

Solar Sail Models and Test Measurements Correspondence for Validation Requirements Definition

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Solar sails are being developed as a mission-enabling technology in support of future science missions such as Solar Polar Imager, Particle Acceleration Solar Orbiter, and L1 Diamond. Current advances made under the In-Space Propulsion Technology (ISPT) program have sufficiently progressed the technology far enough to go to the next step, flight validation. To be conducted under the New Millennium Program (ST9), flight validation will reduce the risk (*i.e.*, increase TRL) associated with solar sail technology. A primary objective is to test and validate solar sail models that are currently under development so that they may be used with confidence in future science mission development (*e.g.*, scalable to larger sails). Validation requirements must be defined early in the program to ensure that relevant and sufficient flight test data is obtained to conduct model validation to the level required. This requires a correspondence or mapping between the inputs and outputs of each model to the test measurement data. The resulting matrix will define the tradeoff variable space between what the modelers would need for complete validation and what the hardware (and budget) can deliver.