Multi-constellation observations of fast plasma flows: Implications for magnetotail reconnection

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Abstract

Magnetic reconnection in the Earth's magnetotail is a critical component of the energy flow through the Earth's magnetosphere. However, the cross-tail extent and coherence of reconnection in the magnetotail is not yet well understood. Analysis of the tail-wide extent of magnetic reconnection from in-situ observations has previously been confounded by the large spatial scale of the Earth's magnetotail. In this study, we leverage multi-constellation observations of the ejecta from magnetic reconnection sites to probe the cross-tail extent and coherence of reconnection. We use observations of bursty bulk flows and tailward jets by MMS and THEMIS within the plasma sheet to analyse the cross-tail distribution of these reconnection ejecta, which provides insight to the tail-wide extent of the X-lines that they originated from.

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