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Multi-spacecraft analysis of tailward plasma flows in the near-Earth plasma sheet : THEMIS observations

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In the near-Earth's plasma sheet, the magnetic field is abruptly dipolarized, associated with an aurora activity. In this region, most of plasma flows are earthward, while some are tailward. Although the candidate mechanism for such tailward flow is considered as rebound flows and/or a part of vortex flows, the quantitative occurrence rate is not fully understood. In this work, we selected events that THEMIS spacecraft observed tailward flows near the magnetic dipolarization region, and then categorized in flow patterns before the tailward flows. Based on the results, we statistically analyzed the categolized events, and estimated the space structure of tailward flows by multi-spacecraft analysis. Consequently, we show the occurrence rate of such rebound flows and the vortex flows.

Keywords: Dipolarization, Tailward flow