

## Characteristics of Magnetic Field Variation Observed by ETS-VIII during the Explosive Growth Phase of Substorms

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In this study, we analyzed magnetic field variation observed by the geostationary satellite ETS-VIII (Engineering Test Satellite-VIII) during magnetospheric substorms. The field configuration quickly changes from tail-like to dipole-like during the explosive growth phase of magnetospheric substorms. The magnetic data from MAGDAS (MAGnetic Data Acquisition System) were used to identify the onset of magnetospheric substorms. At the onset of the magnetospheric substorms, Pi 2 magnetic pulsations occur globally in the magnetosphere. The analysis period covered two months from March to April 2008.

The following results are obtained;

(1) Time lags from the Pi2 onsets to the beginnings of the explosive growth phase at the synchronous orbit ( $T(\text{ETS-VIII}) - T(\text{Pi2})$ ) are found to be shortest in the pre-midnight region (20:00-23:00LT). The averaged time lags of H-, D-, and Z-components are 0.8min, -0.2min, and -0.2 min, respectively.

(2) In the other region, the time lags are found to be longer than that of the pre-midnight region (20:00-23:00LT).

\* In the region 18:00-20:00LT, the averaged time lags of H-, D-, and Z-components are 8.5 min, 6 min, and 5.6 min, respectively.

\* In the region 23:00-02:00LT, the averaged time lags of H-, D-, and Z-components are 14.3 min, 11.3 min, and 14.8 min, respectively.

These observations at ETS-VIII during the explosive growth phase of magnetospheric substorms can be explained by the substorm convection model proposed by Tanaka et al. (2010, JGR, in press).