Particle and field characteristics of twelve broadband electron events observed by the FAST satellite during geomagnetic storms

Akimitsu Nakajima[1]; Kazuo Shiokawa[1]; Kanako Seki[2]; Robert J. Strangeway[3]; James P. McFadden[4]; Charles W. Carlson[4]

[1] STELAB, Nagoya Univ.; [2] STEL, Nagoya Univ.; [3] IGPP, UCLA; [4] SSL, UC Berkeley

Broadband electrons are remarkable flux enhancements of precipitating electrons over a broad energy range (50 eV-30 keV) near the equatorward edge of the auroral oval during geomagnetic storms. We identified twelve broadband electron events from the electron energy spectra obtained by FAST during 81 geomagnetic storms between September 1996 and March 2004. Broadband electrons are observed at 53^o-65^o ILAT with latitudinal widths of 1^o-6^o. Ground-based magnetic field data show that the broadband electrons tend to occur after the onset of substorm (˜5-38 min) during the main phase of geomagnetic storms. During broadband electron events, pitch angle distribution is isotropic except for a loss-cone feature around the field-aligned upward direction at a higher energy range above ˜1 keV. At a lower energy range below ˜1 keV, field-aligned electron fluxes are most intense and the perpendicular fluxes are weakest. Intense fluctuations of electric and magnetic field and enhanced low-frequency (0-10kHz) waves are also observed during these events. These characteristics are common for all broadband electron events. In the presentation, we also make comparison between total particle flux and Poynting flux during broadband electron events.