

## Variations in the magnetotail associated with substorm auroral breakups

# Yukinaga Miyashita[1], Shinobu Machida[2], Toshifumi Mukai[3], Yoshifumi Saito[3], Hajime Hayakawa[3], Koichiro Tsuruda[3]

[1] Dept. of Geophysics, Kyoto Univ., [2] Dept. of Geophys., Kyoto Univ., [3] ISAS

We have statistically investigated the three-dimensional structure of variations in the magnetotail associated with substorm onsets using GEOTAIL and Polar UVI data. We selected 402 substorm events from auroral breakups in the present study, while Pi2 pulsations were used in determining substorm onsets in our previous studies. On the whole, the results in the present study are similar to those in our previous studies. Variations first start around  $X=-20$  Re in the premidnight tail slightly before onset and are seen around  $X=-10$  Re and  $X=-30$  Re immediately after onset. We concluded that the magnetic reconnection occurs around  $X=-20$  Re in the premidnight tail slightly before onset. After onset, the dipolarization occurs around  $X=-10$  Re simultaneously with substantial evolution of the plasmoid around  $X=-30$  Re.