Abstract Submitted
for the SES05 Meeting of
The American Physical Society

Thin film surface treatments for lowering dust adhesion and ultraviolet degradation of Mars Exploration Rover calibration targets FIROUZEH SABRI, RANDOLPH DURAN, University of Florida, TIM WERHNER, DAN BRITT, University of Central Florida — The correct interpretation and radiometric modeling of images received from the Panoramic Camera, on board Mars Exploration Rover relies on precise color calibration. An imperative property of the calibration targets is that their surfaces must follow Lambert's Cosine law of reflection. This translates into surface heterogeneities that can act as trapping sites for the micrometer-size dust particles present in Mars atmosphere, caused by frequent dust storms. The tacky nature of the polymer that is currently in use (RTV655) adds to the dust accumulation and adhesion problem. In addition, the polymer undergoes chemical changes when exposed to intense UV radiation existent on Mars. As a result, significant degradation of optical resolution is observed. However, properties of RTV655 such as toughness, flexibility, low outgassing, and wide range temperature stability are superior to other materials available. Therefore, our approach towards eliminating these problems has been to maintain the original design structure yet apply non-invasive thin film technology consisting of a polymer-metal sandwich structure that would create a smooth and transparent finish with inert chemical properties.

Firouzeh Sabri
University of Florida

Date submitted: 09 Aug 2005 Electronic form version 1.4