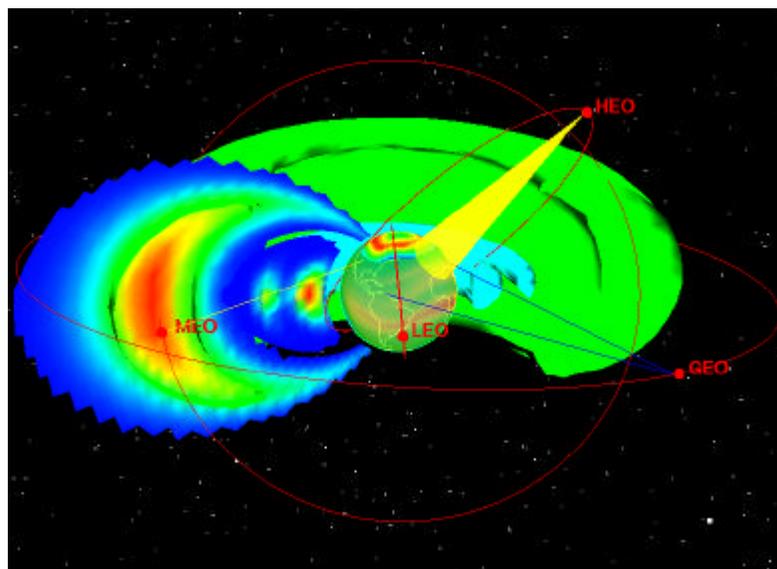


Tests and Guidelines for Spacecraft Cable Charging and Discharging Under High Energy Electron Flux

E9



Objective

This investigation will provide quantitative data and design guidelines for charging and discharging of spacecraft cables under high energy electron irradiation typical of Earth's and Jupiter's magnetospheres. This investigation supports NASA's spacecraft technology program, especially future missions to Jupiter and Europa and missions to planet Earth, as well as missions with temporary parking orbits or booster orbits. This work becomes critical as more sensitive and lower voltage integrated circuits and commercial-off-the-shelf (COTS) electronics are attached to cables and inserted into future space programs.

Why Needed

Spacecraft cables have been shown to be a major source of spacecraft anomalies. Evidence indicates that a significant proportion of spacecraft anomalies that occur in the electron radiation belts are caused by discharges on irradiated electrical cables. No guidelines exist that tell how an untested cable will respond, or how any cable will respond if small changes are made to the cable or to the radiation environment.

Point of Contact

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Sponsor

NASA Space Environments and Effects (SEE) Program