New Perspectives on Earth's Inner Magnetosphere

Convener:*Danny Summers (Dept of Math and Stats, Memorial University of Newfoundland), Yusuke Ebihara (Research Institute for Sustainable Humanosphere, Kyoto University), Yoshizumi Miyoshi (Solar-Terrestrial Environment Laboratory, Nagoya University), Chair: Yoshizumi Miyoshi (Solar-Terrestrial Environment Laboratory, Nagoya University)

Mon. Apr 28, 2014 4:15 PM - 6:00 PM  311 (3F)

Earth’s inner magnetosphere is a complex, dynamic plasma environment which includes the radiation belts, ion/electron ring current, plasmasphere, and ionosphere at auroral/sub-auroral latitudes. This session invites papers on all facets of inner magnetosphere research, including recent observations from space and ground, simulations, modeling and theory. Reports of particle, wave, and field data from the Van Allen Probes are particularly welcome, in addition to observations from other satellite missions such as THEMIS, POES, Cluster, and Akebono as well as ground-based facilities such as SuperDARN and magnetometers. Papers related to the planned JAXA mission ERG are also especially encouraged. The ERG satellite, with an expected launch in 2015-2016, will explore in particular how relativistic electrons are generated in the inner magnetosphere during disturbed geomagnetic conditions. Both science-related and instrument-related papers on ERG are solicited, including ground-based observations and simulations. Recent advances in the analysis of magnetospheric wave-particle interactions via particle simulations and nonlinear theory are also welcome.

Dispersion relation of Pc1 geomagnetic pulsations using ground-magnetometer observations

Reiko NOMURA¹, Ferdinand PLASCHKE², Yasuhiro NARITA², Karl-heinz GLASSMEIER¹, Shigeru FUJITA³, Ian MANN⁴ (1.IGEP, TU Braunschweig, 2.Space Research Institute Austrian Academy of Sciences, 3.Meteorological College, Japan Meteorological Agency, 4.University of Alberta)

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

Pc1 geomagnetic pulsation (Pc1) observed on the ground at subauroral latitudes (L~4) is the signature of ion cyclotron waves with frequencies 0.2-5.0Hz near the plasmapause. When the waves reach onto the ionosphere, they induce the Pedersen and Hall currents which generate both Alfven and fast mode waves in the ionospheric duct. On the ground we observe the variations of the magnetic field caused by both of the Alfven 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.