

Characteristics of Equatorial Pi 2 Pulsations Observed at the MAGDAS Stations

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At the onset of magnetospheric substorms, impulsive hydromagnetic oscillations with periods of 40-150 sec, so called Pi 2 magnetic pulsations, occur globally in the magnetosphere. Low-latitude Pi 2 magnetic pulsations have been regarded as a good indicator of substorm onsets for the past three decades (e.g., Saito et al., 1976; Yeoman et al., 1994). But, Liou et al. (2000) compared Pi 2 onsets observed at a single station (Kakioka, $L = 1.07$) with the auroral breakups identified by the Polar ultraviolet images, and concluded that Pi 2 observed at a single low-latitude station may not be as a good indicator of the substorm onset as it was thought to be.

In order to examine how many substorm onsets we can identify by using the equatorial Pi 2 pulsations observed at the world-widely separated stations, we analyzed magnetic data from the MAGDAS stations near the dip equator at ILR (Dip Lat = -2.95, M. LONG = 76.80), AAB (0.56, 110.47), CEB (2.73, 195.06), ANC (0.72, 354.33), EUS(-7.00, 34.21). The Space Environment Research Center (SERC), Kyushu University started to deploy a new ground-based magnetometer network (i.e., MAGDAS; MAGnetic Data Acquisition System in real time), in cooperation with about 30 organizations in the world during the period of International Heliophysical Year (IHY).

From analyses of the MAGDAS data, we can find the following wave characteristics of equatorial Pi 2 pulsations; (1) Pi 2 pulsations observed near the dip equator show an amplitude enhancement around each 10:00 -13:00 local time. (2) The closer the observation site is to the dip equator, the Pi 2 amplitudes tend to become larger. (3) The Pi 2 amplitudes tend to become larger as the ambient total field intensity at the observation site gets lower.