



Space Environment Information System (SPENVIS)

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SPENVIS is an ESA operational software developed and maintained at BIRA-IASB since 1996. It provides standardized access to most of the recent models of the hazardous space environment, through a user-friendly Web interface (<http://www.spennis.oma.be/>). The system allows spacecraft engineers to perform a rapid analysis of environmental problems related to natural radiation belts, solar energetic particles, cosmic rays, plasmas, gases, magnetic fields and micro-particles. Various reporting and graphical utilities and extensive help facilities are included to allow engineers with relatively little familiarity to produce reliable results. SPENVIS also contains an active, integrated version of the ECSS Space Environment Standard and access to in-flight data on the space environment. Although SPENVIS in the first place is designed to help spacecraft engineers, it is also used by technical universities in their educational programs. At present more than 4000 users are registered.

With SPENVIS, one can generate a spacecraft trajectory or a coordinate grid and then calculate: geomagnetic coordinates; trapped proton and electron fluxes; solar proton fluences; cosmic ray fluxes; radiation doses (ionising and non-ionising) for simple geometries; a sectoring analysis for dose calculations in more complex geometries; damage equivalent fluences for Si, GaAs and multi-junction solar cells; Geant4 Monte Carlo analysis for doses and pulse height rates in planar and spherical shields; ion LET and flux spectra and single event upset rates; trapped proton flux anisotropy; atmospheric and ionospheric densities and temperatures; atomic oxygen erosion depths; surface and internal charging characteristics; solar array current collections and power losses; wall damage. The new version of SPENVIS (to be released in January 2009) also allows mission analysis for Mars and Jupiter.