

Abstract Submitted
for the 4CF09 Meeting of
The American Physical Society

The Effects of Surface Contamination and Roughening on Diffuse Optical Reflection and Photoyields of Spacecraft Materials¹ AMBERLY EVANS, J.R. DENNISON, Utah State University — Modification of a material's surface affects the optical properties (reflection, transmission and absorption) and charge accumulation of that material. This project has been designed to study the properties of Kapton HN and gold and the affects that surface modification (roughening and contamination) have on them. Samples of each material were roughened with varying sizes of roughening compounds or contaminated with diffusion pump oil. Reflectivity and transmission measurements were compared for all samples. It is evident that modifying the surface changes the reflectance, implying a change in absorbance. Absorbed photons can contribute to charge accumulation in materials through photoemission, whereas reflected and transmitted photons do not. However, reflection and transmission are readily measured and can be related to absorbance. In the harsh space environment, materials are going to be damaged and contaminated, affecting the optical properties of the material and, in turn, charge accumulation. Understanding absorbance and charge accumulation is important in spacecraft construction because charging can inflict serious damage on spacecraft.

¹USU Eccles Fellowship

Amberly Evans
Utah State University

Date submitted: 29 Sep 2009

Electronic form version 1.4