

Solar-cycle variations of >30 keV electron flux enhancements under the inner radiation belt

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Intense fluxes of 30-300 electrons can arise in the equatorial ionosphere outside the South Atlantic Anomaly. It was established that the electrons were injected from the inner radiation belt probably due to a mechanism of fast radial transport in the crossed electric and magnetic fields. Continuous monitoring of energetic particles at low heights of ~850 km with the MEPED instrument onboard the NOAA/POES satellites allowed compiling large statistics of the >30 keV electron enhancements from 1998 to 2018. We studied particle flux variations with geomagnetic activity and solar cycle. We found that geomagnetic activity measured by Dst and AE indices are not key factors of occurrence rate increase for electron injections, but influence on intensity of particles. The occurrence rate is controlled by auroral conductivity on the dayside and significantly enhanced during northern summer. Descending phase of solar cycle plays a major role in the occurrence rate increase.

Keywords: magnetosphere-ionosphere, energetic electrons, low latitudes, solar cycle