

R006-05

C会場 : 11/5 PM1 (13:45-15:30)

14:45~15:00

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Current sheet thinning associated with the dipolarization front

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We discuss on the transient deformation of the ambient current sheet associated with the dipolarization front. Recent multi-scale multipoint measurements by MMS and Cluster in the near Earth magnetotail during a unique conjugate observation of localized fast flows (Nakamura et al., 2021) showed that combination of the two multi-point missions enabled to determine the change in the overall flow and the current sheet changes while monitoring the detailed structure of the thin current sheet. It is shown that dipolarization front of a localized flow can lead to an additional thinning of the current sheet behind the front. Intense perpendicular and parallel currents in the off-equatorial region was detected mainly during this interval of the current sheet thinning. Another conjugate observations of the dipolarization front showed a strong magnetic shear region developed locally at dusk-side of the front. This region has been identified as an electron diffusion region of an X-line based on the non-magnetized signature of the electron distribution function (Marshall et al. 2020) and the geometry of the current sheet (Hosner et al., 2022). These observations indicate that the near-Earth flow braking processes accompany also complex localized current sheet restructuring. We also discuss potential mechanism how these transient thin current sheet can be created in the near-Earth magnetotail and the role of these current sheets in the energy conversion processes in the magnetotail.

Reference

Hosner, M., et al. (2022) Fall AGU Meeting

Marshall A. et al. (2020) J. Geophys. Res., doi:10.1029/2019JA027296

Nakamura, R. et al.(2021) J. Geophys. Res., doi:10.1029/2021JA029518