

## **Ancillary Data**

This data set contains the Peter Thomas shape model for Saturn's satellite Epimetheus (Saturn XI,) based on optical data from the Cassini Imaging Science Subsystem (ISS) Narrow-Angle Camera (NAC) instrument. The current version of this data set contains the following shape model file:

Epimetheus\_30k\_plt.tab

This shape model file also has a detached label file, with a suffix of .xml, which describes the format and content. The shape model is in a plate model format and only represents the model shape, with no gravity or slope information.

## **Coordinate System**

+X is Saturn-facing; + Y is opposite the direction of orbital motion; +Z is along the positive rotation axis. Because of orbital eccentricity, the x-axis deviates slightly from perfect Saturn alignment around the orbit; these small deviations are accounted for in the rotation model used, in addition to forced libration (Tiscareno et al. 2009).

The rotational model used in construction of this model is a binary kernel: epimetheus\_mst2013.bpc prepared by M. S. Tiscareno, and available through the Navigation and Ancillary Information Facility (NAIF).

For information on using SPICE kernels, please see pck\_req.txt - "PCK Required Reading", PCK required reading document, last revised on 2009 Apr 15 by B.V. Semenov.

## **Confidence Level Notes**

Images used and their associated viewing geometries are listed in Table 1 below. Uncertainties in the shape model have been based on pixel scale and spatial density and solution residuals of control points.

Likely uncertainty of model radii for Epimetheus range from 0.15 to 0.3 km, portions of the south polar region are the most uncertain.

## **Limitations**

The shape model is intended for global geometric, geologic, and geophysical studies. The morphology of small craters is not reliably included; some relatively large craters can show approximate measures such as depth/diameter. Regional slopes can be calculated to accuracies estimated by the listed uncertainties.

## **Acknowledgements**

The following people helped in the development of the software and/or models during the Cassini mission: Beatrice Mueller and Conor Kingston for direct assistance in formatting and submitting the data sets, Brian Carcich for software development used to derive the shape models, Matt Tiscareno for preparing small body kernels that improved the accuracy of the models, Mike Evans for assistance in modifying the plate model format to meet PDS Requirements, Chuck Acton for assistance in archiving kernels, Pam Smith for data management.

**Table 1. Cassini ISS Images used for Epimetheus shape model**

Filter: filters used in each filter wheel. CL: clear; UV: ultraviolet; VIO: violet; BL: blue; GRN: green; MT: methane; RED: red; CB: methane continuum; IR: infrared; P: polarization. Details of filter bandpasses and use in Porco et al. (2004).

SC lat lon: Sub spacecraft position in degrees. Lon is West longitude where 90°W is the leading point.

Solar lat lon: sub solar position in degrees

Range: distance to object center from spacecraft, km

Noraz: image orientation of the projected object spin axis, degrees clockwise from up.

Samp: object center x-coordinate in image 0 is at left of image in pixels

Line: object center y-coordinate in image; 0 is at top of image in pixels

Phase: solar phase angle at center of image in degrees.

Images used in construction of model of EPIMETHEUS:

Image	filt	filt	S/C		Solar		range	noraz	samp	line	phase
			lat	lon	lat	lon					
N1490836693_1	BL1	CL2	-0.55	204.04	-21.84	321.37	74067.0	19.73	512.90	61.60	115.00
N1490836766_1	CL1	IR1	-0.55	204.24	-21.84	321.79	74407.0	19.75	510.80	158.30	115.20
N1490836833_1	P0	GRN	-0.54	204.43	-21.84	322.18	74721.2	19.74	511.00	245.30	115.38
N1490836866_1	P60	GRN	-0.54	204.52	-21.84	322.36	74878.1	19.79	507.80	290.00	115.47
N1490836932_1	RED	CL2	-0.54	204.70	-21.84	322.74	75196.5	19.85	508.90	379.80	115.65
N1500071960_1	CL1	CL2	34.15	223.06	-21.20	304.32	87381.3	233.37	533.40	542.90	94.92
N1500072000_1	P0	GRN	34.25	223.23	-21.20	304.56	87536.5	233.42	543.40	540.00	95.01
N1500072040_1	P60	GRN	34.34	223.41	-21.20	304.84	87702.8	233.33	548.20	540.10	95.12
N1500072080_1	P120	GRN	34.44	223.59	-21.20	305.10	87868.4	233.28	557.60	542.00	95.22
N1575363079_1	CL1	CL2	-40.22	97.46	-9.53	31.44	37178.9	180.27	482.80	564.30	65.61
N1575363109_1	CL1	UV3	-40.21	97.53	-9.53	31.60	37360.5	180.21	483.00	564.60	65.54
N1575363139_1	CL1	CL2	-40.20	97.61	-9.53	31.77	37552.1	180.66	480.60	563.60	65.47
N1575363169_1	CL1	IR1	-40.19	97.68	-9.54	31.93	37738.6	180.30	475.50	562.30	65.39
N1575363199_1	CL1	IR3	-40.18	97.76	-9.54	32.10	37919.0	180.23	474.60	565.10	65.33
N1575363431_1	P0	GRN	-40.10	98.41	-9.53	33.40	39346.9	180.47	473.10	561.00	64.83
N1575363491_1	P120	GRN	-40.07	98.57	-9.54	33.73	39720.1	180.32	474.20	567.60	64.69
N1575363980_1	RED	GRN	-39.89	100.14	-9.54	36.44	42667.0	180.58	473.80	560.30	63.80
N1575364040_1	IR2	IR1	-39.88	100.36	-9.54	36.77	43014.5	180.13	470.40	561.00	63.71
N1575364070_1	IR2	IR3	-39.86	100.46	-9.54	36.94	43196.3	180.12	470.10	564.10	63.66
N1575364152_1	CL1	MT3	-39.83	100.75	-9.54	37.39	43677.4	180.24	467.10	563.40	63.53
N1649345705_1	CL1	CL2	-1.80	209.55	3.45	140.24	86631.1	153.63	575.00	589.50	69.48
N1649345738_1	CL1	GRN	-1.79	209.67	3.45	140.45	86850.6	153.56	576.20	588.30	69.39
N1649345811_1	CL1	UV3	-1.78	209.92	3.45	140.91	87314.6	153.73	577.80	587.40	69.18
N1649348312_1	CL1	CL2	-1.43	219.24	3.45	157.22	106995.3	153.94	562.60	589.40	62.18
N1828122257_1	CL1	CL2	3.52	225.52	25.31	206.92	37836.7	180.07	411.50	524.40	28.19
N1828122367_1	CL1	GRN	3.52	226.25	25.30	207.52	37235.3	180.07	410.30	524.80	28.26
N1828122423_1	BL1	CL2	3.53	226.62	25.31	207.82	36933.3	180.29	409.90	525.40	28.30
N1828122595_1	P60	GRN	3.53	227.75	25.31	208.75	36000.0	180.07	405.70	523.60	28.42
N1828122657_1	P120	GRN	3.53	228.16	25.30	209.09	35665.4	180.07	407.30	526.10	28.46
N1828122742_1	CL1	UV3	3.54	228.66	25.31	209.51	35251.0	180.04	404.80	525.70	28.51
N1828124037_1	CL1	CL2	3.54	236.68	25.31	216.59	28382.5	180.08	402.00	531.80	29.10
N1828124092_1	RED	CL2	3.54	237.00	25.31	216.89	28097.5	180.01	404.00	529.30	29.11
N1828124265_1	CL1	IR3	3.53	237.96	25.30	217.81	27206.1	180.05	398.20	530.40	29.14
N1828124382_1	P60	GRN	3.53	238.62	25.31	218.45	26596.3	180.07	394.80	525.60	29.16
N1828124444_1	P120	GRN	3.53	238.96	25.31	218.79	26274.8	180.08	396.50	528.70	29.16
N1864500586_1	CL1	CL2	72.62	69.88	27.03	171.32	93632.9	340.93	506.30	437.30	67.61
N1864501288_1	CL1	CL2	72.83	72.76	27.03	175.95	80812.9	339.39	487.60	424.40	68.03
N1864502081_1	CL1	UV3	73.18	75.73	27.03	181.18	65951.8	337.20	481.00	405.90	68.51
N1864502136_1	CL1	GRN	73.21	75.92	27.03	181.55	64888.8	337.41	481.10	403.50	68.55
N1864502390_1	P120	UV3	73.37	76.69	27.03	183.21	60110.0	336.52	487.70	398.50	68.72
N1864502766_1	CL1	CL2	73.66	77.63	27.03	185.73	52781.7	335.26	493.00	381.40	69.01
N1864504186_1	CL1	CL2	75.78	71.77	27.03	195.09	24904.3	322.03	478.20	212.50	71.32
N1864504226_1	CL1	UV3	75.87	71.00	27.03	195.36	24138.3	321.12	477.30	232.90	71.46
N1864504259_1	CL1	GRN	75.95	70.26	27.03	195.59	23462.8	320.27	476.80	224.20	71.59
N1864504603_1	CL1	CL2	76.69	57.32	27.03	197.86	16683.5	306.55	465.70	110.70	73.51
N1864504671_1	CL1	CL2	76.72	52.95	27.03	198.30	15353.1	302.12	685.50	889.50	74.10
N1864504704_1	CL1	UV3	76.70	50.59	27.03	198.51	14728.1	299.79	687.80	889.50	74.42
N1864505170_1	CL1	CL2	63.52	355.28	27.03	201.58	6076.5	246.88	430.10	-603.60	87.09
N1866365558_1	CL1	CL2	82.26	339.11	26.90	191.60	21025.5	59.55	532.50	910.00	69.70
N1866365699_1	CL1	GRN	79.76	325.17	26.90	192.51	18446.4	46.07	552.20	812.40	70.26
N1866365809_1	CL1	UV3	76.89	317.25	26.90	193.23	16502.8	38.78	568.80	744.60	70.88

N1866365919_1	CL1	IR3	72.97	311.29	26.90	193.95	14607.2	33.72	589.70	681.90	71.78
N1866366029_1	CL1	CL2	67.71	306.88	26.90	194.68	12812.6	30.56	614.70	619.50	73.09
N1866366139_1	CL1	GRN	60.73	303.61	26.90	195.40	11182.7	28.93	645.70	556.50	75.02
N1866366469_1	CL1	CL2	24.94	297.93	26.90	197.56	8158.0	28.64	993.70	877.20	87.41
N1866366529_1	CL1	CL2	16.46	297.33	26.90	197.95	8089.5	28.45	1042.90	766.90	90.64
N1866366589_1	CL1	CL2	8.01	296.82	26.90	198.35	8201.2	27.59	1083.30	644.10	93.84
N1866366649_1	CL1	CL2	-0.04	296.39	26.91	198.74	8485.8	27.19	1107.40	526.10	96.84
N1866366709_1	CL1	GRN	-7.41	296.04	26.90	199.13	8926.0	26.31	1114.70	415.30	99.48
N1866366840_1	CL1	IR3	-20.71	295.47	26.90	199.99	10317.9	23.78	1080.60	235.50	103.87
N1866366879_1	CL1	CL2	-24.01	295.34	26.90	200.25	10833.3	23.13	1062.50	198.00	104.85
N1866366919_1	CL1	GRN	-27.02	295.24	26.90	200.52	11384.3	22.60	1043.50	167.50	105.72
N1866366996_1	CL1	UV3	-31.97	295.08	26.90	201.00	12507.9	21.59	1003.70	129.10	107.06
N1866367060_1	CL1	IR3	-35.52	295.00	26.90	201.43	13526.5	20.76	970.70	110.20	107.94
N1866367129_1	CL1	CL2	-38.77	294.96	26.90	201.89	14676.1	19.96	934.90	93.30	108.70
N1866367199_1	CL1	GRN	-41.55	294.95	26.90	202.35	15869.0	19.49	904.90	87.60	109.29
N1866367276_1	CL1	UV3	-44.12	294.99	26.90	202.85	17195.6	18.78	873.30	85.60	109.81
N1866367340_1	CL1	IR3	-46.01	295.05	26.90	203.27	18354.4	18.33	850.20	87.30	110.17
N1866367400_1	CL1	CL2	-47.59	295.13	26.90	203.68	19460.1	17.95	830.40	86.80	110.44