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Investigation of the energy conversion associated with a series of dipolarization fronts observed by MMS

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In July 2017, the MMS constellation was in the magnetotail with an apogee of 25 Earth radii and an average inter-satellite distance of 10 km (i.e. at electron scales). On 23 July around 16:19 UT, MMS was located at the edge of the current sheet which was in a quasi-static state. Then, MMS suddenly entered in the central plasma sheet and detected the local onset of a small substorm as indicated by the AE index (~400 nT). Fast earthward plasma flows were measured for about 1 hour starting with a period of quasi-steady flow and followed by a saw-tooth like series of fast flows associated with dipolarization fronts. This plasma transport sequence finished with a flow reversal still occurring close to the magnetic equator. In the present study, we investigate the energy conversion processes at ion and electron scales for these different phases with particular attention on the processes in the vicinity of the dipolarization fronts.

Field

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