Locations of "reversed" cross-tail current at the substorm onsets: GOES-5 and AMPTE-CCE magnetic field observations

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It has been widely accepted that during substorm expansion onsets Pi 2 pulsations are observed globally at the dipequator, and magnetic field changes are often detected at the nightside geosynchronous orbit. Using high-time resolution magnetic field data from the geosynchronous satellite GOES 5 and the AMPTE CCE satelite, we examined the dynamical field changes in the nightside magnetosphere.The first peak in space are found to show a peculiar feature. In order to explain the peculiar feature, we propose that the current disruption region should be set up in the inner magnetosphere than 6.6Re during the substorm expansion onset. Furthermore, we will show a local time distribution of the events of the magnetic field change at the substorm expansion onset in the nightside magnetosphere.

It has been widely accepted that Pi 2 geomagnetic pulsations at equatorial and low latitudes on the ground and magnetic field changes toward the dipolar configulation at geosynchronous altitudes in the midnight sector are the most common signatures around the substorm onsets. Using the high-time resolution data of magnetic field acquired with GOES 5 and AMPTE CCE satelites in the region of L~4-9 Re, we examined the temporal variations of magnetic field associated with the substorms during the interval from March 1 to December 31, 1986. Characteristics that we have determined here include the following : Peculiar features in the magnetic field variations are confirmed to occur at the substorm onsets and in the inner magnetospheric region earthward of 6.6Re, in the limited local time sector in the Y-direction. There features are thought to be ascribable of an occurrence of "reversed" cross-tail current(flowing dusk-to dawn).