

International Session (Oral) | Symbol P (Space and Planetary Sciences) | P-EM Solar-Terrestrial Sciences, Space Electromagnetism & Space Environment

[P-EM06_30PM2] Study of coupling processes in Sun-Earth system with large radars and large-area observations

Convener: *Mamoru Yamamoto (Research Institute for Sustainable Humanosphere, Kyoto University), Yasunobu Ogawa (National Institute of Polar Research), Satonori Nozawa (Solar-Terrestrial Environment Laboratory), Hiroyuki Hashiguchi (Research Institute for Sustainable Humanosphere, Kyoto University), Chair: Hiroyuki Hashiguchi (Research Institute for Sustainable Humanosphere, Kyoto University)

Wed. Apr 30, 2014 4:15 PM - 6:00 PM 312 (3F)

The Earth accepts huge input of energy and material from the Sun. The Earth's environment is maintained by the balance between their inputs and outputs. It is important to study energy and material transport of the Earth. This is an international session that discusses studies of the coupling processes in the Sun-Earth system based on the projects of large radars and large-area observation network. The facilities and networks included are the Equatorial MU Radar (EMU) in Indonesia to study the whole equatorial atmosphere, the EISCAT_3D radar system to study detailed structures and elementary processes of the magnetosphere-ionosphere in the polar region, and global observation networks of magnetometers and radio and optical instruments to study the coupling processes with the global scale. We will show outline of the project and discuss sciences by soliciting variety papers. This session is open to the world, and we strongly encourage submission of papers related to other facilities and projects, i.e., atmospheric or incoherent-scatter radars, observation networks, satellites, and simulation or theoretical studies, etc.

5:15 PM - 5:30 PM

[PEM06-P12_PG] Relationship between Latitudinal Extension of Scintillation and Pre-reversal Enhancement in the Southeast Asian Region

3-min talk in an oral session

*Prayitno ABADI¹, Yuichi OTSUKA², Asnawi HUSIN¹, Jiyo JIYO¹, Mamoru YAMAMOTO³, Toshitaka TSUDA³
(1. National Institute of Aeronautics and Space (LAPAN), 2. STEL, Ngoya University, 3. RISH, Kyoto University)

Keywords: Ionosphere, Scintillation, Pre-reversal enhancement

We have investigated the relationship between the maximum latitude extension of observed scintillations (L_{max}) and the maximum altitude of the equatorial F-region bottomside ($h'F_{max}$), peak of eastward electric field (E_{max}), and time duration of eastward electric field (TE) during PRE period in the equatorial region. We used three GPS receivers installed in Kototabang (0.2S, 100.3E; 10.0N magnetic latitude), Pontianak (0.02S, 109.3E; 8.9S magnetic latitude), and Bandung (6.9S, 107.6E; 17.5S magnetic latitude), Indonesia for observing scintillation activity in period 18.00-22.00 LT (LT=UT+7h) and two frequency modulated-continuous wave (FM-CW) ionosondes installed near equator magnetic, Chumphon (10.7N, 99.4E; 3.3N magnetic latitude), Thailand and Bac Lieu (9.3N, 105.7E; 1.7N magnetic latitude), Vietnam for measuring PRE parameters, such as $h'F$, vertical drift ($dh'F/dt$) which indicates eastward electric field, and TE. Our observation period is during equinox months (March, April, September, and October) in 2010, 2011, and 2012. We divide the relationships into two groups; 1) the relationships between PRE parameters obtained from Chumphon ionosonde and L_{max} observed by Kototabang and Bandung GPS receivers and 2) PRE parameters obtained from Bac Lieu ionosonde and L_{max} observed by Pontianak and Bandung GPS receivers. The following table is to show the coefficient correlation (R) of

the relationships for each group. The results indicate that duration of eastward electric field does not play an important role for extension of the plasma bubble or latitudinal extension of scintillation, and that the peak of h'F and magnitude of E at the initial phase of plasma bubble generation (PRE period) is a primary factor for the plasma bubble extension. Therefore, the maximum latitude of scintillation is determined at the initial phase of plasma bubble generation (PRE period) in the equatorial region.-----

-----Relationship R (group 1) R (group 2)-----
 ----h'Fmax vs Lmax 0.596 0.471E_{max} vs Lmax 0.489 0.270TE vs Lmax 0.054 0.090-----
