



Runaway electrons as current carriers in the ionosphere?

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Electrodynamic models predict large field aligned current densities on one side of the auroral arcs. These currents, which can reach up to hundreds of $\mu\text{A}/m^2$, are carried by thermal electrons. In the upper ionosphere (i.e. > 1500 km), recent satellite observations show that these return currents are carried by suprathermal electrons (> 10 eV). In the *F*-region, recent models suggest that suprathermal electrons of more than 1eV trigger the beam instability. We want to understand how a thermal electron population switch over to a suprathermal electron population. For this purpose, we developed a model that describes electron dynamics in a collisional plasma. The collisions are implemented with the Fokker-Planck equation. We apply this model to the ionospheric conditions. The aim of our study is to bring to light the appearance of runaway electrons.