

Dispersion relation of Pc1 geomagnetic pulsations using ground-magnetometer observations

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Pc1 geomagnetic pulsation (Pc1) observed on the ground at subauroral latitudes ($L \sim 4$) is the signature of ion cyclotron waves with frequencies 0.2-5.0Hz near the plasmopause. When the waves reach onto the ionosphere, they induce the Pedersen and Hall currents which generate both Alfvén and fast mode waves in the ionospheric duct. On the ground we observe the variations of the magnetic field caused by both of the Alfvén and the fast mode wave in the ionospheric duct. Previous studies based on the theoretical models showed the frequency dependence of attenuations, and the spatial distribution of wave polarisations, and furthermore, predicted the dispersion relation in the ionospheric duct. Especially for the characteristics of attenuations and polarisations, previous studies have been established using ground magnetometer observations. Yet, no study has demonstrated the Pc1 dispersion relation experimentally. In our presentation, we show the Pc1 dispersion relation obtained by the wave telescope analysis using CARISMA ground magnetometers.

Keywords: Pc1, EMIC waves, dispersion relation, ionospheric duct