

## **Ancillary Data**

This data set contains the Peter Thomas shape model for Saturn's satellite Atlas (Saturn XV), 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:

atlas\_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.

The rotational model used in construction of this model is a binary kernel: atlas\_mst2018.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 Atlas range from 0.1 to 0.3 km; the south polar region is 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 Atlas shape model**

Filt: 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 ATLAS:

			S/C		Sun						
	filt	filt	lat	lon	lat	lon	range	noraz	samp	line	phase
N1496909886	RED	CL2	-4.61	249.50	-21.45	288.42	162467.0	269.92	508.30	582.40	41.31
N1496909975	CL1	GRN	-4.41	249.99	-21.45	289.03	162731.0	269.92	507.60	580.90	41.51
N1530369671	CL1	CL2	-0.35	95.04	-16.87	141.23	288133.4	359.91	515.40	519.50	48.38
N1530370251	CL1	CL2	-0.35	97.80	-16.87	145.25	282703.6	359.91	514.90	520.20	49.54
N1530370541	CL1	CL2	-0.35	99.21	-16.87	147.26	280020.3	359.91	516.80	518.50	50.10
N1530370686	CL1	CL2	-0.35	99.92	-16.87	148.26	278690.1	359.91	514.70	519.80	50.37
N1560303384	CL1	UV3	-51.11	164.80	-12.06	58.25	41684.0	341.37	520.80	528.80	90.70
N1560303424	CL1	UV3	-51.28	164.79	-12.06	58.54	41856.1	341.48	526.60	529.20	90.47
N1560303457	CL1	GRN	-51.43	164.78	-12.06	58.79	42008.1	341.58	528.90	528.10	90.26
N1560303490	CL1	GRN	-51.57	164.76	-12.06	59.00	42151.6	341.73	376.70	596.60	90.08
N1560303523	BL1	CL2	-51.70	164.75	-12.06	59.23	42294.7	341.76	534.90	531.20	89.90
N1560303556	BL1	CL2	-51.84	164.74	-12.06	59.45	42439.6	341.91	378.60	599.20	89.72
N1560303589	RED	CL2	-51.97	164.74	-12.06	59.70	42586.5	342.01	375.20	594.90	89.53
N1560303622	RED	CL2	-52.10	164.73	-12.06	59.92	42732.8	342.10	375.20	596.30	89.35
N1560303655	CL1	IR1	-52.22	164.72	-12.06	60.15	42879.7	342.14	538.70	529.30	89.17
N1560303688	CL1	IR1	-52.35	164.72	-12.06	60.38	43027.4	342.23	539.00	527.10	89.00
N1560303721	CL1	IR3	-52.48	164.81	-12.06	60.60	43169.1	342.31	537.90	529.10	88.88
N1560303754	CL1	IR3	-52.60	164.80	-12.06	60.82	43316.4	342.40	531.00	514.50	88.71
N1560303787	CL1	CL2	-52.71	164.70	-12.06	61.06	43474.6	342.51	539.60	528.20	88.48
N1560303820	CL1	CL2	-52.83	164.80	-12.06	61.29	43619.3	342.59	542.10	526.50	88.37
N1828131657	CL1	CL2	-3.66	213.63	25.59	269.64	23504.8	179.93	956.20	527.60	61.60
N1828131690	RED	CL2	-3.68	213.39	25.60	269.87	23588.6	179.92	959.50	526.50	62.01
N1828131756	BL1	CL2	-3.74	212.85	25.60	270.32	23745.5	179.92	846.70	529.80	62.89
N1828132956	BL1	CL2	-4.31	205.58	25.59	278.63	28113.4	179.92	939.90	525.70	76.72
N1828132989	CL1	IR1	-4.32	205.44	25.59	278.86	28268.8	179.92	947.40	523.20	77.05
N1828133023	P0	GRN	-4.32	205.30	25.59	279.10	28427.4	179.92	941.00	520.70	77.39
N1828133590	CL1	CL2	-4.39	203.29	25.60	283.02	31333.4	179.92	900.70	512.80	82.69
N1828133623	CL1	CL2	-4.39	203.21	25.60	283.25	31518.0	179.92	901.70	512.80	82.97
N1828133656	CL1	CL2	-4.39	203.11	25.60	283.48	31700.3	179.92	899.50	514.50	83.26
N1870694071	CL1	CL2	65.28	87.19	26.72	155.61	112516.4	7.31	531.90	462.20	56.92
N1870694877	BL1	CL2	64.77	92.17	26.73	161.20	98002.7	6.37	523.80	456.40	57.10
N1870695588	CL1	IR1	64.16	97.23	26.73	166.12	84794.5	6.05	518.10	446.70	56.97
N1870695654	CL1	CL2	64.09	97.74	26.73	166.58	83550.7	6.05	516.30	446.90	56.94
N1870697721	CL1	CL2	59.34	118.89	26.73	180.90	43606.5	8.74	484.40	401.50	53.08
N1870697837	CL1	GRN	58.73	120.56	26.72	181.70	41341.8	9.05	481.20	399.20	52.55
N1870698179	P60	GRN	56.41	125.98	26.72	184.06	34698.2	9.91	465.50	385.00	50.52
N1870698212	P12	GRN	56.13	126.55	26.73	184.29	34060.8	9.98	466.30	386.90	50.27
N1870698245	CL1	CL2	55.84	127.14	26.73	184.53	33417.2	10.05	461.80	384.50	50.02
N1870698933	CL1	CL2	45.04	141.88	26.73	189.29	20616.8	7.98	363.60	340.60	41.81
N1870698966	CL1	UV3	44.17	142.72	26.73	189.52	20060.3	7.48	350.90	372.50	41.24
N1870699054	CL1	IR1	41.46	145.14	26.73	190.14	18550.3	5.63	318.30	382.60	39.55
N1870699087	CL1	IR3	40.35	146.06	26.73	190.36	18012.9	4.76	305.40	391.90	38.89
N1870699153	CL1	UV3	37.87	147.96	26.72	190.80	16955.8	2.57	272.70	405.30	37.53
N1870699208	CL1	GRN	35.50	149.65	26.73	191.20	16089.7	0.17	248.20	424.60	36.36
N1870699241	CL1	IR1	33.96	150.68	26.72	191.43	15594.6	358.48	229.90	442.80	35.67
N1870699274	CL1	IR3	32.35	151.71	26.73	191.65	15121.7	356.58	215.00	460.50	35.00
N1870699307	CL1	CL2	30.57	152.80	26.73	191.89	14649.0	354.37	197.70	480.90	34.35
N1870699428	CL1	IR1	23.08	156.91	26.73	192.72	13106.7	343.93	150.80	587.50	32.58
N1870699461	CL1	IR3	20.76	158.07	26.73	192.95	12743.5	340.46	141.80	628.30	32.38