[EE] Evening Poster | P (Space and Planetary Sciences) | P-EM Solar-Terrestrial Sciences, Space Electromagnetism & Space Environment

[P-EM15]Dynamics in magnetosphere and ionosphere

convener:Yoshimasa Tanaka(National Institute of Polar Research), Tomoaki Hori(Institute for Space-Earth Environmental Research, Nagoya University), Aoi Nakamizo(情報通信研究機構　電磁波研究所, 共同), Mitsunori Ozaki(Faculty of Electrical and Computer Engineering, Institute of Science and Engineering, Kanazawa University)

Mon. May 21, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

This session provides an opportunity to present recent results from satellite and ground-based observations and theoretical and simulation studies on the magnetosphere, ionosphere, and their coupling system. We invite contributions dealing with various phenomena related to the magnetosphere-ionosphere system: solar wind-magnetosphere interaction, magnetosphere-ionosphere convection, field-aligned current, magnetic storms/substorms, neutral-plasma interaction, ionospheric ion inflow and outflow, aurora phenomena, and so forth. Discussions on planetary and satellite ionosphere and magnetospheres, future missions and instrument developments are also welcome.

[PEM15-P15]Transport and acceleration of electrons trapped in the inner magnetosphere in response to interplanetary shock

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Interplanetary (IP) shock is known to disturb directly energetic trapped electrons in the inner magnetosphere. Recently, it has been pointed out that electrons are accelerated due to interaction with whistler mode waves. The whistler mode waves are excited by anisotropic electrons in the keV-range. It may be possible that the IP shock influences the keV-range electrons, enhancing the energetic electrons indirectly. To understand the direct and indirect processes, we need to track the overall evolution of the electrons from keV to MeV ranges in response to the IP shock. In this paper, we used The global MHD simulation (Tanaka, 2015; Ebihara and Tanaka, 2015) and Comprehensive Inner Magnetosphere-Ionosphere (CIMI) model (Fok et al., 2014). In MHD simulation, as the boundary condition to obtain steady state magnetosphere, solar wind velocity (Vsw) is 400 km/s, density (Nsw) is 5 /cm^3 and interplanetary magnetic field (IMF) is 5 nT and northward. For imitation IP shock, we made Vsw sqrt 6 times, Nsw 6 times and IMF southward. In CIMI model, as the initial condition, we used AE8 model and kappa distribution (κ= 4) and the boundary condition is from MHD simulation. We found that the temperature anisotropy increased at four points (MLT = 12, L = 4.7 : MLT = 0, L = 5.2 : MLT = 0, L = 4.5 : MLT = 8, L = 5). At MLT = 12, L = 4.7, shock-induced E-field accelerated electrons and the flux of electrons with energy more than 1 keV increased, resulting in temperature anisotropy over 0.4. At MLT = 0, L = 5.2, convection E-field accelerated electrons and the flux of electrons with energy about 15 keV increased, resulting in temperature anisotropy over 0.5. At MLT = 0, L = 4.5, substorm-induced E-field accelerated electrons and the flux of electrons with energy about 20 keV increased, resulting in temperature anisotropy over 1.7. At MLT = 8, L = 5.0. the flux of electrons energy with about 100 keV and 1 keV increased, resulting in temperature anisotropy over 0.4. Addition to this, we should consider the temperature anisotropy of the electrons what have the resonance velocity with chorus waves. We call this temperature anisotropy as A^-. We will reveal the time change of A^- and electrons what is the cause of A^- increasing.