

IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
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NASA, United StatesELECTRODYNAMIC DUST SHIELD TESTING ON THE MATERIALS ON INTERNATIONAL
SPACE STATION EXPERIMENT 11**Abstract**

Dust is a major concern for lunar exploration. To combat the effects of dust, NASA, academia, and industry are developing solutions to the dust problem. One potential technology solution for this problem is the Electrodynamic Dust Shield (EDS). The EDS uses electrostatic and dielectrophoretic forces to walk particles off of surfaces through a series of high voltage pulses. This technology can be applied to camera lenses, viewports, thermal radiators, and other systems that must be kept free of lunar dust. The EDS is currently being tested on the Materials on International Space Station Experiment (MISSE) platform as a technology demonstration in preparation for future lunar exploration missions. The MISSE Flight Facility (MISSE-FF) provides a long term space exposure platform to verify compatibility of materials and manufacturing processes to the space environment. The MISSE-11 EDS experiment consists of 12 EDS panels. These panels are made of glass, polyimide, or prototype spacesuit fabric. Some panels are covered with a lotus leaf coating while others are covered with thermal paint. They are flown in the wake position of the ISS to simulate the lunar environment. Two panels are in an active configuration and are energized with a high voltage power supply, which generates high-voltage pulses multiple times per day. Current and voltage data are recovered from each of these trials to compare to baseline data. Also, each of the EDS panels are imaged on a monthly basis to track any changes with time that may occur with the EDS variants. In this paper, we report preliminary data and analysis from this spaceflight experiment. The on-orbit data is compared to the ground-based experimental control data.