Low Energy Precipitating Electrons in the Diffuse Aurorae

For decades, there has been a peculiar category of precipitating electron spectra, as observed by the DMSP satellite, where the low-energy electron fluxes were too high to fit any of the spectra of the three well-known electron aurora categories: monoenergetic, diffuse, and broadband.

Comparison of the DMSP spectra with simulated ones from a state-of-the-art precipitation model (STET), revealed that the "non-conforming" low-energy electron population could be explained by the precipitation of the secondary electrons, which are created when the primary precipitating electrons from the magnetosphere, collide and ionize neutrals in the ionosphere.

High fluxes of low energy electrons observed by the DMSP can be attributed to the secondary electrons that bounce between the conjugate points in the ionosphere.