

Abstract (*paper not available*)

Simulated Space Plasma Surface Charging Study of Various Spacecraft Dielectric Materials and Coatings

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Plasma-induced surface charging and electrostatic discharges are studied for a variety of commonly used spacecraft and launch vehicle dielectric materials and surface coatings. A plasma charging current is generated in a vacuum chamber using an electron beam generated by a commercial electron gun, designed for spacecraft surface charging measurements. All materials tested are backed by a grounded metal plate, through which the surface potential is be measured using an electrometer circuit, and electrostatic discharge currents are measured with a high-speed oscilloscope current probe. The environments simulated include the NASA-HDBK-4002a worst case defined environment which utilizes a 1nA/cm² 20keV electron beam, as well as an auroral-type environment which is simulated with a higher density background plasma in addition to the electron beam that is used to mimic electron precipitation in the geomagnetic poles.
