

Infrared Studies of the Reflective Properties of Solar Cells and the HS376 Spacecraft

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In 2015, a selection of HS-376 buses were observed photometrically with the United Kingdom Infrared Telescope (UKIRT) to explore relationships between time-on-orbit and Near Infrared (NIR) color. These buses were chosen because of their relatively simple shape, for the abundance of similar observable targets, and their surface material being primarily covered by solar cells. While the HS-376 spacecraft were all very similar in design, differences in the specific solar cells used in the construction of each model proved to be an unconstrained variable that could affect the observed reflective properties.

In 2016, samples of the solar cells used on various models of HS-376 spacecraft were obtained from Boeing and were analyzed in the Optical Measurements Center at the Johnson Space Center using a visible-near infrared field spectrometer. The laboratory-based spectra are convolved to match the photometric bands previously obtained using UKIRT and compared with the on-orbit photometry. The results and future work are discussed here.