

Magnetic field fluctuations in the near-Earth magnetotail at substorm dipolarization onsets

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Using Geotail and THEMIS data, we have investigated low-frequency magnetic field fluctuations that were observed in the near-Earth magnetotail at $X \sim -10$ Re at substorm dipolarization onsets. A previous study showed that ballooning mode waves with a low-frequency range of ~ 0.01 Hz were observed near the magnetic equator just before dipolarization onsets for high plasma beta, while they were not observed for relatively low plasma beta. In the present study we analyze low-frequency waves in more detail and discuss the relationship between the ballooning instability, dipolarization, and substorm expansion onset.

Keywords: substorm, magnetotail, dipolarization, magnetic field fluctuation, ballooning