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Observations of energetic electrons far upstream of the Earth's bow–shock at COSTEP/SOHO

A. Klassen (1), R. Gómez-Herrero (1), E. Böhm (1), R. Müller-Mellin (1), B. Heber (1), and R. Wimmer-Schweingruber (1)

University of Kiel (klassen@physik.uni-kiel.de)

We have analyzed 153 electron bursts at energies above 0.25 MeV observed with the EPHIN/COSTEP instrument onboard the SOHO spacecraft far upstream of the Earth's bow–shock from 1996 through 2006. Most of the bursts were observed during low solar activity (in 1996–1997 and in 2005–2006) and all bursts were not associated with solar particle events.

We found that the event occurrence number shows a distinct seasonal variation with maxima around equinoxes and minima near solstices. This together with a close correspondence between the event occurrence number with maxima in solar wind speed (V_{sw}), geomagnetic activity index (A_p) and in the southward interplanetary magnetic field (IMF) component (B_z) indicates that the observed events can be explained in terms of leakage of magnetospheric particles during enhanced geoactivity rather than as acceleration at the Earth's bow–shock.