

Enhancements of lobe plasma convection and aurora substorm dynamics

Tsuyoshi Itami[1], Satoshi Taguchi[2], Mamoru Ishii[3], Minoru Kubota[3], Shin-ichiro Oyama[3], Yasuhiro Murayama[3], Toshifumi Mukai[4], Yoshifumi Saito[4]

[1] Univ. of Electro-Communications, [2] Univ. of Electro-Communications, [3] CRL, [4] ISAS

Recent studies have suggested that it is after substorm onsets when reconnection reaches lobe field lines. How lobe reconnection is associated with auroral dynamics after onsets have been examined with data from Geotail in the mid-tail lobe and from meridian scanning photometer (MSP) at Poker Flat, Alaska. We surveyed for lobe convection enhancements toward the neutral sheet from Geotail mid-tail lobe observations from January 1996 to April 1998. This convection enhancement event can be used as evidence for lobe reconnection. For the events identified in winter seasons, we examined MSP 630.0 and 557.7 nm emission data. Requiring that Poker Flat should be in the premidnight and that the observed aurora should have some well-defined substorm characteristics, we found one auroral substorm that almost simultaneously occurred with Geotail lobe convection enhancements. Comparison between MSP and Geotail data for this simultaneous observation event indicates that lobe reconnection can be related to the gradual equatorward motion of the aurora intensification after the explosive poleward motion. Magnetospheric states corresponding to these motions and possible mechanisms will be discussed.