

Polarization Characteristics of Pi2 pulsations observed at low- and high- latitude stations and on Cluster

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Pi2 pulsations occur over a wide latitudinal range on the nightside at substorm onset. Pi2 pulsations in the compressional component, which have a high coherence and out-of-phase relationship to those at low latitude, are found outside the plasmasphere at high latitudes in the inner magnetosphere ($RE < 4$) [Kim et al., 2009; Teramoto et al., 2008].

We have investigated the relationships of Pi2 pulsations observed at mid and high latitudes and outside the plasmasphere at high latitude in the inner magnetosphere. We used data from the polar orbiting Cluster satellites. We focus on a case study at 2212UT on 5 March 2004, when Cluster was located on the nightside (MLT=2259UT-23:06UT) at high latitude (-50.85[deg]-52.25[deg]) in the Southern hemisphere outside the plasmasphere. Cluster observed Pi2 pulsations in the compressional and radial components. The power of these variations had clear peaks at 11 mHz. Pi2 pulsations simultaneously occurred at Hermanus (HER), the SAMNET and IMAGE magnetometer arrays, Syowa Station (SYO), Davis (DAV) and Casey (CAS). Pi2 pulsations observed by the satellites had a high coherence and out-of-phase relationship with those observed in the H component at HER and DAV and mid-latitude stations of SAMNET at 11 mHz. The polarizations observed at high- and mid-latitude stations of SAMNET and IMAGE array were clockwise. HF radar (SuperDARN) at Thykvihaer observed Pi2 pulsations in the ionospheric electric field, whose oscillations were similar to those observed by Cluster satellites and mid- and low-latitude stations. In this presentation, we will discuss possible source mechanisms of the Pi2 pulsation.