POST STORM TRAPPED ENERGETIC ELECTRON FLUX ENHANCEMENT AND DECAY

J. F. FENNELL[1], S. Kanekal[2], and J. L. Roeder[1]

(1) The Aerospace Corporation, Los Angles, CA
(2) University of Colorado, Boulder, CO

Energetic electron observations from HEO and SAMPEX satellites were used to study the electron response to several magnetic storms in the inner magnetosphere with emphasis on the post storm flux increases and subsequent decays. The observations were taken during the1998 – 2007 and 1992 – 2005 periods for HEO and SAMPEX respectively. The HEO observations cover $1.75 \leq L \leq 6$ for electrons with energies from >130 keV to >3 MeV. The SAMPEX observations cover the $1.5 \leq L \leq 6$ for Ee ≥2 MeV. For this presentation we focus on the post storm observations of the electron flux rise and decays obtained at L = 3, near the flux peak of the outer zone. The >1.5 MeV electron fluxes were found to have three distinct 1/e decay times of ~6, 12, and 20 days. The 6 and 12 day 1/e decay times occurred in the first several days after the fluxes peaked, occurring during 2000–2001 and 1998 periods, respectively. The longer 1/e decay times of ~20 days occurred late in the post storm decay history. The flux decay times obtained from SAMPEX and HEO3 for a subset of the storms compared relatively well but the HEO3 energy that compared best (>0.63 MeV) was lower than expected. The energy dependence of the decay times was examined for the HEO3 data. The >630 keV electron decay times compared well with those of the >450 keV and >1.5 MeV electrons for $2.75<L<4$. The >3 MeV decay times were longer than those at lower energies. The times for the post main phase flux enhancements will also be presented. At times, the >3 MeV enhancements at lower L values could be delayed several days relative to those at lower energies. The enhancement and decay time frames will be discussed in terms of the transport and loss processes.

Geomagnetic Storms, Radiation Belts, Electrons

J. F. Fennell, POBox 92957, Los Angeles, CA 90009