From 1996, the Department of Earth and Planetary Sciences and the Space Environment Research Center, Kyushu University, are conducting the Circum-pan Pacific Magnetometer Network (CPMN) / Magnetic Data Acquisition System (MAGDAS) project: (PI; K. Yumoto) along the 210° magnetic meridian (MM) from high latitudes through middle and low latitudes to the equatorial region, spanning L = 8.50-1.00, in cooperation with 29 organizations in Australia, Indonesia, Japan, Papua New Guinea, Philippines, Russia, Taiwan, and the United States [Yumoto et al, 2001] and the magnetic equator [Tachihara et al., 1996]. Then it was possible to investigate global characteristics of Pi 2 pulsations and one-to-one correspondence between Pi 2s and substorm onsets (i.e. auroral breakups).

In the present paper, we summarized the related characteristics of Pi 2s, and newly analyzed magnetic data from the ground MAGDAS network [Yumoto et al., 2006] and the ETS-8 satellite [Goka et al., 2007]. We will present wave characteristics of Pi 2s, showing the global amplitude distribution, phase relation at the separated stations, and timings of the initial movement of H- and D-component Pi 2 pulsations. From these observational facts, we can conclude that the substorm current wedge (SCW) is the main source of Pi 2 magnetic pulsations, and generates a transient oscillation of lower frequency at high latitudes, a magnetospheric cavity oscillation of higher frequency at lower latitudes, and a FAC oscillation in the mind-night sector.