



Storm-time Observations of Adiabatically-Scaled GOES electrons

Jennifer Gannon (1), Scot Elkington (2), and Terry Onsager (3)

(1) USGS Geomagnetism Program, Denver, CO, USA (jgannon@usgs.gov), (2) Laboratory for Atmospheric and Space Physics, Boulder, CO, USA, (3) Space Weather Prediction Center, Boulder, CO, USA

Electron populations in the Earth's radiation belts are subject to many energization and loss processes due to geomagnetic activity. Because satellites are often at fixed energy, they observe particle populations at changing values of the adiabatic invariants, which can result in observational increases and decreases in flux level. We scale geosynchronous phase space densities from GOES satellites for a period encompassing nearly a solar cycle (1995-2006) to a constant value of the first invariant, based on measured energy spectra and magnetic field strengths. We identify changes in the radiation environment during geomagnetic storms using these scaled values and show somewhat different results than previous efforts using unscaled phase space densities do, with relatively more storms showing an increase in phase space density than a decrease. We also observe several examples of sudden energetic electron enhancements during storm main phase, in contrast to the slow recovery phase increases suggested by previous studies using unscaled phase space densities.