

Development of information system of spacecraft surface charging potential and discharging alert

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Spacecrafts can be damaged by surface charging and resultant discharging arcs. We are developing information system of surface charging potential and discharging alert for individual spacecraft. We create lookup tables of surface potential for many combinations of plasma temperatures and densities using charging simulation for the spacecraft engineering model with a spacecraft charging analysis software and/or spacecraft observational results. Using interpolation with the lookup tables, we can estimate surface potential on demand for any given on-orbit plasma environment. The discharging alert also can be accomplished by additional information about the estimated differential potential and the experimental discharge potential of the spacecraft. We will introduce current status of our system.

Keywords: Spacecraft surface charging, Spacecraft discharging alert, Space weather