

Abstract (paper not available)

Effect of Atmosphere Exposition, Storage and Cleaning Procedure on Electron Emission and Charging Properties

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Electron emission properties under electron, photon or proton radiations play a leading role in spacecraft charging processes. Secondary electrons as well as photoelectrons are highly depending on the surface and the first nanometres subsurface. Technical materials, i.e. materials used in spacecraft technologies, are ordinarily exposed to atmosphere, which thus interacts with their surface. The inevitable contamination layer building up at the surface of the materials and/or the oxidation layer, dramatically affect/affects electron emission properties and therefore the charging level. For instance the maximum of the electron yield of pure aluminium is lower than 1, however when its surface is exposed, even very shortly, to atmosphere (a few seconds) the yield's maximum increases to 3. In this conference, starting from two samples (a dielectric and a metal), exposed for more than one month to ambient atmosphere, the variations of electron emission, charging properties and surface composition under ultrahigh vacuum conditions were monitored in-situ for: (i) As received samples (ii) Heated to 150°C samples (iii) Argon cleaned samples It was shown that the electron emission properties as well as the surface potential are highly depending on the cleaning procedure. In the light of the presented results, the representativeness of ground measurements test on electron emission as well as on charging properties is discussed.
