

STEREO IMPACT IDPU FM2 Mass Properties Report

Document # IMP-626-DOC

Revision: --

Written By: Jeremy McCauley

Reviewed By: Dave Curtis

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On May 19, 2005, the mass properties of the STEREO IMPACT IDPU FM2 were measured. Mass properties were determined for the IDPU without any connector savers or blankets or bagging material attached. The Kapton tape on the top (+Z) surface of the IDPU was in place.

Mass Measurements were made upon a scale with one gram resolution. CG measurements were made with a scale having a 1 mm resolution, though uncertainties in the method are probably closer to 2 mm. MOI calculations are determined from three subsequent measurements of the period of oscillation of a torsional pendulum; all repeated measurements were within .01 seconds per oscillation.

The following results were determined from the measurements.

Mass: 1.858 kg

CG: X, Y, Z = 95 mm, 78 mm, 31 mm

MOI: $I_{xx} = 0.011 \text{ kg m}^2$

$I_{yy} = 0.005 \text{ kg m}^2$

$I_{zz} = 0.008 \text{ kg m}^2$

Table 1: MOI Spreadsheet

Item	Axis	# osc. cyc	time(s)	Tau	Tors Sprg K (kg/m)	I/K	Mass (kg)	Radius (m)	I (kg-m ²)
Calibration Mass (assumed to be Cylinder)	(Izz)						3.516	0.0508	0.00453
Calibration Mass +Table Mass Inertia Measurements	(Izz)	10	19.60						
		10	19.6	1.960	0.7	0.09731			
Bare Table Inertia Measurements	(Izz)	10	18.95						
		10	18.945	1.895		0.0909			0.064
Unit number	Ixx	30	61.34	2.045		Mass =	1.863		0.011
	Iyy	30	59.09	1.970			1.863		0.005
	Izz	30	60.4	2.013			1.863		0.008

