

## A Study of Equatorial Pi 2 Pulsations at MAGDAS/CPMN:Toward A New Pi 2-Index

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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, are excited globally in the magnetosphere. From analyses of magnetic data from the Circum-pan Pacific Magnetometer Network (CPMN) stations, Yumoto et al.(2001) found that (1) Pi 2 pulsations observed on the ground are an ensemble of various hydromagnetic modes excited at high, middle, low, and equatorial latitudes. (2) There are apparent longitudinal propagation and latitudinal time delays of the maximum Pi 2 magnetic energy among the CPMN stations within 100 sec. (3) Only when Pi 2s are observed at a low-latitude station in the midnight sectors of 23-01 hr LT, we can see the 100% one-to-one correspondence between the Pi 2s and auroral breakups identified by the Polar satellite, but 66% of the low-latitude Pi 2s occurred within 1 min of the auroral breakups, and 85% within 2 min. They concluded that Pi 2s are still a good indicator of substorm onsets, but they should be used with care.

From 2005, Space Environment Research Center, Kyushu University, is deploying new 50 MAGDAS/CPMN (MAGnetic Data Acquisition System in the Circum-pan Pacific Magnetometer Network) stations along the 210-degree magnetic meridian, the magnetic dip equator, and the 96-degree magnetic meridian. In order to nowcast magnetospheric substorms by using a new Pi 2-index, we are investigating characteristics of equatorial Pi 2 pulsations observed at the MAGDAS/CPMN stations. In the present paper, we examine local time dependence of low-latitude and equatorial Pi 2 pulsations simultaneously observed during two months of January-February, 2001, at Ewa Beach (EWA; G. Lat. = 21.32N, G. Long. = 158.0W, Dip Lat. = 38.03), Hawaii, USA, and Christmas Island (CXI; 2.05N, 157.5W, 5.31), Kiribati, respectively.

It is found that (1) in the nighttime sector (20:00-04:00 LT) Pi 2 amplitudes at EWA and CXI stations are comparable (i.e.,  $\text{Amp}(\text{CXI})/\text{Amp}(\text{EWA}) = 1.2$ ), while those show the equatorial enhancement (i.e.,  $\text{Amp}(\text{CXI})/\text{Amp}(\text{EWA}) = 2.4$ ) in the daytime sector (10:00- 18:00 LT). (2) Correlation coefficients of the Pi 2 amplitudes at EWA and CXI are 0.95 and 0.93 in the daytime and nighttime sector, respectively. These observational results can be explained by the cavity mode oscillation in the nighttime and the EEJ oscillation in the daytime.