Timing and timescale of relativistic electron enhancement in the slot region

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http://www.geo.titech.ac.jp/lab/nagai/nagai/rdm.html/

We present two event studies on significant enhancement of the relativistic electron flux in the slot region of the radiation belts during storms, using electron measurements by the spacecarft Akebono at high altitudes and NOAA 15, 16, 17, and 18 at low altitudes. The significant flux enhancement takes place in the main phase of storms, and it is a very rapid process with timescales of less than 50 minutes. The enhancement of the relativistic electrons (higher than 1 MeV) are accompanied with incraeses in lower energy (higher than 30 keV) electrons and protons in the same L region. The highly stretched and intensified magnetic field returns to the dipolar magnetic field for the onset of storm-time substorms. The flux enhancement is likely associated with this large change in the magnetic field and transient electric field. The present observations imply that strong acceleration and transport processes operate in the deep magnhetosphere in the main phase of storms.