

Latitudinal and Longitudinal dependence of the Pi2 onset time

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In this study, we have analyzed the longitudinal dependence of Pi2 onset times obtained by applying a newly-developed onset-determination method, which is based on a definition in literature [Saito, 1961] and uses the Bayesian statistical inference, to the ground CPMN magnetometer data.

Pi2 magnetic pulsations occur in the magnetosphere and are globally observed on the ground. Its wave period is 40-150 seconds and its waveform is irregular. It was very difficult to determine the onset time of Pi2, because of its gradual variation in its initial part. Recently, we have successfully constructed a determination method of the Pi2 onset time, which is based on the definition in literature [Saito,1961] and uses the Bayesian statistical inference for more accuracy and objectivity. By applying this method to magnetometer data from almost longitudinally-aligned stations and a reference low-latitude station GAM (GMLat.=5.61[deg], GMlon.=215.55[deg], L=1.03), we have estimated differences in the Pi2 onset times between GAM and the other stations, and examined the latitudinal dependence of the Pi2 onset time. As a result, we have obtained a wide scatter of the time lags between GAM and the high-latitude stations; we infer that this scatter is caused by a longitudinal Pi2 propagation.

In order to test the above inference, we have further examined the longitudinal dependence of the time lags of the Pi2 onset times by using the TIK (GMLat.=65.65[deg], GMlon.=196.90[deg], L=5.98) and CHD (GMLat.=64.66[deg], GMlon.=212.14[deg], L=5.55) data. We will discuss a global propagation mechanism of Pi2 in the presentation of this paper.