STATEMENT OF WORK
An existing model to predict the optical properties (solar absorptance and thermal emissivity) of thermal control surfaces in terms of exposure to solar vacuum ultraviolet (VUV) and contamination layer is known to overpredict. From first principles, this model could be updated to consider how fast the contamination layer goes down and how much VUV the surface gets. Also, the model could be updated to include the effect of atomic oxygen (AO -sometimes a bleaching effect, sometimes making things darker). The ultimate goal is to use the Materials on ISS Experiment (MISSE) data to update the model for the previously-mentioned effects as well as the type of coating, the method of application, and any overcoats. This updated model will assist ISS life extension. Also, previous discussions with the ISS Passive Thermal Control Systems (PTCS) team focused on a more standardized approach for beginning-of-life and end-of-life optical properties for their analyses. One such study with PTCS was previously done regarding improperly manufactured beta cloth. The techniques of that study could be expanded with assistance from the PTCS community.

PROJECT DESCRIPTION/OVERVIEW
The objective of this project will be to improve the optical properties model by correlation using MISSE data. The optical degradation model for solar absorptance was developed from Mir data (reference: S. Koontz and C. Soares, "External Spacecraft Contamination", NASA JSC-27644, 1996) and has been extended via hardware flown on ISS. Presently, the solar absorptance Model dependent on total Equivalent Sun Hours (ESH) from Vacuum Ultraviolet (VUV); the thickness of the contamination layer; and the Beginning-of-Life (BOL) solar absorptance. Presently, atomic oxygen erosion issues are not included the model, but data exists for such an extension.