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

[P-EM28_29PM1]Magnetosphere-Ionosphere Coupling

Convener:*Shin'ya Nakano(The Institute of Statistical Mathematics), Yoshimasa Tanaka(National Institute of Polar Research), Tomoaki Hori(Nagoya University Solar Terrestrial Environment Laboratory Geospace Research Center), Chair:Shin'ya Nakano(The Institute of Statistical Mathematics), Yoshimasa Tanaka(National Institute of Polar Research), Tomoaki Hori(Nagoya University Solar Terrestrial Environment Laboratory Geospace Research Center)

Tue. Apr 29, 2014 2:15 PM - 4:00 PM 413 (4F)

This session targets the comprehension of phenomena stemming from magnetosphere-ionosphere coupling processes. We invite presentations which focus on understanding of multi-scale coupling in the context of compound system, investigation of coupling between high latitude and middle/low latitude, and elucidations of coupling processes from the viewpoint of elementary process. Suggestions for innovative observational/data-analysis techniques, simulation, and theory are most welcome.

2:15 PM - 2:30 PM

[PEM28-P03_PG]Approximate formula of daytime ionospheric conductance ratio

3-min talk in an oral session

*Akimasa IEDA[1], Shin-ichiro OYAMA[1], Ryoichi FUJII[1], Aoi NAKAMIZO[2], Tomoaki HORI[1], Akimasa YOSHIKAWA[3], Nozomu NISHITANI[1] (1.STEL, Nagoya University, 2.Finish meteological institute, 3.Kyushu University)

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Solar zenith angle (SZA) dependences of daytime ionospheric conductances are studied. In particular, we developed a simple theoretical form for the Hall to Pedersen conductance ratio against SZA. The European incoherent scatter (EISCAT) radar observations located at Tromso (67 MLAT) on 30 March 2012 were used to calculate conductances.Daytime electric conductances in the ionosphere are associated with plasmas created by Solar extreme ultraviolet radiation into the neutral atmosphere of Earth. Previous conductance models have been either consistent or not with the ideal Chapman theory of such plasma productions. Our results indicate that the SZA dependence of the Pedersen conductance can be consistent with the Chapman theory after modifications. Such modifications include an approximation of vertically-uniform plasma densities in the topside E region, and taking atmospheric temperature upward gradient into account. The Hall conductance decreases with increasing SZA more rapidly than the Pedersen conductance does. This is because that the Hall conductivity layer thins from noon toward night.