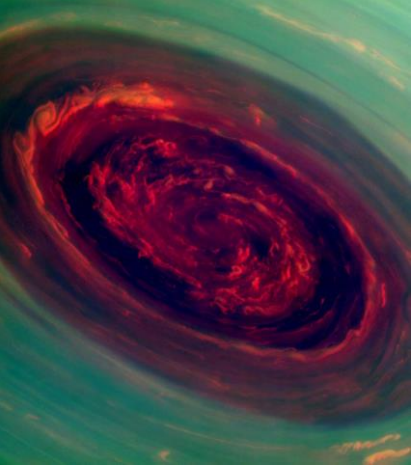

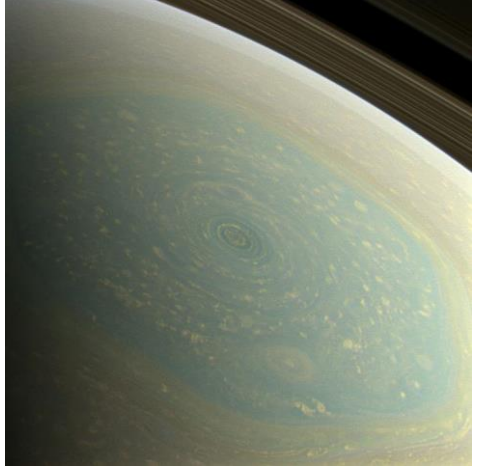
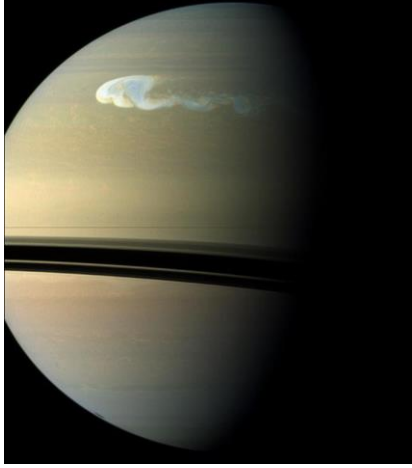

Science Planning & Sequence Team
CASSINI

SATURN TARGET WORKING TEAM

Rev 146 Segment Legacy Package

Segment Boundary: March 7, 2011 – March 22, 2011
2011-066T13:02:00 – 2011-081T04:33:00

Integration Began 06/28/2010
Segment Delivered to S66 Sequence 09/28/2010
Lead Integrator was Kathleen Kelleher

Legacy Package Assembled by Kathleen Kelleher

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*** N.A. = Slide present but content not available.**

Segment Overview and Final Products

Segment Summary

- Saturn 146 is the second half of a 25-day “CAKE” (Cassini Apoapse for Kronian Exploration) split by a sequence boundary in the first equatorial phase (EQ-1) of the Solstice Mission.
  - The first part of this CAKE was in the end of S66 and left off ~18 hours after apoapse.
  - Saturn 146 is 14.5 days long in S67, an inbound segment that runs ~13 days until periapse on 079T11:45:07 and ending ~1.7 days after periapse.
- The timeline was filled primarily with typical CAKE template activities, such as VIMS/ISS wind studies, UVIS EUV/FUVs, and CIRS-led composition and mapping.
- During the periapse period, VIMS and RADAR teamed up to perform a deep-atmosphere campaign (Note: These observations proved extremely valuable in discovering the ammonia-dry wake of the Great Storm of 2010-2011). A pair of VIMS deep dynamics atmosphere mosaic PIEs (Pre-Integrated Event) were executed on either side of a 14 hour RADAR Saturn global map, positioned to cover the same territory with the ORS instruments and RADAR. These RADAR observations, comprised of pole-to-pole scans, were stressful for the reaction wheels and required special negotiations with AACS.
- Out-of-discipline activities included ISS irregular rock imaging, and an Opnav.
- The same waypoint from the first half of the CAKE was continued for most of the segment until close (-10 hours) to periapse when it required change due to heating. RBOT (reaction wheel) friendly attitude was compatible with science.

Final Sequenced SPASS (1 of 2)

Gap 1

Gap 2

Gap 3

Gap 4

Request	Riders	Start (SCET)	Start (Epoch)	Duration	End	Primary	Secondary	Comments
SATURN_146 Segment		2011-066T13:02:00		014T15:31:00	2011-081T04:33:00			
SP_146EA_S67IVP066_PRIME	M	2011-066T13:02:00		000T00:06:00	2011-066T13:08:00	XBAND to Earth	NEG_Y to 285.96/-2.32	S67 IVP Gap
NEW WAYPOINT		2011-066T13:08:00		000T00:40:00	2011-066T13:48:00	XBAND to Earth	NEG_Y to 285.96/-2.32	
SP_146SA_WAYPTTURN066_PRIME	M	2011-066T13:08:00		000T00:40:00	2011-066T13:48:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
NEW WAYPOINT		2011-066T13:48:00		001T12:45:00	2011-068T02:33:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
ISS_146TI_M90R3CLD066_PRIME	C, M, V	2011-066T13:48:00	E146_M90R3CLD066+000T00:00:00	000T01:30:00	2011-066T15:18:00	ISS_NAC to Titan	NEG_Z to 154.918/62.369	
ISS_146SA_SATMONIT001_PRIME	M	2011-066T15:18:00		000T18:35:00	2011-067T09:53:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
UVIS_146SA_EUVFUV001_PRIME	M	2011-067T09:53:00		000T16:00:00	2011-068T01:53:00	UVIS_FUV to Saturn	NEG_Z to 37.5/83.7	
SP_146EA_DLTURN068_PRIME	M	2011-068T01:53:00		000T00:40:00	2011-068T02:33:00	XBAND to Earth	NEG_Y to 257.3/82.0	
NEW WAYPOINT		2011-068T02:33:00		000T11:10:00	2011-068T13:43:00	XBAND to Earth	NEG_Y to 257.3/82.0	
SP_146EA_YBIAS068_PRIME	M	2011-068T02:33:00		000T01:30:00	2011-068T04:03:00	XBAND to Earth	NEG_Y to 257.3/82.0	
SP_146EA_G34BWGNON068_PRIME	C, M	2011-068T04:03:00		000T09:00:00	2011-068T13:03:00	XBAND to Earth	Rolling/SRU	NEG_Y to Saturn (0,0,-65), MIMI
SP_146SA_WAYPTTURN068_PRIME		2011-068T13:03:00		000T00:40:00	2011-068T13:43:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
NEW WAYPOINT		2011-068T13:43:00		001T12:35:00	2011-070T02:18:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
ISS_146TI_M90R3CLD068_PRIME	C, V	2011-068T13:43:00	E146_M90R3CLD068+000T00:00:00	000T01:30:00	2011-068T15:13:00	ISS_NAC to Titan	NEG_Z to 166.023/54.187	
ISS_146SA_WIND5HR001_PRIME	V	2011-068T15:13:00		000T05:00:00	2011-068T20:13:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	collaborative with VIMS
CIRS_146SA_COMPSIT001_PRIME		2011-068T20:13:00		000T06:00:00	2011-069T02:13:00	CIRS_FP1 to Saturn	NEG_Z to NSP	
ISS_146SA_WIND5HR002_PRIME	V	2011-069T02:13:00		000T05:00:00	2011-069T07:13:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	collaborative with VIMS
ISS_146SA_WIND5HR003_PRIME	V	2011-069T07:13:00		000T05:00:00	2011-069T12:13:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	collaborative with VIMS
CIRS_146SA_COMPSIT002_PRIME		2011-069T12:13:00		000T06:00:00	2011-069T18:13:00	CIRS_FP1 to Saturn	NEG_Z to NSP	
ISS_146SA_WIND5HR004_PRIME	V	2011-069T18:13:00		000T05:00:00	2011-069T23:13:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	collaborative with VIMS
SP_146EA_DLTURN070_PRIME		2011-070T01:38:00		000T00:40:00	2011-070T02:18:00	XBAND to Earth	NEG_Y to 285.6/-7.0	
NEW WAYPOINT		2011-070T02:18:00		000T11:10:00	2011-070T13:28:00	XBAND to Earth	NEG_Y to 285.6/-7.0	
SP_146EA_YBIAS070_PRIME		2011-070T02:18:00		000T01:30:00	2011-070T03:48:00	XBAND to Earth	NEG_Y to 292.1/-62.4	
SP_146EA_G70METNON070_PRIME	C	2011-070T03:48:00		000T09:00:00	2011-070T12:48:00	XBAND to Earth	Rolling/SRU	NEG_Y to Saturn (0,0,-65), MIMI
SP_146SA_WAYPTTURN070_PRIME		2011-070T12:48:00		000T00:40:00	2011-070T13:28:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
NEW WAYPOINT		2011-070T13:28:00		001T12:35:00	2011-072T02:03:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
ISS_146TI_M90R3CLD070_PRIME	C, V	2011-070T13:28:00	E146_M90R3CLD070+000T00:00:00	000T01:30:00	2011-070T14:58:00	ISS_NAC to Titan	NEG_Z to 37.5/83.7	No Preference to Secondary Pointing
UVIS_146SA_EUVFUV002_PRIME		2011-070T14:58:00		000T16:00:00	2011-071T06:58:00	UVIS_FUV to Saturn	NEG_Z to 37.5/83.7	
CIRS_146SA_MIRMAP001_PRIME	V	2011-071T06:58:00		000T11:00:00	2011-071T17:58:00	CIRS_FP3 to Saturn	NEG_Z to NSP	
CIRS_146SA_COMPSIT003_PRIME	V	2011-071T17:58:00		000T06:00:00	2011-071T23:58:00	CIRS_FP1 to Saturn	NEG_Z to NSP	
SP_146EA_DLTURN072_PRIME		2011-072T01:23:00		000T00:40:00	2011-072T02:03:00	XBAND to Earth	NEG_Y to 285.6/-7.9	
NEW WAYPOINT		2011-072T02:03:00		000T11:10:00	2011-072T13:13:00	XBAND to Earth	NEG_Y to 285.6/-7.9	
SP_146EA_YBIAS072_PRIME		2011-072T02:03:00		000T01:30:00	2011-072T03:33:00	XBAND to Earth	NEG_Y to 292.1/-63.2	
SP_146EA_G34BWGNON072_PRIME	C	2011-072T03:33:00		000T09:00:00	2011-072T12:33:00	XBAND to Earth	Rolling/SRU	NEG_Y to Saturn (0,0,-65), MIMI
SP_146SA_WAYPTTURN072_PRIME		2011-072T12:33:00		000T00:40:00	2011-072T13:13:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
NEW WAYPOINT		2011-072T13:13:00		001T12:50:00	2011-074T02:03:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
ISS_146SA_WIND5HR005_PRIME		2011-072T13:13:00		000T05:00:00	2011-072T18:13:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	collaborative with VIMS
CIRS_146SA_COMPSIT004_PRIME	V	2011-072T18:13:00		000T06:00:00	2011-073T00:13:00	CIRS_FP1 to Saturn	NEG_Z to NSP	
ISS_146SA_WIND5HR006_PRIME		2011-073T00:13:00		000T05:00:00	2011-073T05:13:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	collaborative with VIMS
CIRS_146SA_COMPSIT005_PRIME	V	2011-073T05:13:00		000T06:00:00	2011-073T11:13:00	CIRS_FP1 to Saturn	NEG_Z to NSP	
ISS_146SA_SATMONIT002_PRIME		2011-073T11:13:00		000T01:40:00	2011-073T12:53:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
NAV_146SK_OPNAV731_PRIME		2011-073T12:53:00		000T01:30:00	2011-073T14:23:00	ISS_NAC to Satellites	NEG_Z to 37.5/83.7	Starts at waypoint, ends at same waypoint
CIRS_146SA_MIRMAP002_PRIME	V	2011-073T14:23:00		000T11:00:00	2011-074T01:23:00	CIRS_FP3 to Saturn	NEG_Z to NSP	
SP_146EA_DLTURN074_PRIME		2011-074T01:23:00		000T00:40:00	2011-074T02:03:00	XBAND to Earth	NEG_Y to 285.5/-9.3	
NEW WAYPOINT		2011-074T02:03:00		000T11:10:00	2011-074T13:13:00	XBAND to Earth	NEG_Y to 285.5/-9.3	
SP_146EA_YBIAS074_PRIME		2011-074T02:03:00		000T01:30:00	2011-074T03:33:00	XBAND to Earth	NEG_Y to 285.5/-9.3	
SP_146EA_G70METNON074_PRIME	C	2011-074T03:33:00		000T09:00:00	2011-074T12:33:00	XBAND to Earth	Rolling/SRU	NEG_Y to Saturn (0,0,-9.5), MIMI
SP_146SA_WAYPTTURN074_PRIME		2011-074T12:33:00		000T00:40:00	2011-074T13:13:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
NEW WAYPOINT		2011-074T13:13:00		000T22:40:00	2011-075T11:53:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
CIRS_146SA_MIRMAP003_PRIME	V	2011-074T13:13:00		000T22:00:00	2011-075T11:13:00	CIRS_FP3 to Saturn	NEG_Z to NSP	
SP_146EA_DLTURN075_PRIME		2011-075T11:13:00		000T00:40:00	2011-075T11:53:00	XBAND to Earth	NEG_Y to 123.7/31.3	

Final Sequenced SPASS (2 of 2)

Gap 5

Gap 6

NEW WAYPOINT		2011-075T11:53:00		001T01:05:00	2011-076T12:58:00	XBAND to Earth	NEG_Y to 123.7/31.3	
ISS_146OT_SKAROT072_PRIME		2011-075T11:53:00		000T13:55:00	2011-076T01:48:00	UVIS_FUV to Rocks	NEG_Z to Earth	
SP_146EA_YBIAS076_PRIME		2011-076T01:48:00		000T01:30:00	2011-076T03:18:00	XBAND to Earth	NEG_Y to 123.7/31.3	
SP_146EA_G70METNON076_PRIME	C	2011-076T03:18:00		000T09:00:00	2011-076T12:18:00	XBAND to Earth	Rolling/SRU	NEG_Y to Saturn (0,0,-9.5), MIMI
SP_146SA_WAYPTTURN076_PRIME		2011-076T12:18:00		000T00:40:00	2011-076T12:58:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
NEW WAYPOINT		2011-076T12:58:00		001T12:50:00	2011-078T01:48:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	
UVIS_146SA_EUVFUV003_PRIME		2011-076T12:58:00		000T16:00:00	2011-077T04:58:00	UVIS_FUV to Saturn	NEG_Z to 37.5/83.7	No Preference to Secondary Pointing
CIRS_146SA_COMPSIT006_PRIME	V	2011-077T04:58:00		000T11:00:00	2011-077T15:58:00	CIRS_FP1 to Saturn	NEG_Z to INSP	
ISS_146SA_NALGTNG001_PRIME	V	2011-077T15:58:00		000T09:10:00	2011-078T01:08:00	ISS_NAC to Saturn	NEG_Z to 37.5/83.7	collaborative with VIMS
SP_146EA_DLTURN078_PRIME		2011-078T01:08:00		000T00:40:00	2011-078T01:48:00	XBAND to Earth	NEG_X to INSP	
NEW WAYPOINT		2011-078T01:48:00		000T11:04:00	2011-078T12:52:00	XBAND to Earth	NEG_X to INSP	
ENGR_146SC_KPTYBIAS078_PRIME		2011-078T01:48:00		000T01:30:00	2011-078T03:18:00	NEG_Z to DELTA_H	NEG_X to Sun	
SP_146EA_G70METNON078_PRIME	C	2011-078T03:18:00		000T09:00:00	2011-078T12:18:00	XBAND to Earth	NEG_X to INSP	NEG_X to NEP or INSP, CAPS
SP_146SA_WAYPTTURN078_PRIME		2011-078T12:18:00		000T00:34:00	2011-078T12:52:00	ISS_NAC to Saturn (0.0,0.0,15.0 deg. offset)	NEG_X to INSP	
NEW WAYPOINT		2011-078T12:52:00		000T00:06:00	2011-078T12:58:00	ISS_NAC to Saturn (0.0,0.0,15.0 deg. offset)	NEG_X to INSP	
SP_146SA_WAYPTTURN478_PRIME		2011-078T12:52:00		000T00:06:00	2011-078T12:58:00	ISS_NAC to Saturn (0.0,0.0,6.5 deg. offset)	NEG_X to INSP	
NEW WAYPOINT		2011-078T12:58:00		000T14:42:00	2011-079T03:40:00	ISS_NAC to Saturn (0.0,0.0,6.5 deg. offset)	NEG_X to INSP	
VIMS_146SA_DEEPDYN001_PIE	C	2011-078T12:58:00		000T05:02:00	2011-078T18:00:00	ISS_NAC to Saturn	NEG_X to INSP	PIE
UVIS_146SA_EUVFUV004_PIE		2011-078T18:00:00		000T03:00:00	2011-078T21:00:00	UVIS_FUV to Saturn	NEG_X to INSP	This is a PIE
CIRS_146SA_COMPSIT007_PRIME	M	2011-078T21:00:00		000T06:00:00	2011-079T03:00:00	CIRS_FP1 to Saturn	NEG_X to INSP	
SP_146SA_WAYPTTURN079_PRIME	M	2011-079T03:00:00		000T00:06:00	2011-079T03:06:00	NEG_Y to Saturn (0.0,0.0,20.0 deg. offset)	NEG_X to INSP	
SP_146SA_WAYPTTURN479_PRIME	M	2011-079T03:06:00		000T00:34:00	2011-079T03:40:00	NEG_Z to 26.139/-6.213	NEG_Y to INSP	
NEW WAYPOINT		2011-079T03:40:00		000T15:20:00	2011-079T19:00:00	NEG_Z to 26.139/-6.213	NEG_Y to INSP	
RADAR_146SA_GLOBALMAP001_PIE		2011-079T04:00:00		000T14:15:00	2011-079T18:15:00	NEG_Z to Saturn	NEG_Y to INSP	pickup [-Z to 26.139/-6.213, -Y to INSP]; handoff [-Z to 154.208/2.863, -Y to INSP].
Periapse RH 4.716 Rs, lat ...		2011-079T11:45:07		000T00:00:01	2011-079T11:45:08			
SP_146SA_WAYPTTURN579_PRIME		2011-079T18:30:00		000T00:30:00	2011-079T19:00:00	ISS_NAC to Saturn	NEG_X to INSP	Pick-up at RADAR h/o per RBOT (NEG_Z to 154.208/2.863; NEG_Y to INSP)
NEW WAYPOINT		2011-079T19:00:00		000T23:03:00	2011-080T18:03:00	ISS_NAC to Saturn	NEG_X to INSP	
VIMS_146SA_DEEPDYN002_PIE	C, M	2011-079T19:00:00		000T17:45:00	2011-080T12:45:00	ISS_NAC to Saturn	NEG_X to INSP	PIE
UVIS_146SA_EUVFUV005_PIE		2011-080T12:45:00		000T04:38:00	2011-080T17:23:00	UVIS_FUV to Saturn	NEG_X to INSP	This is a PIE
SP_146EA_DLTURN080_PRIME		2011-080T17:23:00		000T00:40:00	2011-080T18:03:00	XBAND to Earth	NEG_X to INSP	
NEW WAYPOINT		2011-080T18:03:00		000T11:10:00	2011-081T05:13:00	XBAND to Earth	NEG_X to INSP	
ENGR_146SC_KPTYBIAS080_PRIME		2011-080T18:03:00		000T01:30:00	2011-080T19:33:00	POS_Z to DELTA_H (0.0,0.0,68.0 deg. offset)	NEG_X to Sun	
SP_146EA_M70METNON080_PRIME	C	2011-080T19:33:00		000T09:00:00	2011-081T04:33:00	XBAND to Earth	Rolling/SRU	POS_X to NEP or INSP, CAPS

Final Sequenced SMT and Data Volume (1 of 2)

DATA VOLUME SUMMARY --- TRANSFER FRAME OVERHEAD INCLUDED (80 BITS PER 8800-BIT FRAME)

			OBSERVATION_PERIOD							DOWNLINK_PASS							
			P4						P5	RECORDED		PLAYBACK					
DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	START (Mb)	SCI (Mb)	HK+E (Mb)	TOTAL (Mb)	CPACTY (Mb)	MRGN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	(%)	CAROVR (Mb)
SP_146EA_G34BWGNON068_PRIME	068 04:03	068 13:03	0	981	165	1146	3307	2161	0	193	53	1392	877	-515	-14	0%	515
SP_146EA_G70METNON070_PRIME	070 03:48	070 12:48	515	2643	164	3321	3307	-14	0	214	53	3574	4222	648	634	2%	0
SP_146EA_G34BWGNON072_PRIME	072 03:33	072 12:33	0	1758	164	1921	3307	1385	0	201	53	2175	863	-1312	-13	0%	1312
SP_146EA_G70METNON074_PRIME	074 03:33	074 12:33	1312	1844	165	3321	3307	-13	0	219	53	3579	4259	680	2107	9%	0
SP_146EA_G70METNON076_PRIME	076 03:18	076 12:18	0	1716	164	1880	3307	1427	0	206	53	2139	4230	2091	3337	16%	0
SP_146EA_G70METNON078_PRIME	078 03:18	078 12:18	0	1896	165	2061	3307	1246	0	228	53	2342	4222	1879	1885	10%	0
SP_146EA_M70METNON080_PRIME	080 19:33	081 04:33	0	3066	235	3301	3307	6	0	214	53	3568	3944	376	1674	11%	0

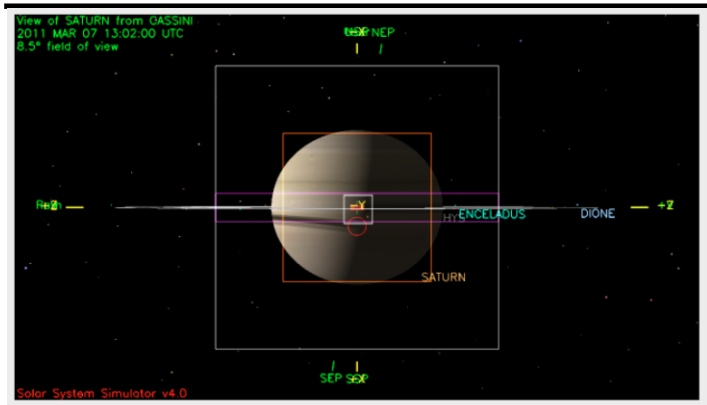
* NOTE: Negative SSR (P4) Margins did not result in data loss due to compression/under-utilization.

Final Sequenced SMT and Data Volume (2 of 2)

DATA VOLUME REPORT --- TRANSFER FRAME OVERHEAD NOT INCLUDED

Event	Start doy hh:mm	End doy hh:mm	CAPS (Mb)	CDA (Mb)	CIRS (Mb)	INMS (Mb)	ISS (Mb)	MAG (Mb)	MIMI (Mb)	RADAR (Mb)	RPWS (Mb)	UVIS (Mb)	VIMS (Mb)	PROBE (Mb)	ENGR (Mb)	TOTAL (Mb)
OBSERVATION_NOR	066 13:02	068 04:03	98.3	73.6	21.6	18.4	180.0	34.7	119.4	0.0	126.4	289.8	10.0	0.0	163.1	1135.3
SP_146EA_G34BWGNON068_PRIME	068 04:03	068 13:03	22.7	17.0	86.4	3.2	0.0	8.0	19.4	0.0	29.2	4.9	0.0	0.0	0.0	190.8
DAILY TOTAL SCIENCE	066 13:02	068 13:03	121.0	90.6	108.0	21.6	180.0	42.7	138.8	0.0	155.6	294.8	10.0	0.0	163.1	
OBSERVATION_NOR	068 13:03	070 03:48	127.4	73.1	108.0	15.9	1250.0	53.0	83.7	0.0	125.5	72.5	710.0	0.0	162.0	2781.0
SP_146EA_G70METNON070_PRIME	070 03:48	070 12:48	22.7	17.0	86.4	3.2	0.0	16.0	19.4	0.0	42.4	4.9	0.0	0.0	0.0	212.1
DAILY TOTAL SCIENCE	068 13:03	070 12:48	150.1	90.1	194.4	19.1	1250.0	69.0	103.1	0.0	168.0	77.4	710.0	0.0	162.0	
OBSERVATION_NOR	070 12:48	072 03:33	97.7	73.1	144.0	14.0	135.0	68.9	83.7	0.0	125.5	239.7	760.0	0.0	162.0	1903.5
SP_146EA_G34BWGNON072_PRIME	072 03:33	072 12:33	22.7	17.0	86.4	3.2	0.0	16.0	19.4	0.0	29.2	4.9	0.0	0.0	0.0	198.8
DAILY TOTAL SCIENCE	070 12:48	072 12:33	120.3	90.1	230.4	17.2	135.0	84.9	103.1	0.0	154.7	244.6	760.0	0.0	162.0	
OBSERVATION_NOR	072 12:33	074 03:33	98.3	73.6	165.6	14.0	616.5	69.4	84.2	0.0	126.4	36.2	500.0	0.0	163.0	1947.2
OBSERVATION_SI	072 12:33	074 03:33	0.0	0.0	0.0	0.0	43.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.5
SP_146EA_G70METNON074_PRIME	074 03:33	074 12:33	22.7	17.0	86.4	3.2	0.0	16.0	24.3	0.0	42.4	4.9	0.0	0.0	0.0	217.0
DAILY TOTAL SCIENCE	072 12:33	074 12:33	121.0	90.5	252.0	17.3	660.0	85.4	108.5	0.0	168.8	41.2	500.0	0.0	163.0	
OBSERVATION_NOR	074 12:33	076 03:18	97.6	73.1	316.8	14.0	300.0	68.9	104.6	0.0	125.5	0.0	600.0	0.0	162.0	1862.5
SP_146EA_G70METNON076_PRIME	076 03:18	076 12:18	22.7	17.0	86.4	3.2	0.0	16.0	24.3	0.0	29.2	4.9	0.0	0.0	0.0	203.7
DAILY TOTAL SCIENCE	074 12:33	076 12:18	120.3	90.1	403.2	17.2	300.0	84.9	128.9	0.0	154.7	4.9	600.0	0.0	162.0	
OBSERVATION_NOR	076 12:18	078 03:18	98.3	73.6	79.2	14.0	213.0	69.4	105.3	0.0	126.4	289.8	810.0	0.0	163.0	2041.9
SP_146EA_G70METNON078_PRIME	078 03:18	078 12:18	22.7	37.6	86.4	3.2	0.0	16.0	24.3	0.0	36.1	0.0	0.0	0.0	0.0	226.3
DAILY TOTAL SCIENCE	076 12:18	078 12:18	121.0	111.1	165.6	17.3	213.0	85.4	129.6	0.0	162.5	289.8	810.0	0.0	163.0	
OBSERVATION_NOR	078 12:18	080 19:33	139.2	368.1	262.2	30.0	200.0	98.3	149.2	56.5	496.6	138.3	1100.0	0.0	230.9	3269.2
SP_146EA_M70METNON080_PRIME	080 19:33	081 04:33	22.7	17.0	86.4	3.2	0.0	16.0	24.3	0.0	42.4	0.0	0.0	0.0	0.0	212.0
DAILY TOTAL SCIENCE	078 12:18	081 04:33	161.9	385.1	348.6	33.2	200.0	114.3	173.5	56.5	539.1	138.3	1100.0	0.0	230.9	
OBSERVATION_NOR	081 04:33	082 09:48	421.2	55.2	0.0	20.6	0.0	208.1	89.5	0.0	137.9	0.3	0.0	0.0	122.2	1055.0
SP_146EA_C34BWGNON082_PRIME	082 09:48	082 18:18	122.4	16.0	86.4	3.1	0.0	60.5	26.0	0.0	40.1	4.7	0.0	0.0	0.0	359.1
DAILY TOTAL SCIENCE	081 04:33	082 18:18	543.6	71.2	86.4	23.7	0.0	268.5	115.5	0.0	178.0	4.9	0.0	0.0	122.2	

Segment Geometry



Rev 146 INBOUND
2011 - 066T13:02:00 SCET
2011 MAR 07 13:02:00 SCET
2011 MAR 07 14:14:33 ERT
Apoapse__146 + 001T00:22:42
Periapse_146 - 012T22:43:05
Light time: 72.6 min
Orbit period: 27.9 days

Radius	3253932 km	53.99 Rs
Rad_cyl	3253865 km	53.99 Rs
Z_ht_cyl	20952 km	0.35 Rs
Mag_L	53.99	
Semi_axs	1775265 km	29.46 Rs
Eccentricity	0.839	
Inclination	0.38 deg	
Sun_range	9.60 AU	
Earth_range	8.72 AU	

--- DSN ELEV -- D/L -- U/L --------

Goldstone	16.9	41.9
Canberra	49.1	22.9
Madrid	-53.3	-40.1

------- LOOK DIRECTION INFO -------

FOV	8.5 deg 147.7 mrad
RA	-82.802 deg
DEC	3.196 deg
Crosses_RP_0	0.000 Rs
EPS	2.893 deg
SEP	150.763 deg
ORS b/s angle	95.2 deg
ORS rad angle	98.5 deg

Point NEG_Y at SATURN and align NEG_X = Up with NSP

User vector - RA: +37.500 DEC: +83.700 Paste Current RA/DEC

Tilt L | Up | Tilt R | Left | Reset | Right | Image | Down | Hi Res

Zoom Out | Fill Screen | Zoom In | Labels | Axes | Orbits | Vectors | FOVs | Lat/lons

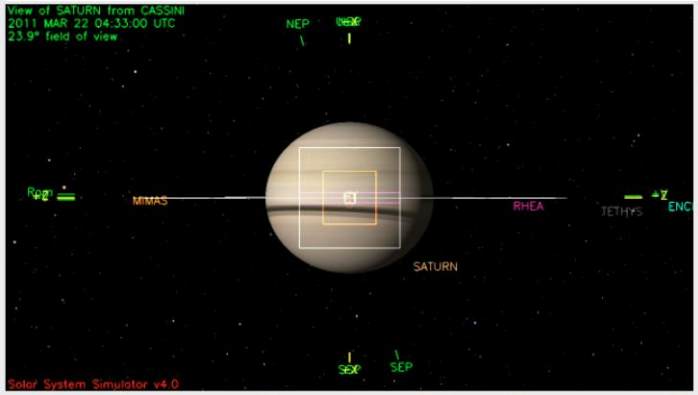
Year | Month | Day | Hour | Minute | Second

Turn analyzer: SATURN to EARTH about Z on RWA = 10.3 min / 97.9 deg Event

BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR_DIAMETER (deg)	ANGLR_DIAMETER mrad)	SUB_S/C LON	SUB_S/C LAT	ALON (deg)	VREL (km/s)	Z_HGHT (km)	ANGLE_FROM SATRN	ANGLE_FROM EARTH	ANGLE_FROM RAM
SATURN	--	--	3253932	53.99	3193664	52.99	84.6	2.12	37.05	19	0	0	1.4	0	0.0	97.9	82.7
MIMAS	--	--	3070747	50.95	3070540	50.95	84.5	0.01	0.14	182	2	-2	13.1	-4974	0.2	98.1	82.8
ENCELADUS	--	--	3479858	57.74	3479601	57.74	83.4	0.01	0.15	347	0	-162	13.9	11	1.2	99.1	83.9
TETHYS	--	--	3544931	58.82	3544390	58.81	83.8	0.02	0.30	352	-1	-171	12.7	-3226	0.8	98.7	83.4
DIONE	--	--	3594288	59.64	3593725	59.63	81.9	0.02	0.31	336	0	-153	11.2	-6	2.7	100.6	85.4
RHEA	--	--	2779188	46.11	2778422	46.10	80.3	0.03	0.55	211	-0	-24	7.1	3097	4.4	102.2	87.0
TITAN	--	--	2925794	48.55	2923219	48.50	62.3	0.10	1.76	264	0	-64	4.7	4982	22.7	120.2	105.3
HYPERION	--	--	3512029	58.27	3511894	58.27	110.9	0.01	0.09	66	-10	86	5.0	197	26.6	71.7	56.1
IAPETUS	--	--	3723737	61.79	3722992	61.77	143.1	0.02	0.40	55	-13	67	3.4	97285	59.0	39.6	23.7
PHOEBE	--	--	12655829	209.99	12655716	209.99	131.7	0.00	0.02	179	-32	30	2.7	6347577	132.6	45.1	63.0
SATURN	--	--	3253932	53.99	3193664	52.99	84.6	2.12	37.05	19	0	0	1.4	0	0.0	97.9	82.7

Seg Start (Left)

Seg End (below)



Rev 146 OUTBOUND
2011 - 081T04:33:00 SCET
2011 MAR 22 04:33:00 SCET
2011 MAR 22 05:44:47 ERT
Apoapse__146 + 015T15:53:42
Periapse_146 + 001T16:47:55
Light time: 71.8 min
Orbit period: 27.9 days

Radius	1163926 km	19.31 Rs
Rad_cyl	1163921 km	19.31 Rs
Z_ht_cyl	3485 km	0.06 Rs
Mag_L	19.31	
Semi_axs	1774966 km	29.45 Rs
Eccentricity	0.840	
Inclination	0.38 deg	
Sun_range	9.60 AU	
Earth_range	8.63 AU	

--- DSN ELEV -- D/L -- U/L --------

Goldstone	32.0	4.5
Canberra	-36.3	-51.1
Madrid	15.3	38.1

------- LOOK DIRECTION INFO -------

FOV	23.9 deg 417.8 mrad
RA	-133.979 deg
DEC	6.263 deg
Crosses_RP_0	0.000 Rs
EPS	1.426 deg
SEP	166.116 deg
ORS b/s angle	145.9 deg
ORS rad angle	98.6 deg

Point NEG_Y at SATURN and align NEG_X = Up with NSP

User vector - RA: +37.500 DEC: +83.700 Paste Current RA/DEC

Tilt L | Up | Tilt R | Left | Reset | Right | Image | Down | Hi Res

Zoom Out | Fill Screen | Zoom In | Labels | Axes | Orbits | Vectors | FOVs | Lat/lons

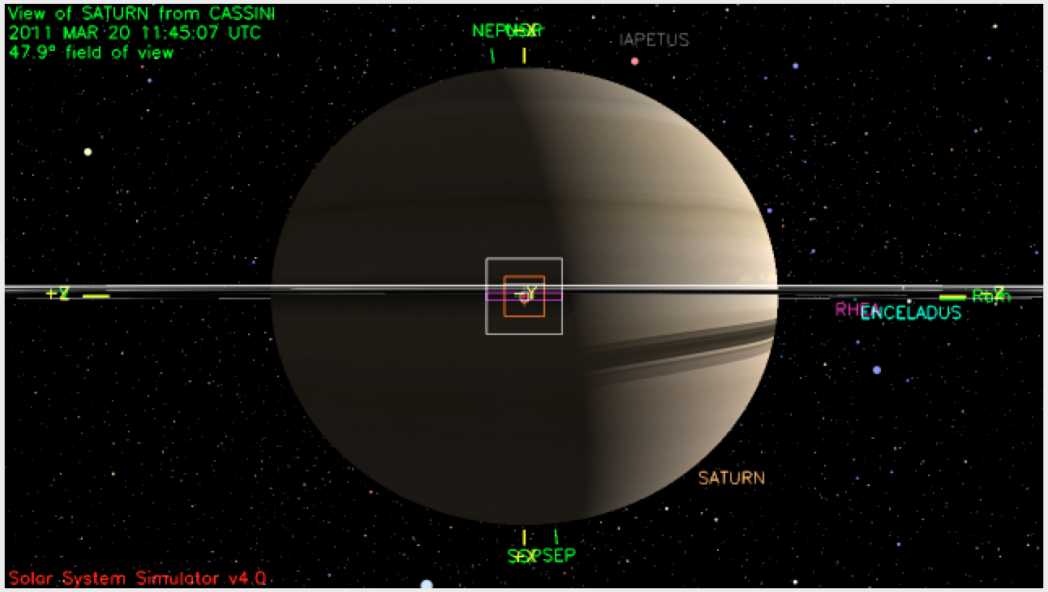
Year | Month | Day | Hour | Minute | Second

Turn analyzer: SATURN to EARTH about Z on RWA = 13.9 min / 147.2 deg Event

BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR_DIAMETER (deg	ANGLR_DIAMETER mrad)	SUB_S/C LON	SUB_S/C LAT	ALON (deg)	VREL (km/s)	Z_HGHT (km)	ANGLE_FROM SATRN	ANGLE_FROM EARTH	ANGLE_FROM RAM
SATURN	--	--	1163926	19.31	1103658	18.31	34.1	5.94	103.61	66	0	0	6.6	0	0.0	147.2	160.8
MIMAS	--	--	1256603	20.85	1256403	20.85	41.6	0.02	0.33	60	1	116	12.3	4330	7.7	139.6	153.1
ENCELADUS	--	--	1229316	20.40	1229064	20.39	23.6	0.02	0.42	296	0	-100	18.8	-35	11.0	157.5	171.8
TETHYS	--	--	1386906	23.01	1386369	23.00	25.7	0.04	0.78	324	-1	-135	17.9	-4899	8.7	155.4	169.5
DIONE	--	--	853596	14.16	853034	14.15	46.0	0.08	1.32	139	0	29	5.0	-171	12.3	135.3	148.5
RHEA	--	--	1673182	27.76	1672414	27.75	28.7	0.05	0.92	350	-0	-162	14.3	-1060	5.6	152.5	166.4
TITAN	--	--	1667080	27.66	1664505	27.62	17.8	0.18	3.09	312	0	-87	11.4	7383	48.6	160.8	150.6
HYPERION	--	--	2478977	41.13	2478859	41.13	60.1	0.01	0.13	78	-51	133	7.7	-27644	26.8	121.2	134.0
IAPETUS	--	--	3012238	49.98	3011490	49.97	79.3	0.03	0.50	342	-2	-52	8.2	921881	108.1	99.2	90.1
PHOEBE	--	--	13873934	230.20	13873822	230.20	131.4	0.00	0.02	144	-27	-13	7.2	5865822	151.5	46.8	40.9
SATURN	--	--	1163926	19.31	1103658	18.31	34.1	5.94	103.61	66	0	0	6.6	0	0.0	147.2	160.8

	Saturn Range	Phase Angle	Sub-S/C Lat.
Segment Start	53.992 Rs	84.6	0
Periapse	4.716	97.8	0
Apoapse	NA		
Segment End	19.31 Rs	34.1	0

Segment Geometry Periapse

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Rev 146 OUTBOUND
2011 -  079T11:45:07 SCET
2011 MAR 20 11:45:07 SCET
2011 MAR 20 12:57:01 ERT
Apoapse__146 + 013T23:05:49
Periapse_146 + 00:00:02
Light time:     71.9 min
Orbit period:   28.1 days
Radius      284549 km        4.72 Rs
Rad_cyl     284543 km        4.72 Rs
Z_ht_cyl     -1817 km       -0.03 Rs
Mag_L          4.72
Semi_axs   1783626 km       29.59 Rs
Eccentricity     0.840
Inclination      0.38 deg
Sun_range        9.61 AU
Earth_range      8.65 AU
--- DSN ELEV -- D/L -- U/L --------
Goldstone       21.7    45.1
Canberra        45.2    18.2
Madrid         -52.4   -36.3
------- LOOK DIRECTION INFO -------
FOV             47.9 deg  835.7 mrad
RA              95.147 deg
DEC             -3.390 deg
Crosses_RP_@     0.000 Rs
EPS              1.607 deg
SEP            164.298 deg
ORS b/s angle   82.2 deg
ORS rad angle   98.7 deg
```

Point NEG_Y at SATURN and align NEG_X = Up with NSP

User vector - RA: +37.500 DEC: +83.700 Paste Current RA/DEC

Tilt L | Up | Tilt R | Left | Reset | Right | Image | Down | Hi Res

Zoom Out | Fill Screen | Zoom In | Labels | Axes | Orbits | Vectors | FOVs | Lat/lons

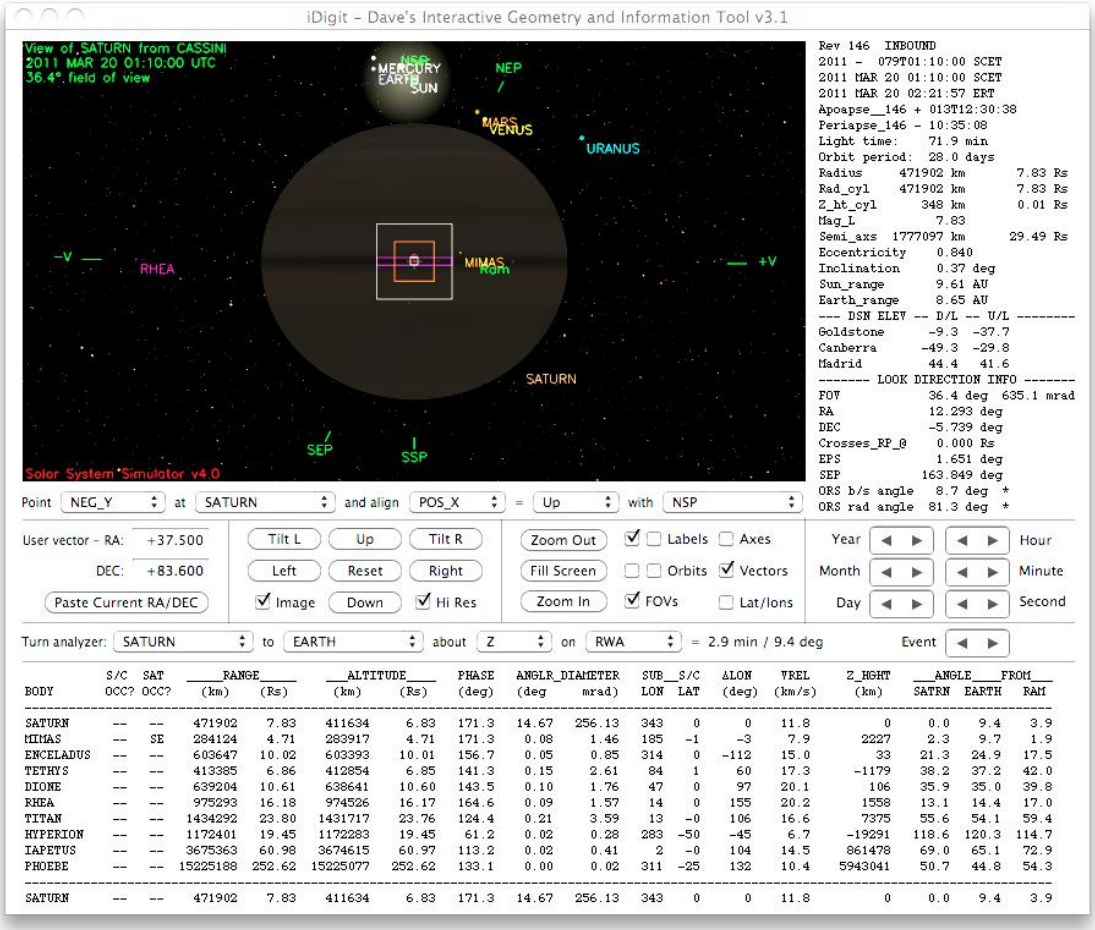
Year | Month | Day | Hour | Minute | Second

Turn analyzer: SATURN to EARTH about Z on RWA = 9.0 min / 80.7 deg Event

BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR_DIAMETER (deg	mrad)	SUB_S/C LON	SUB_S/C LAT	ALON (deg)	VREL (km/s)	Z_HGHT (km)	ANGLE_FROM SATRN	ANGLE_FROM EARTH	ANGLE_FROM RAM
SATURN	--	--	284549	4.72	224281	3.72	97.8	24.46	426.84	259	-0	0	15.7	0	0.0	80.7	90.0
MIMAS	--	--	327426	5.43	327226	5.43	131.2	0.07	1.27	303	-2	-86	20.7	-975	34.0	47.3	56.0
ENCELADUS	--	--	500088	8.30	499831	8.29	113.3	0.06	1.03	345	-0	-145	27.0	-2	15.8	65.1	74.2
TETHYS	--	--	283257	4.70	282724	4.69	36.0	0.22	3.82	59	1	59	13.7	-5575	62.5	142.3	152.5
DIONE	--	--	580718	9.64	580154	9.63	64.5	0.11	1.94	25	-0	122	22.6	223	33.7	113.9	123.7
RHEA	--	--	797408	13.23	796641	13.22	112.2	0.11	1.92	355	0	-158	23.7	2964	14.6	66.2	75.4
TITAN	--	--	1520742	25.23	1518167	25.19	96.8	0.19	3.39	355	-0	179	21.2	7819	1.0	81.6	91.0
HYPERION	--	--	1236076	20.51	1235952	20.51	45.9	0.02	0.27	337	-58	30	11.8	-21773	143.3	135.5	126.7
IAPETUS	--	--	3813237	63.27	3812490	63.26	103.7	0.02	0.39	360	1	-175	18.9	876056	13.7	74.6	85.8
PHOEBE	--	--	15142270	251.25	15142156	251.25	131.4	0.00	0.02	0	-25	-145	14.5	5927374	40.2	46.5	59.1
SATURN	--	--	284549	4.72	224281	3.72	97.8	24.46	426.84	259	-0	0	15.7	0	0.0	80.7	90.0

Solar Geometry – ORS Boresight Concerns

- While there are ***no*** NEG_Y to Sun violations anticipated during Saturn 146, there is a period during which Saturn center will come within the 12° cone. This period falls during the CIRS observation CIRS_146SA_COMPSIT007_PRIME. To avoid this violation, CIRS has agreed to point NEG_Y at the south pole of Saturn, which should keep them out of violation.



BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR_DIAMETER (deg	ANGLR_DIAMETER mrad)	SUB_S/C LON	SUB_S/C LAT	ALON (deg)	VREL (km/s)	Z_HGHT (km)	ANGLE FROM SATRN	ANGLE FROM EARTH	ANGLE FROM RAM
SATURN	--	--	471902	7.83	411634	6.83	171.3	14.67	256.13	343	0	0	11.8	0	0.0	9.4	3.9
MIMAS	--	SE	284124	4.71	283917	4.71	171.3	0.08	1.46	185	-1	-3	7.9	2227	2.3	9.7	1.9
ENCELADUS	--	--	603647	10.02	603393	10.01	156.7	0.05	0.85	314	0	-112	15.0	33	21.3	24.9	17.5
TETHYS	--	--	413385	6.86	412854	6.85	141.3	0.15	2.61	84	1	60	17.3	-1179	38.2	37.2	42.0
DIONE	--	--	639204	10.61	638641	10.60	143.5	0.10	1.76	47	0	97	20.1	106	35.9	35.0	39.8
RHEA	--	--	975293	16.18	974526	16.17	164.6	0.09	1.57	14	0	155	20.2	1558	13.1	14.4	17.0
TITAN	--	--	1434292	23.80	1431717	23.76	124.4	0.21	3.59	13	-0	106	16.6	7375	55.6	54.1	59.4
HYPERION	--	--	1172401	19.45	1172283	19.45	61.2	0.02	0.28	283	-50	-45	6.7	-19291	118.6	120.3	114.7
IAPETUS	--	--	3675363	60.98	3674615	60.97	113.2	0.02	0.41	2	-0	104	14.5	861478	69.0	65.1	72.9
PHOEBE	--	--	15225188	252.62	15225077	252.62	133.1	0.00	0.02	311	-25	132	10.4	5943041	50.7	44.8	54.3
SATURN	--	--	471902	7.83	411634	6.83	171.3	14.67	256.13	343	0	0	11.8	0	0.0	9.4	3.9

- Pointing to NEG_Y to Saturn (center) would lead to a CMT violation between ~2010-078T21:40:00 and ~2010-079T03:50:00.

- Minimum NEG_Y to Sun angle is ~8.7° at 2010-079T01:10:00.

- CIRS_146SA_COMPSIT007_PRIME will come within 15° (but not less than 12°) of the Sun. CIRS will write the necessary waiver to cover this action.

Daily Science Highlights (1 of 2)

DOY 066 (7 March 2011): Sequence S67 and the Saturn 146 segment began on DOY 066 with an ORS Titan cloud monitor. This observation was followed by an ISS observation which was part of a campaign to observe Saturn's atmosphere. The MAPS instruments began the segment with a continuous survey of the outer magnetosphere.

DOY 067 (8 March 2011): UVIS occupied most of the day with an EUV/FUV observation, which involved slow scans across Saturn's visible hemisphere to form spectral images.

DOY 068 (9 March 2011): After downlinking data to the Earth, Cassini turned back towards Titan for an ORS Titan cloud monitor. Following this observation, Cassini turned back towards Saturn so that the ORS instruments could begin a sequence of observations in which ISS, UVIS and VIMS take observations to learn more about Saturn's wind field by staring and shooting every 10 minutes to mosaic in longitude. CIRS subsequently measured oxygen compounds (H_2O, CO_2) in Saturn's stratosphere as a function of latitude.

DOY 069 (10 March 2011): CIRS, ISS, UVIS and VIMS continued their wind speed and composition measurements of Saturn's atmosphere.

DOY 070 (11 March 2011): After relaying data to the Earth, Cassini turned towards Titan to execute the third ORS Titan cloud monitor of the sequence. Following this, UVIS took its second Saturn EUV/FUV observation of the segment.

DOY 071 (12 March 2011): When DOY 071 began, CIRS was the process of taking a Saturn mid-IR map for the purposes of determining Saturn's upper troposphere and tropopause temperatures. CIRS then took observations of Saturn designed to observe oxygen compounds in Saturn's stratosphere.

DOY 072 (13 March 2011): Having pointed its high-gain antenna towards the Earth to relay data, Cassini turned back towards Saturn. The ORS instruments resumed their pattern of taking wind field measurements (ISS, UVIS) followed by CIRS observations of molecular compounds in Saturn's stratosphere with VIMS riding along.

DOY 073 (14 March 2011): After the completion of the previous day's sequence of observations, ISS snapped some images of Hyperion for the purposes of spacecraft navigation. CIRS then turned toward Saturn to observe Saturn in the mid-infrared and determine temperatures in Saturn's upper troposphere and tropopause.

DOY 074 (15 March 2011): CIRS began another long mid-IR map of Saturn's atmosphere.

Daily Science Highlights (2 of 2)

DOY 075 (16 March 2011): Following the conclusion of the CIRS mid-IR map, ISS trained its cameras on Skathi, one of Saturn's most distant satellites to measure its rotational light curve.

DOY 076 (17 March 2011): The first half of the day was primarily spent relaying data back to Earth. After the downlink, a UVIS EUV/FUV observation of Saturn followed.

DOY 077 (18 March 2011): A CIRS mid-IR map followed the UVIS EUV/FUV observation. Afterwards, ISS looked for lightning on Saturn, with VIMS observing in concert.

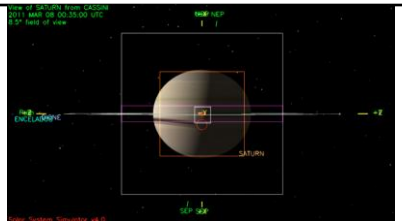
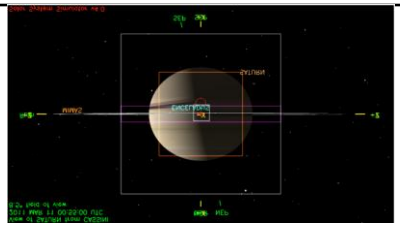
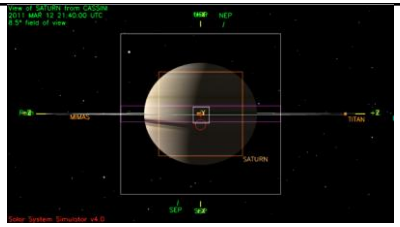
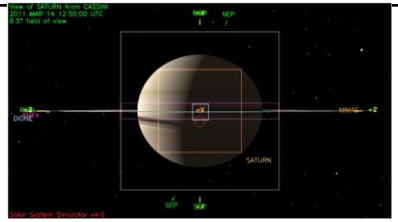
DOY 078 (19 March 2011): Following a downlink through the Goldstone 70-meter antenna, VIMS took a series of global mosaics of Saturn designed to study dynamics deep within Saturn's atmosphere. UVIS took another EUV/FUV observation from close range. This was followed by a CIRS mid-IR map that continues into the next day. RPWS prepared to survey the inner portion of the Saturnian magnetosphere.

DOY 079 (20 March 2011): As Cassini passed through periapse for this orbit, RADAR was taking a high-resolution global map of Saturn. CDA, RPWS and INMS prepared to observe the descending ring plane crossing.

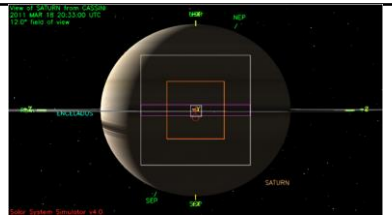
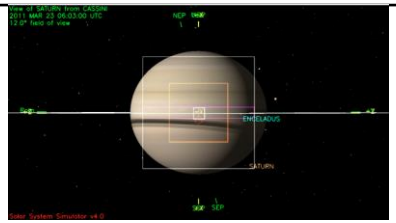
DOY 080 (21 March 2011): As DOY 080 began, VIMS followed up on its previous deep dynamics observation with a second set of deep dynamics mosaics of the day side of Saturn. UVIS came next with its second EUV/FUV of the periapse period.

Segment Integration Planning

Timeline Gaps and Suggested Observations (1 of 2)

Gap	Start	End	Duration	Phase angle (range)	Rs range	Sub-S/C Lat.	Snapshot (mid-gap)
1	2011-066T15:18:00	2011-067T09:53:00	18h 35m	55.8 to 56.2	34.09 to 34.45	0	
2	2011-070T00:13:00	2011-070T01:38:00	1h 25m	41.95 to 42.14	63.8 to 64	0	 *extend CIRS_146SA_COMPSIT003?*
3	2011-071T17:58:00	2011-072T01:23:00	7h 25m	47.74 to 47.83	69.9 to 70	0	
4	2011-073T11:13:00	2011-073T12:53:00	1h 40m	49.8 to 50.56	48.8 to 73.3	0	 *extend CIRS_146SA_COMPSIT005?*

Timeline Gaps and Suggested Observations (2 of 2)

Gap	Start	End	Duration	Phase angle (range)	Rs range	Sub-S/C Lat.	Snapshot (mid-gap)
5	2011-077T15:58:00	2011-078T02:38:00	9h 10m	54.13	83.7	0	 *CIRS or ISS?*
6	2011-080T05:45:00	2011-080T10:22:00	4h 37m	55.8 to 56.2	34.09 to 34.45	0	 *extend VIMS_146SA_DEEPDYN002_PIE and/or UVIS_146SA_EUVFUV002_PIE?*

Initial SMT and Data Volume

Beginning of Integration:

No Initial SMT Report Available.

Waypoint Selection

RBOT – Friendly (Primary is NEG_Y to Saturn Center)

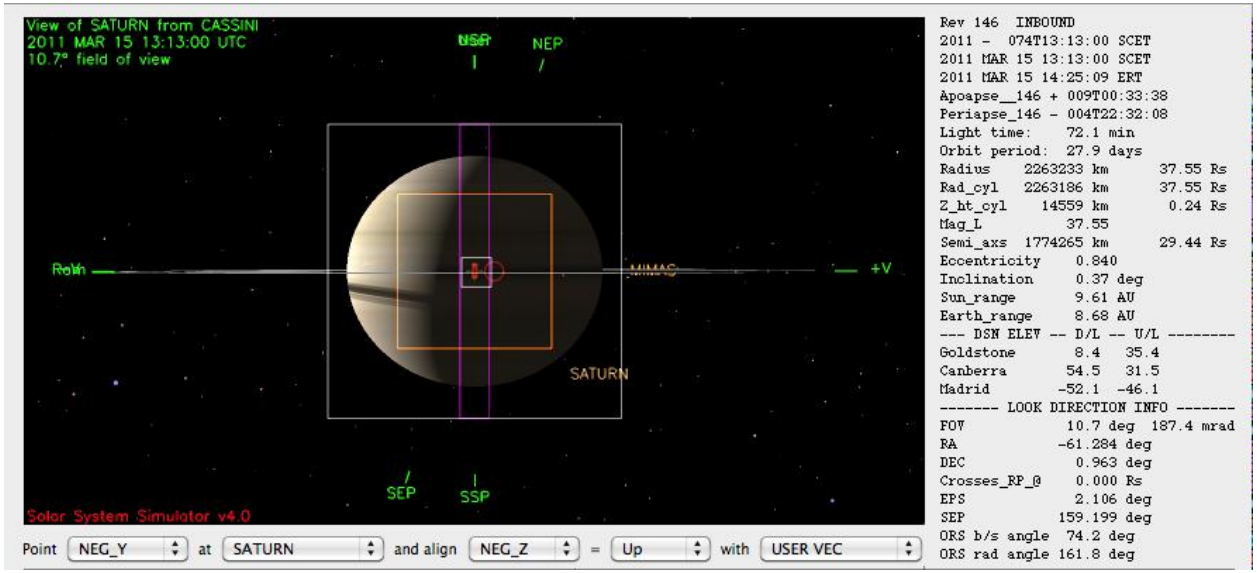
OBSERVATION PERIOD	START	END	POS_X	NEG_X	POS_Z	NEG_Z
SP_146NA_OBSERV068_NA	2011-068T13:03:00	2011-070T03:48:00	------	37.6/ 83.7	------	37.6/ 83.7
SP_146NA_OBSERV070_NA	2011-070T12:48:00	2011-072T03:33:00	------	37.5/ 83.7	------	37.5/ 83.7
SP_146NA_OBSERV072_NA	2011-072T12:33:00	2011-074T03:33:00	------	37.5/ 83.7	------	37.5/ 83.7
SP_146NA_OBSERV074_NA	2011-074T12:33:00	2011-076T03:18:00	------	37.5/ 83.7	------	37.5/ 83.7
SP_146NA_OBSERV076_NA	2011-076T12:18:00	2011-078T03:18:00	------	37.4/ 83.7	------	37.4/ 83.7
SP_146NA_OBSERV078_NA	2011-078T12:18:00	2011-080T19:33:00	------	37.4/ 83.7	------	37.4/ 83.7

Other Waypoints (Primary is NEG_Y to Saturn Center)

OBSERVATION PERIOD	START	END	POS_X_NSP	POS_X_NEP	NEG_X_NSP	NEG_X_NEP	POS_Z_NSP	POS_Z_NEP	NEG_Z_NSP	NEG_Z_NEP	NEG_X_SUN	NEG_Z_EARTH
SP_146NA_OBSERV068_NA	2011-068T13:03:00	2011-070T03:48:00	**BAD**	OK	OK	**BAD**	**BAD**	**BAD**	OK	OK	OK	OK
SP_146NA_OBSERV070_NA	2011-070T12:48:00	2011-072T03:33:00	**BAD**	OK	OK	**BAD**	**BAD**	**BAD**	OK	OK	OK	OK
SP_146NA_OBSERV072_NA	2011-072T12:33:00	2011-074T03:33:00	**BAD**	OK	OK	**BAD**	**BAD**	**BAD**	OK	OK	OK	OK
SP_146NA_OBSERV074_NA	2011-074T12:33:00	2011-076T03:18:00	**BAD**	OK	OK	**BAD**	**BAD**	**BAD**	OK	OK	OK	OK
SP_146NA_OBSERV076_NA	2011-076T12:18:00	2011-078T03:18:00	**BAD**	OK	OK	**BAD**	**BAD**	**BAD**	OK	OK	OK	OK
SP_146NA_OBSERV078_NA	2011-078T12:18:00	2011-080T19:33:00	**BAD**	**BAD**	**BAD**	**BAD**	**BAD**	**BAD**	**BAD**	**BAD**	**BAD**	**BAD**
SP_146NA_OBSERV080_NA	2011-081T04:33:00	2011-082T09:18:00	**BAD**	**BAD**	OK	OK	**BAD**	**BAD**	OK	OK	OK	OK

Waypoints Chosen (1 of 3)

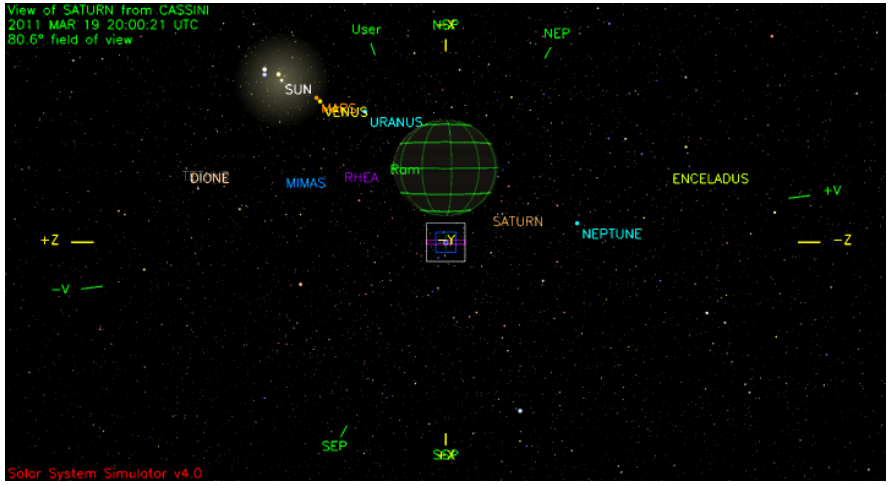
Waypoint 1: ISS_NAC to Saturn; Neg_Z to 37.5/83.7
Chosen for most of the segment (apoapse portion)



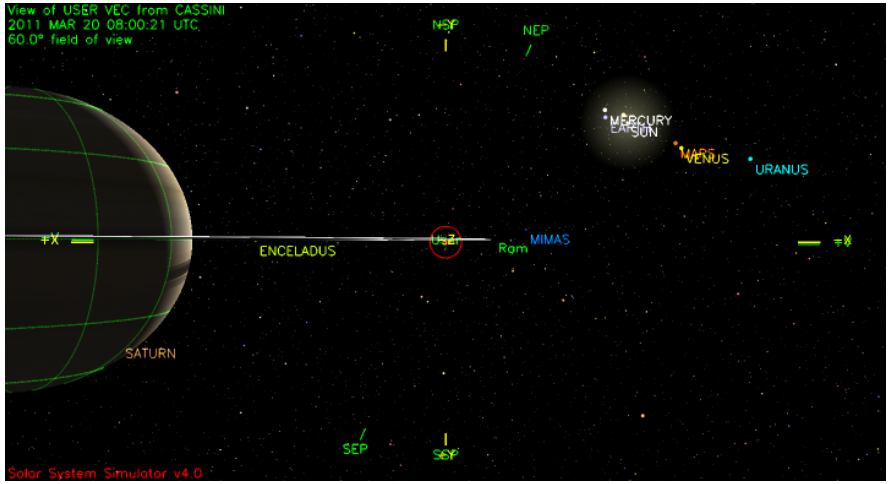
Note: an RA/Dec of 37.5/83.7 ~ NSP

Waypoints Chosen (2 of 3)

Waypoint 2 (2011-078T12:58:00– 079T03:40:00) ISS_NAC to Saturn (0,0,6.51); NEG_X to NSP

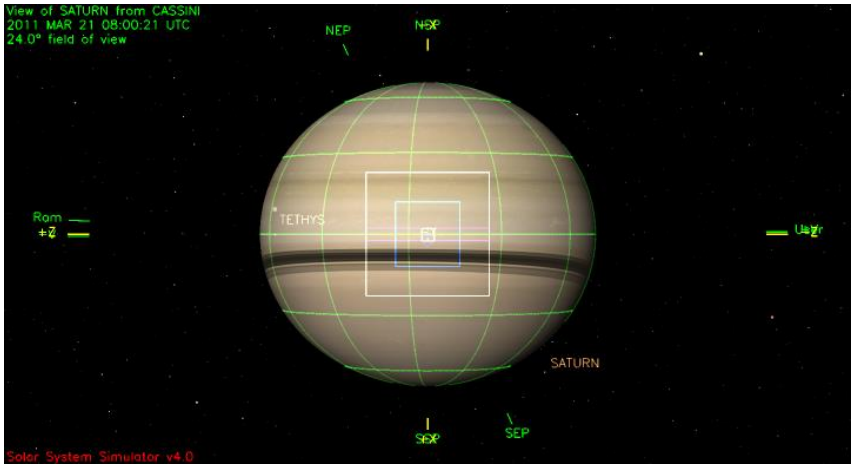


Waypoint 3 (2011-079T03:40:00 – 079T19:00): NEG_Z to 26.139/-6.213; NEG_Y to NSP



Waypoints Chosen (3 of 3)

Waypoint 4 (2011-079T19:00:00– 080T18:03:00) ISS_NAC to Saturn; NEG_X to NSP



Notes & Liens (1 of 2)

- Pointing:
  - Collaborative prime/rider coordination designs - The following observations have been identified as collaborative:
    - ISS_146SA_WIND5HR001_PRIME
    - ISS_146SA_WIND5HR001_PRIME
    - ISS_146SA_WIND5HR001_PRIME
    - ISS_146SA_WIND5HR001_PRIME
    - ISS_146SA_WIND5HR001_PRIME
    - ISS_146SA_WIND5HR001_PRIME
    - ISS_146SA_NALGTNG001_PRIME
  - >3 hr observations near periapse: <60 degrees target motion or inertial period lien added
    - This applies to RADAR_146SA_GLOBALMAP001_PIE. There will be 127° of target motion (Saturn) during this observation. RADAR has agreed to add bias windows as needed. SPLAT item entered.
  - Minor CIRS heating noted during the waypoint beginning at 2011-079T03:40:00.
  - All YBIAS windows precede the associated downlink
  - RBOT friendliness of delivery: RBOT secondaries used wherever possible.
- Data Volume:
  - none
- DSN:
  - This segment exceeds the 35% 70M station guideline for apoapse segments, but this includes two days of periapse. Without these periapse passes, it would be 40% (2 of 5).
- Opmodes:
  - RADAR will need the appropriate opmode to support their PIE on DOY 079

Notes & Liens (2 of 2)

- Special Activities:
  - CIRS will have an observation requiring a NEG_Y to Sun waiver, CIRS_146SA_COMPSIT007_PRIME. To avoid coming within 12˚ of the Sun, CIRS will stare at Saturn's southern pole. SPLAT item entered.

Sequence Liens:

- RBOT difficulties are anticipated during the period of the RADAR PIE on DOY 079. SP has left a gap of 35 minutes preceding this observation (Resource_Check000118). AACS should be notified of this quiescent period so that they can insert a gap if need be. SP would have liked to have found a suitable *inertial* pointing, but all such pointing required very long slews. To take advantage of this 35-minute gap, AACS may need to implement a custom hand-off period.
- SMT warnings: see https://cassini3.jpl.nasa.gov/cims/SMT?mode=200&smtid=307
  - SMT000099 – *I will personally compensate RADAR and the Cassini project to the tune of $1,000,000.00 per Mb for every Mb of data lost per this SMT error.* SMB, 07 September 2010
  - SMT000099,000100 – These SSR overages are well within allowed ranges.
  - SMT000101-000108 – These error messages arise because SMT doesn't know about the removal of P5 from the playback priority list. They can be ignored.
- Resource Check errors: see https://cassini3.jpl.nasa.gov/cims/ResourceChecker?mode=270&rcid=2219
  - Resource_check000109-000115 - These error messages arise because CIMS doesn't know about the removal of P5 from the playback priority list. They can be ignored.
  - Resource_check000116-000118 – These gaps are intentional.
  - Resource_check000116-000118 – ISS, UVIS to add correct secondaries (should be NEG_Z to 37.5/83.7) – *Note: UVIS has since updated their EUVFUV with the correct secondary.*