



MI Coupling Processes in the Regions of Diffuse Aurora: Ionospheric Outlook

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The precipitation of high-energy magnetospheric electrons in the diffuse aurora contributes significant energy flux into the Earth's ionosphere. In the diffuse aurora, precipitating electrons initially injected from the plasma sheet via wave-particle interaction 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 be additionally reflected back into the magnetosphere, leading to a series of multiple reflections that can greatly influence the initially precipitating flux at the upper ionospheric boundary, the resultant population of secondary electrons, and electrons cascading toward lower energies. It is found that magnetosphere-ionosphere coupling is the key element in the formation of electron distribution function in the regions of diffuse aurora at ionospheric altitudes.