Geophysical Research Abstracts
Vol. 16, EGU2014-1975, 2014
EGU General Assembly 2014

Quantitative Analysis of Magnetosphere-Ionosphere-Atmosphere Coupling Processes in the Region of Electron Diffuse Aurora

George V. Khazanov and Alex Glocer
NASA, GSFC, Greenbelt, United States (george.v.khazanov@nasa.gov)

Diffuse auroral precipitation covers a broad range of geomagnetic latitudes, which map along field lines from the inner magnetosphere to the plasma sheet. This precipitation of energetic electrons is a consequence of pitch-angle scattering due to interactions with assorted types of plasma waves. The diffuse aurora is a critically important source of ionizing energy input to the middle atmosphere and heating of the thermal plasma. The dissipation processes of magnetospheric electrons in the upper atmosphere is also affiliated with cascading of higher energy electrons toward thermal energies and the production of secondary electrons. These lower energy electrons can escape back to the magnetosphere, encounter pitch angle scattering processes, and become trapped on closed magnetic field lines. In this talk we provide a quantitative analysis of magnetosphere-ionosphere-atmosphere coupling processes in the electron diffuse aurora, focusing on the energy and particle interplay between the two magnetically conjugate ionospheres in the presence of electrostatic electron cyclotron harmonic waves observed by THEMIS.