

[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-P24]3D current system of eastward expanding auroral surges

*Yoshimasa Tanaka¹, Yasunobu Ogawa¹, Akira Kadokura¹, Bjorn Gustavsson², Noora Partamies³, Kirsti Kauristie⁴, Daniel Whiter⁵, Carl-fredrik Enell⁶, Urban Brandstrom⁷, Tima Sergienko⁷, Alexander Kozlovsky⁸, Heikki Vanhamaki⁹, Akimasa Yoshikawa¹⁰, Hiroshi Miyaoka¹ (1.National Institute of Polar Research, 2.The Arctic University of Norway, 3.The University Centre in Svalbard, 4.Finnish Meteorological Institute, 5.University of Southampton, 6.EISCAT Scientific Association, 7.Swedish Institute of Space Physics, 8.Sodankyla Geophysical Observatory, 9.University of Oulu, 10.Kyushu University)

Keywords:auroral computed tomography, 3D current system, local KRM method, magnetosphere ionosphere coupling system, eastward expanding auroral surges

We investigate three-dimensional (3D) current system of eastward expanding auroral surges (EEASs) observed by ground-based network of all-sky imagers and magnetometers in Fennoscandia on March 9, 2013. Three EEASs were observed intermittently at about 15-minute intervals in the post-midnight sector (01:55-02:40 MLT) by three monochromatic (428nm) all-sky EMCCD imagers at Tromso (69.6N, 19.2E), Norway, Kilpisjarvi (69.0N, 20.9E), Finland, and Abisko (68.4N, 18.8E), Sweden and the IMAGE chain magnetometers. These data set allowed us to retrieve the height-integrated ionospheric conductivity in the horizontal area of about 300km by 300km and ionospheric equivalent current at high-sampling (10-seconds) intervals. The ionospheric conductivity was estimated from 3D distribution of the 427.8nm volume emission rate, which was obtained by applying the auroral computed tomography (ACT) method to multiple auroral images, and some theoretical and empirical models. Furthermore, we calculated horizontal distributions of ionospheric current, field-aligned current (FAC), and electric field at 10-sec resolution by the local KRM method using the obtained height-integrated ionospheric conductivity and equivalent current. The results indicate that a pair of upward and downward FACs was accompanied by the EEASs and the divergence of the ionospheric Hall current due to the ununiform conductivity may be a significant component of FACs for EEASs.