[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-P23]Electron inertia effect on the feedback instability in the magnetosphere-ionosphere coupling system

*Masatoshi Kaneyama[1], Watanabe Tomohiko[1], Shinya Maeyama[1] (1.Nagoya University)

Keywords:Aurora, magnetosphere-ionosphere coupling, Alfven wave

A possible mechanism of quiet auroral arcs is described in terms of the feedback instability which develops through resonant interactions between the Alfven waves in the magnetosphere and the plasma density waves in the ionosphere. In previous studies, linear and nonlinear numerical simulations of auroral arc growth were carried out by means of the reduced-MHD model for the magnetosphere.

In this research, we have added the electron inertia term to the reduced-MHD model to introduce the parallel electric field (*Epara*) along field lines. As *Epara* can accelerate electrons, the new model enables us to describe the growth of auroral arcs and the electron acceleration simultaneously in a numerical simulation.

As the first step, we have analyzed the linear dispersion relation including the electron inertia effect, and compared the linear frequency and growth rate with those obtained from the conventional model. It turns out that the lower frequency is found for the higher wave number while the growth rate is smaller in the former for all wavenumbers. We have also examined *Epara* and energy transfer rate dependence on the magnetospheric height and on the perpendicular wave number (*kperp*). The results show that *Epara* works as acceleration in case with a positive growth rate, and vice versa. Furthermore, we will show the results of nonlinear simulation in the presentation.