Space Physics Seminar

Thursday, September 15, 2016

C·S·P

Is Diffuse Aurora Driven From Above or Below?

George Khazanov

Goddard Space Flight Center

Diffuse aurora accounts for about 75% of the auroral energy precipitating into the ionosphere, and its origin has recently been the subject of many discussions and publications. In the diffuse aurora, precipitating electrons, initially injected from the plasmasheet via wave-particle interaction (WPI) processes, degrade in the atmosphere toward lower energies and produce secondary electrons via impact ionization of the neutral atmosphere. These initially precipitating electrons of magnetospheric origin can also be additionally reflected back into the magnetosphere, by the two magnetically conjugated atmospheres, leading to a series of multiple reflections that can greatly influence the initially precipitating flux at the upper ionospheric boundary (700-800 km). The resultant population of secondary and primary electrons cascade toward lower energies and escape back to the magnetosphere. Escaping upward electrons traveling from the ionosphere can be trapped in the magnetosphere, as they travel inside the loss cone, via Coulomb collision with the cold plasma, or by their interactions with different kinds of plasma waves. Even though this scenario is quit obvious, this magnetosphe-ionosphere (MI) coupling element is completely missing in all existing diffuse aurora research, and, as we demonstrate in this report, has a dramatic effect on the formation of electron precipitated fluxes in the regions of diffuse auroras.

4:00pm in CAS 502. *Refreshments served at 3:45pm in CAS 500.*

BOSTON UNIVERSITY

Center for Space Physics
725 Commonwealth Avenue
617-353-5990
http://www.bu.edu/iar/seminars

Next Week

James O'Donoghue
Boston University CSP