

Local-time Dependence of the Phase Lags of Pi2 Pulsations Observed at Different Stations

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We calculated the time lags between the Pi2 pulsations observed at different stations in middle or low latitude using a cross-correlation analysis, and we took their statistics.

We found that the Pi2 pulsations observed on the ground have different propagation characteristics between the H(horizontal) component and the D(declination). This result indicates that the low latitude Pi2 pulsations propagate in different modes for each component. We also found the different characteristics in Northern and Southern hemispheres.

In this presentation, we discuss the propagation characteristics of Pi2 pulsations and compare them with those in the models proposed by other researches.

The Pi2 pulsations are defined as an oscillation of geomagnetic field in the period range from 40 to 150 seconds and usually occur at substorm onset. There have been many researches on the Pi2 pulsations, but the details of the propagation mechanism is still an open question.

In our analysis, Pi2 pulsations were detected by the wavelet analysis in the 1 second resolution geomagnetic data from 6 ground stations in middle or low latitudes, i.e., Kakioka, Memambetsu, Kanoya, Urumqi, Crozet and Port Aux Francais. We calculated the time lags between the Pi2 pulsations observed at different stations using a cross-correlation analysis, and statistically analysed the local-time dependence of the time lags. Then it was found that the Pi2 pulsations on the ground have different traveling characteristics for the horizontal component and the declination. This result indicates that the low or middle latitude Pi2 pulsations propagate with different modes for each component. We also found the different properties of low latitude Pi2 pulsations in Northern and Southern hemispheres.

In this presentation, we discuss the propagation characteristics of the Pi2 pulsations and compare them with those in the models proposed by other researches.