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The Energy Spectrum of Jovian Electrons in Interplanetary Space

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In this paper we report on the energy spectrum of electrons with energies ~ 10 to ~ 180 MeV measured with the electron telescope on the Voyager 1 and 2 spacecraft [*Stone et al*, 1977] in interplanetary space from 1978 to 1983   The kinetic energy of electrons is determined by double dE/dx measurements from the first two detectors (D_1, D_2) of a stack of eight solid state detectors and by the range of particle penetration into the remaining six detectors (D_3 to D_8) which are interleaved with tungsten absorbers

From 1978 to 1983 (radial range ~ 2 to ~ 12 AU) electrons of jovian origin were clearly observable for electrons stopping in D_3 ($E \geq 4$ MeV) and in D_4 ($E \geq 8$ MeV). For electrons stopping in D_5 ($E \geq 12$ MeV), the jovian flux dominated the galactic electron flux for a period of approximately one year near the encounter with Jupiter [*Christon et al*, 1985]. Jovian electrons were also observed in D_6 ($E \geq 21$ MeV) but not in D_7 ($E \geq 28$ MeV)   A detailed interpretation of the electron variations in all energy channels depends on an accurate subtraction of background induced by energetic protons of a few 100 MeV   This subtraction is facilitated by laboratory calibration results at several energies   Further results on the differential energy spectrum of jovian electrons and limits on the maximum detected energies will be reported.

References

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