in the tailward flow. Transient suprathermal electron beams, which directed away from the X-line, were detected repeatedly around the separatrix region with periods of about 60s during the tailward flow bursts. On the earthward side of X-line, multiple earthward-propagating dipolarization fronts were observed quasi-periodically at the edge of the ion diffusion region with time period of 60s-90s. Particle and wave characteristics also show distinct signatures at different stages of the transient reconnection. The implications of this observation will be discussed.