

Determination of onset times of low-latitude Pi2 magnetic pulsations -Examination with two methods-

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Pi2 magnetic pulsations are observed globally and their occurrences are almost simultaneous with substorm onsets; therefore Pi2 has been known as a good indicator of the onset of substorm. However, its trigger process, propagation mechanism and relationship with substorm have not been well understood. In addition, it is very difficult to objectively determine the Pi2 onset time; a visual inspection for determining the Pi2 onset time could make its estimate biased. Therefore, it is necessary to establish an accurate and objective determination method.

We have constructed and examined two procedures for an onset time determination of low-latitude Pi2. The first method is based on such assumption that Pi2 is described by stochastically perturbed quasi-periodic oscillations which have relatively longer period in its initial stage rather than in the rest. We applied the time-series analysis method developed for such data [Higuchi et al., 2002]. The second procedure that we developed relies on the definition in literature [Saito,1961] that Pi2 starts with positive dH/dt in the middle or low latitude. We examined the differenced sequences of the H-component and identified a positive variation seen in them with bayesian statistical inference method. Then, we have compared these results. In this meeting, we will discuss the accuracy of these two methods.