AOGS 2006

Injection and Loss Processes of 30 to 300 KeV Particles and Relativistic Electrons During CIR and Non-CIR Storms.

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The injection of electrons and protons into the auroral andsubauroral zone is considered for a number of storms, some of which exhibit HILDCAA activity. The total energy flux of the ions into the midnight/evening quadrant gives a good estimate of the energy injection into the ring current. It is revealed that the HILDCAA events are associated with a low level injection of protons into the outer portion of the ring current. This injection, if in the recovery phase of a storm, prolongs the final decay of the Dst to quiet day values, and if it occurs in times without storms the injection can keep the Dst to a negative value more or less constant for days. The prolonged low level ion injection is associated with fluctuations in the B_z component of the solar wind magnetic field. During the recovery phase of some storms observations in and near the atmospheric loss cone reveal increased intensity of relativistic electrons. This region of enhanced loss of relativistic electrons closely match the region of anisotropic proton presipitation. This is a strong indicator that relativistic electrons are scattered into the atmospheric loss cone by electromagnetic ion cyclotron waves generated by the unstable protonpopulation. Ourfindings are in accord with the Thorne and Kennel (1971) theory that suggested that ion cyclotron waves generated by the unstable proton population can precipitate relativistic electrons in the $>$ 1 MeV range