

Characteristics of azimuthally polarized Pi 2 pulsations on the morning side

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Pi 2 pulsations are globally observed on the ground at the onsets of substorms. On the morning side, the amplitude of the D-component Pi 2 pulsation increases due to the sunrise effect (Saka et al., [1980]). However, there are few studies about this phenomenon, and its mechanism is still unknown. We analyzed azimuthally polarized Pi 2s on the morning side using data from the MAGDAS global magnetometers network. The following results are found; (1) D-component oscillations at low-latitude station were synchronized among D-component high-latitude oscillations and H-component dip-equator oscillations. (2) The amplitude of the D-component oscillation increases with latitude. (3) The oscillations in the D-component shows the out-of-phase relationship between postmidnight and morning side. (4) The oscillations in the D-component shows the out-of-phase relationship between the southern and northern hemispheres. From the result (3), the D-component oscillations on the morning side are deferent from magnetic fluctuations caused by the downward FAC oscillation of a substorm current wedge. We suggest that the north-south ionospheric current controls the azimuthal oscillation on the morning side.

Keywords: Pi 2 pulsations, ULF waves, ionospheric current, substorm current wedge, multipoint ground-based observation