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Launch and Deployment of the MISSE-6 Payload: State of Utah Space Environment & Contamination Study (SUSpECS)

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Launch and Deployment Activities

SUSpECS Objectives
- Basic research extends our understanding of the materials/environment interactions.
- Specific knowledge is gained for critical materials in several on-going projects of the team members.
- Valuable collaborations between team members are fostered.
- Analysis capabilities and flight experience are followed up for post-flight analysis of the SUSpECS sample set, but for other joint ventures involving reliability and aging of materials in the space environment.

Integration of SUSpECS in to MISSE-6

The Double Stack will also investigate isolation by atomic oxygen and the effects that shadowing have on atomic oxygen exposure. Below: Measuring the mass erosion rate of Kapton due to atomic oxygen radiation degradation has long been the standard in determining how much atomic oxygen a surface has been exposed to. Above: Double Stack Ag foils will be evaluated as an accurate AO fluence monitor sensor and calibrated against Kapton sensors. This study will also address the effects caused by shadowing and the possibilities of ballistic scattering of atomic oxygen.

SUSpECS Material Samples List

Scientific Solutions Inc has technology that uses nematic liquid crystal as the tuning medium in Fabry-Perot interferometers. The liquid Crystal Fabry Perot (LCFP) has passed temperature and vibration testing, but the final test will be to see if it can withstand the atmosphere of lower earth orbit (LEO).

Wake Side

Wake Sample Holder SUSpECS Electrical
Grounded Guard Plate
+5 VDC
-5 VDC
-15 VDC
Approximately 125 samples are mounted on three 5 cm by 15 cm panels on both the ram (75) and wake (50) sides of the ISS. They have been carefully chosen to provide needed information for a broad cross section of prototypical materials used on the exteriors of spacecrafts. (See Below) The materials will be tested for electron-, ion-, and photon-induced electron emission yield curves and emission spectra. Characterization measurements include electron microscopy, reflectometry, reactivity and Auger electron spectroscopy.

Passive UV Exposure
25 Grounded Samples 10 Conductor samples