

Simultaneous observation of Pi2 pulsations by DE-1, AMPTE/CCE and ground stations over wide latitude

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Pi2 pulsations (period from 40s to 150s) are observed at substorm onset. Cavity mode resonance is the possible scenario of low-latitude Pi2 pulsations. It is an open question whether the resonance boundary, plasmopause, is good reflector or not.

At 1804-1814 UT on July 24, 1986, we investigated Pi2 pulsations simultaneously observed in the compressional component by the polar orbiting DE-1 satellite (an apogee: about 3.6 Re altitude and a perigee: about 500km altitude) and the equatorial orbiting AMPTE/CCE satellite (an apogee: about 8.8 Re altitude and a perigee: about 1100km altitude). DE-1 and AMPTE/CCE were located on the nightside outside the plasmasphere (2.64 MLT and L=8.7) and near the plasmopause (21.8 MLT and L=3.2). The coherence and phase difference between them were high (~ 1) and 180 degrees at 10 mHz. They had high coherence with that observed at Kakioka (KAK) in the H component, which was located at 3.21 MLT and L=1.25. The phase difference between KAK and DE-1 and between KAK and AMPTE/CCE were 180 and 0 degrees at 10 mHz. These Pi2 pulsations had also high coherence with that observed by Port Aux Francais (PAF) located at L=3.42 and 22.1 MLT. These observational results may support that the plasmopause is imperfect boundary. Pi2 pulsations at low latitude are excited by the plasmaspheric virtual resonance mode, in which the ambient magnetic fields outside plasmasphere oscillate with the cavity mode resonance. In this presentation, we will show these Pi2 pulsations observed by DE-1, AMPTE/CCE, PAF, and KAK, in addition to other ground stations (Hermanus, Furstenfeldbruck, and Wingst) and conduct a statistical study of Pi2 pulsations, which were simultaneously observed by the DE-1 and AMPTE/CCE satellite.