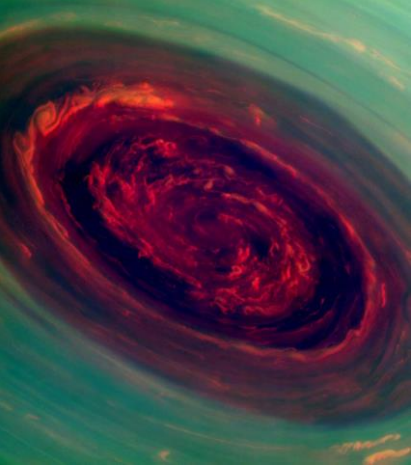

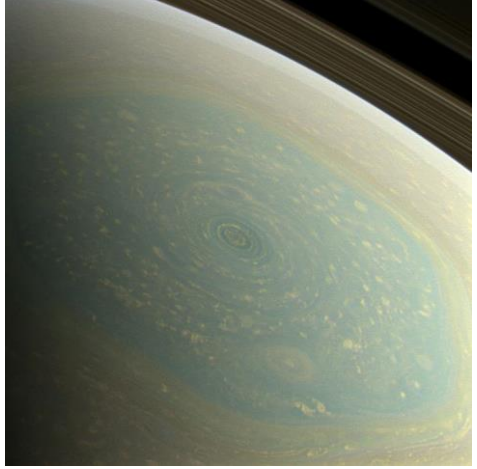
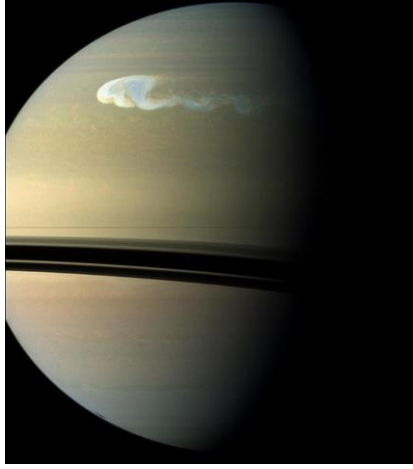

Science Planning & Sequence Team
CASSINI

SATURN TARGET WORKING TEAM

Rev 143_R3 Segment Legacy Package

Segment Boundary: January 09, 2011 – January 12, 2011
2011-009T09:11 – 2011-012T17:26 (SCET)

Integration Began 04/19/2010
Segment Delivered to S65 Sequence 06/07/2010
Lead Integrator was Nimisha Mittal

Legacy Package Assembled by Kyle Cloutier

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

Segment Overview and Final Products

Segment Summary

- Rev 143_R3 is an EQ1 periapse segment.
  - Saturn science included two high priority UVIS scans across Saturn's visible hemisphere to form spectral images (EUVFUV) and two stellar occultations to determine H/He ratio in the atmosphere. VIMS also made regional maps near the equator.
- A Rhea flyby (R3) occurred on DOY 011.
  - CAPS and the rest of the MAPS team investigated the interaction between Rhea and Saturn's magnetosphere. ISS created a global mosaic of regions of Rhea. ISS also attempted to image possible rings around Rhea
  - A custom period and a Ground Movable Block was used to sequence this flyby
  - A Dual Playback of Rhea Flyby data was performed

Final Sequenced SPASS

	Request	Riders	Start (SCET)	Start (Epoch)	Duration	End	Primary	Secondary	Comments
	"SATURN_143, Rhea Flyby R3"...		2011-009T09:11:00		003T08:15:00	2011-012T17:26:00			
	SP_143EA_WAYPTTURN009_PRIME		2011-009T09:11:00		000T00:38:00	2011-009T09:49:00	ISS_NAC to Saturn (0.0,0.0,15.0 deg. offset)	NEG_X to 41.0/83.6	Part 1 of 2 part turn.
	SP_143EA_WAYPTTURN409_PRIME		2011-009T09:49:00		000T00:06:00	2011-009T09:55:00	ISS_NAC to Saturn	NEG_X to 41.0/83.6	Part 2 of 2 part turn
	NEW WAYPOINT		**2011-009T09:55:00**		**000T13:16:00**	**2011-009T23:11:00**	**ISS_NAC to Saturn**	**NEG_X to 41.0/83.6**	
Gap 1	VIMS_143SA_REGMAP001_PRIME		2011-009T09:55:00		000T03:11:00	2011-009T13:06:00	ISS_NAC to Saturn	NEG_X to 41.0/83.6	
Gap 1	UVIS_143SA_EUVFUV001_PIE		2011-009T13:06:00		000T09:25:00	2011-009T22:31:00	UVIS_FUV to Saturn	NEG_X to 41.0/83.6	This is a PIE
	SP_143EA_DLTURN009_PRIME		2011-009T22:31:00		000T00:40:00	2011-009T23:11:00	XBAND to Earth	POS_X to NSP	
	NEW WAYPOINT		**2011-009T23:11:00**		**000T11:10:00**	**2011-010T10:21:00**	**XBAND to Earth**	**POS_X to NSP**	
	ENGR_143SC_KPTYBIAS009_PRIME		2011-009T23:11:00		000T01:30:00	2011-010T00:41:00	NEG_Z to DELTA_H (0.0,0.0,-62.001 deg. offset)	NEG_X to Sun	
	SP_143EA_M34BWGSEQ010_PRIME	C	2011-010T00:41:00		000T09:00:00	2011-010T09:41:00	XBAND to Earth	POS_X to NSP	NEG_X to NEP or NSP, CAPS - changed to allow a safe turn
	SP_143EA_WAYPTTURN010_PRIME		2011-010T09:41:00		000T00:40:00	2011-010T10:21:00	ISS_NAC to Saturn	NEG_X to 39.8/83.6	
	NEW WAYPOINT		**2011-010T10:21:00**		**001T19:35:00**	**2011-012T05:56:00**	**ISS_NAC to Saturn**	**NEG_X to 39.8/83.6**	
Gap 2	UVIS_143SA_EUVFUV002_PIE	M	2011-010T10:21:00		000T04:28:00	2011-010T14:49:00	UVIS_FUV to Saturn	NEG_X to 39.8/83.6	This is a PIE
Gap 2	VIMS_143SA_ALPCMAOCC001_PIE	C, I	2011-010T14:49:00		000T02:42:00	2011-010T17:31:00	CIRS_FPB to 101.287/-16.716	PIC	
Gap 3	Periapse R = 3.578 Rs, lat ...		2011-010T16:13:38		000T00:00:01	2011-010T16:13:39			
Gap 3	VIMS_143SA_RLEOOCC001_PIE	C, I	2011-010T17:31:00		000T02:30:00	2011-010T20:01:00	CIRS_FPB to 146.889/11.429	PIC	
Gap 4	VIMS_143SA_REGMAP002_PRIME	C	2011-010T20:01:00		000T07:52:00	2011-011T03:53:00	ISS_NAC to Saturn	NEG_X to 39.8/83.6	
Gap 4	SP_143SA_DEADTIME011_PRIME	M	2011-011T04:03:00		000T00:05:25	2011-011T04:08:25	ISS_NAC to Saturn	NEG_X to 39.8/83.6	
Gap 4	Begin Custom		2011-011T04:08:25		000T00:00:01	2011-011T04:08:26	ISS_NAC to Saturn	NEG_X to 39.8/83.6	
Gap 4	CAPS_143RH_RHEAPTG001_PIE	I, M, U	2011-011T04:08:25	GMB_E143_RHEA_R3-000T00:45:00	000T01:24:00	2011-011T05:32:25	NEG_X to Dust_RAM (40.0,0.0,0.0 deg. offset)	POS_Y to COROT	Pick up at ISS_NAC to Saturn, NEG_X to 39.8/83.6; Hand off at ISS_NAC to Rhea, NEG_X to 39.8/83.6. Collaborative
Gap 4	Begin Dual Playback Science		2011-011T04:20:25	GMB_E143_RHEA_R3-000T00:33:00	000T00:00:01	2011-011T04:20:26			
Gap 4	143RH (t) R3 RHEA Outboun...		2011-011T04:53:25		000T00:00:01	2011-011T04:53:26			
Gap 4	End Dual Playback Science		2011-011T05:26:25	GMB_E143_RHEA_R3+000T00:33:00	000T00:00:01	2011-011T05:26:26			
Gap 4	ISS_143RH_RHEA001_PIE	C, M, U	2011-011T05:32:25	GMB_E143_RHEA_R3+000T00:39:00	000T04:06:00	2011-011T09:38:25	ISS_NAC to Rhea	NEG_X to 39.8/83.6	Pick up at ISS_NAC to Rhea, NEG_X to 39.8/83.6; Hand off at ISS_NAC to Saturn, NEG_X to 39.8/83.6.
Gap 4	End Custom		2011-011T09:38:25		000T00:00:01	2011-011T09:38:26	ISS_NAC to Saturn	NEG_X to 39.8/83.6	
Gap 4	SP_143SA_DEADTIME411_PRIME		2011-011T09:38:25	GMB_E143_RHEA_R3+000T04:45:00	000T00:04:35	2011-011T09:43:00	ISS_NAC to Saturn	NEG_X to 39.8/83.6	
Gap 5	SP_143EA_DLTURN011_PRIME		2011-011T09:43:00		000T00:40:00	2011-011T10:23:00	XBAND to Earth	NEG_X to 281.664/47.792	add +45-degree offset to downlink per S65 RBOT strategy
Gap 5	SP_143EA_G70METNON011_PRIME	E	2011-011T10:23:00		000T02:48:00	2011-011T13:11:00	XBAND to Earth	NEG_X to 281.664/47.792	add +45-degree offset to downlink per S65 RBOT strategy
Gap 5	SP_143EA_C70METNON011_PRIME		2011-011T13:11:00		000T01:25:00	2011-011T14:36:00	XBAND to Earth	NEG_X to 281.664/47.792	add +45-degree offset to downlink per S65 RBOT strategy
Gap 5	SP_143EA_WAYPTTURN011_PRIME		2011-011T14:36:00		000T00:40:00	2011-011T15:16:00	ISS_NAC to Saturn	NEG_X to 39.8/83.6	
Gap 5	VIMS_143SA_REGMAP003_PRIME	C	2011-011T15:16:00		000T14:00:00	2011-012T05:16:00	ISS_NAC to Saturn	NEG_X to 39.8/83.6	
Gap 5	SP_143EA_DLTURN012_PRIME		2011-012T05:16:00		000T00:40:00	2011-012T05:56:00	XBAND to Earth	POS_X to NSP	
	NEW WAYPOINT		**2011-012T05:56:00**		**000T13:04:00**	**2011-012T19:00:00**	**XBAND to Earth**	**POS_X to NSP**	
	ENGR_143SC_KPTYBIAS012_PRIME		2011-012T05:56:00		000T01:30:00	2011-012T07:26:00	NEG_Z to DELTA_H	NEG_X to Sun	
	SP_143EA_G70METSEQ012_PRIME	C	2011-012T07:26:00		000T09:00:00	2011-012T16:26:00	XBAND to Earth	3_Hr_Rolling	POS_X to NEP or NSP, CAPS
	Pointer Reset in preparatio...		2011-012T16:26:00		000T00:00:01	2011-012T16:26:01			
	SP_143EA_C70METNON012_PRIME	C	2011-012T16:26:00		000T01:00:00	2011-012T17:26:00	XBAND to Earth	POS_X to NSP	POS_X to NEP or NSP, CAPS

Final Sequenced SMT and Data Volume

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

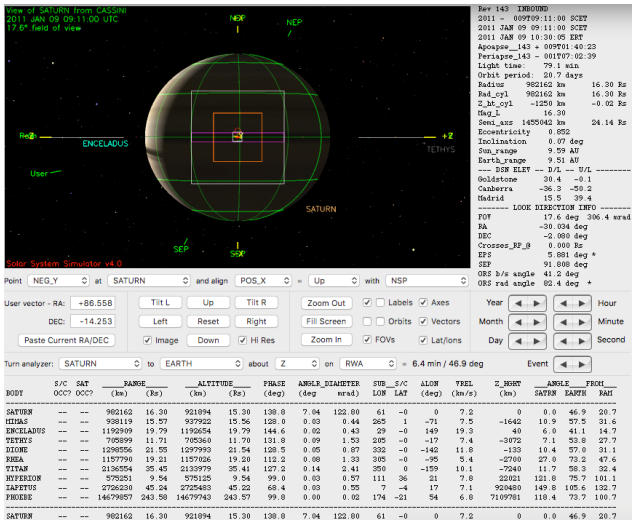
			OBSERVATION_PERIOD							DOWNLINK_PASS							
			P4						P5	RECORDED		PLAYBACK					
DOWNLINK PASS NAME	Start doy hh:mm	End doy hh:mm	START (Mb)	SCI (Mb)	HK+E (Mb)	TOTAL (Mb)	CPACTY (Mb)	MRGN (Mb)	OPNAV (Mb)	SCI (Mb)	ENGR (Mb)	TOTAL (Mb)	CPACTY (Mb)	MARGN (Mb)	NET_MARGN (Mb)	NET_MARGN (%)	CAROVR (Mb)
SP_143EA_M34BWGSEQ010_PRIME	010 00:41	010 09:41	3	765	65	834	3309	2475	0	289	53	1176	651	-525	-35	0%	525
SP_143EA_G70METNON011_PRIME	011 10:23	011 13:11	525	2673	122	3320	3309	-10	0	65	17	3390	1192	-2199	-35	0%	2198
SP_143EA_C70METNON011_PRIME	011 13:11	011 14:36	2198	0	0	2198	3309	1111	0	33	8	2239	389	-1850	-35	0%	1850
SP_143EA_G70METSEQ012_PRIME	012 07:26	012 16:26	1850	1424	71	3345	3309	-35	0	337	53	3699	3651	-49	1756	19%	48
SP_143EA_C70METNON012_PRIME	012 16:26	012 17:26	48	0	0	48	3309	3261	0	419	6	473	431	-42	1756	30%	42

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	009 09:11	010 00:41	55.8	99.7	0.0	5.6	165.0	27.6	33.5	0.0	50.2	170.9	150.0	0.0	64.8	822.9
SP_143EA_M34BWGSEQ010_PRIME	010 00:41	010 09:41	32.4	84.9	86.4	13.3	0.0	16.0	19.4	0.0	29.2	4.7	0.0	0.0	0.0	286.3
DAILY TOTAL SCIENCE	009 09:11	010 09:41	88.2	184.6	86.4	18.9	165.0	43.6	52.9	0.0	79.4	175.5	150.0	0.0	64.8	
OBSERVATION_NOR	010 09:41	011 10:23	196.9	233.0	221.3	39.1	769.9	77.6	62.2	0.0	427.4	121.5	500.0	0.0	120.9	2769.7
SP_143EA_G70METNON011_PRIME	011 10:23	011 13:11	10.1	26.4	0.0	1.0	0.0	5.0	8.6	0.0	13.1	0.0	0.0	0.0	0.0	64.1
SP_143EA_C70METNON011_PRIME	011 13:11	011 14:36	5.1	13.4	0.0	0.5	0.0	2.5	4.3	0.0	6.6	0.0	0.0	0.0	0.0	32.5
DAILY TOTAL SCIENCE	010 09:41	011 14:36	212.1	272.7	221.3	40.6	769.9	85.1	75.1	0.0	447.1	121.5	500.0	0.0	120.9	
OBSERVATION_NOR	011 14:36	012 07:26	60.6	50.7	100.8	6.1	140.0	29.9	51.5	0.0	221.5	0.0	750.0	0.0	70.4	1481.5
SP_143EA_G70METSEQ012_PRIME	012 07:26	012 16:26	32.4	17.0	86.4	3.2	0.0	16.0	27.5	0.0	146.1	4.9	0.0	0.0	0.0	333.6
SP_143EA_C70METNON012_PRIME	012 16:26	012 17:26	3.6	1.9	10.8	0.4	0.0	1.8	3.1	0.0	4.7	0.0	0.0	0.0	389.5	415.7
DAILY TOTAL SCIENCE	011 14:36	012 17:26	96.6	69.6	198.0	9.7	140.0	47.7	82.1	0.0	372.3	4.9	750.0	0.0	459.8	

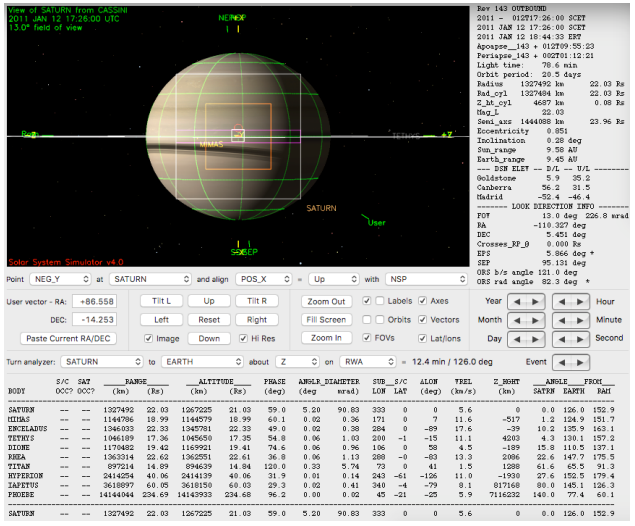
Segment Geometry

Segment Start: 2011-009T09:11



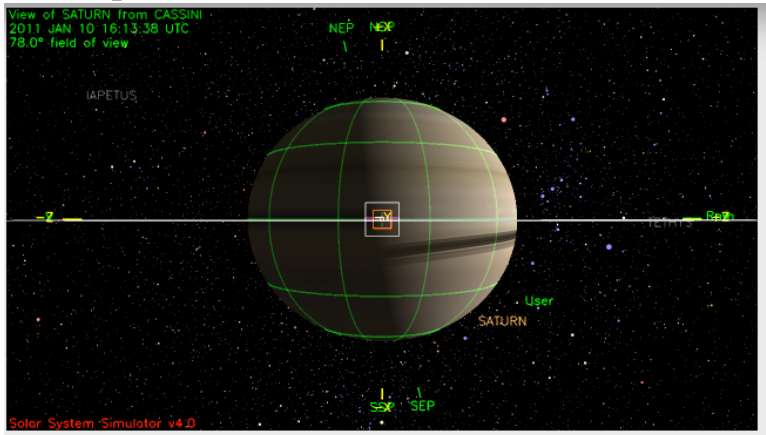
BODY	S/C OCC?	SAT OCC?	RANGE (km)	RANGE (Rs)	ALTITUDE (km)	ALTITUDE (Rs)	PHASE (deg)	ANGLR DIAMETER (deg)	ANGLR DIAMETER (mrad)	SUB S/C LON	SUB S/C LAT	ALON (deg)	VREL (km/s)	Z_HGHT (km)	ANGLE FROM SATRN	ANGLE FROM EARTH	ANGLE FROM RAM
SATURN	--	--	982162	16.30	921094	15.30	138.8	7.04	122.80	61	-0	0	7.2	0	0.0	46.9	20.7
MIMAS	--	--	938119	15.57	937922	15.56	128.0	0.03	0.44	265	1	-71	7.5	-1642	10.9	57.5	31.6
ENCELADUS	--	--	1192909	19.79	1192654	19.79	144.6	0.02	0.43	29	-0	149	19.3	40	6.0	41.1	14.7
TETHYS	--	--	705899	11.71	705360	11.70	131.8	0.09	1.53	205	-0	-17	7.4	-3072	7.1	53.8	27.7
DIONE	--	--	1298556	21.55	1297993	21.54	128.5	0.05	0.87	332	-0	-142	11.8	-133	10.4	57.0	31.1
RHEA	--	--	1157790	19.21	1157026	19.20	112.2	0.08	1.33	305	-0	-95	5.4	-2700	27.0	73.2	47.6
TITAN	--	--	2136554	35.45	2133979	35.41	127.2	0.14	2.41	350	0	-159	10.1	-7240	11.7	58.3	32.4
HYPERION	--	--	575251	9.54	575125	9.54	99.0	0.03	0.57	111	36	21	7.0	22021	121.0	75.7	101.1
IAPETUS	--	--	2726230	45.24	2725483	45.22	68.4	0.03	0.55	7	-4	17	7.1	920480	149.8	105.6	132.7
PHOEBE	--	--	14679857	243.58	14679743	243.57	99.8	0.00	0.02	174	-21	54	6.8	7109781	118.4	73.7	100.7
SATURN	--	--	982162	16.30	921094	15.30	138.8	7.04	122.80	61	-0	0	7.2	0	0.0	46.9	20.7

Segment End: 2011-012T17:26



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	--	--	1327492	22.03	1267225	21.03	59.0	5.20	90.83	333	0	0	5.6	0	0.0	126.0	152.9
MIMAS	--	--	1144786	18.99	1144579	18.99	60.1	0.02	0.36	171	0	7	11.6	-517	1.2	124.9	151.7
ENCELADUS	--	--	1346033	22.33	1345781	22.33	49.0	0.02	0.38	284	0	-89	17.6	-39	10.2	135.9	163.1
TETHYS	--	--	1046109	17.36	1045650	17.35	54.8	0.06	1.03	200	-1	-15	11.1	4203	4.3	130.1	157.2
DIONE	--	--	1170482	19.42	1169921	19.41	74.6	0.06	0.96	106	0	58	4.5	-189	15.8	110.5	137.1
RHEA	--	--	1363314	22.62	1362551	22.61	36.8	0.06	1.13	288	-0	-83	13.3	2086	22.6	147.7	175.5
TITAN	--	--	897214	14.89	894639	14.84	120.0	0.33	5.74	73	0	41	1.5	1288	61.6	65.5	91.3
HYPERION	--	--	2414254	40.06	2414139	40.06	31.9	0.01	0.14	243	-61	-126	11.0	-1930	27.6	152.5	179.4
IAPETUS	--	--	3618897	60.05	3618150	60.03	29.3	0.02	0.41	340	-4	-79	8.1	817168	80.0	145.1	126.3
PHOEBE	--	--	14144044	234.69	14143933	234.68	96.2	0.00	0.02	45	-21	-25	5.9	7116232	140.0	77.4	60.1
SATURN	--	--	1327492	22.03	1267225	21.03	59.0	5.20	90.83	333	0	0	5.6	0	0.0	126.0	152.9

Periapse: 2011-010T16:13:38



Rev 143 INBOUND
2011 - 010T16:13:38 SCET
2011 JAN 10 16:13:38 SCET
2011 JAN 10 17:32:30 ERT
Apoapse__143 + 010T08:43:01
Periapse_143 - 00:00:01
Light time: 78.9 min
Orbit period: 21.0 days
Radius 215870 km 3.58 Rs
Rad_cyl 215869 km 3.58 Rs
Z_ht_cyl 197 km 0.00 Rs
Mag_L 3.58
Semi_axs 1467108 km 24.34 Rs
Eccentricity 0.853
Inclination 0.07 deg
Sun_range 9.59 AU
Earth_range 9.49 AU
--- DSN ELEV -- D/L -- U/L --------
Goldstone 21.6 46.0
Canberra 45.5 15.4
Madrid -53.3 -34.3
------- LOOK DIRECTION INFO ------
FOV 78.0 deg 1361.3 mra
RA 104.440 deg
DEC -2.910 deg
Crosses_RF_@ 0.000 Rs
EPS 5.879 deg *
SEP 93.052 deg
ORS b/s angle 93.5 deg
ORS rad angle 82.3 deg *

Point NEG_Y at SATURN and align POS_X = Up with NSP

User vector - RA: +86.558 DEC: -14.253 | Tilt L Up Tilt R / Left Reset Right | Zoom Out Fill Screen Zoom In | Labels Axes Orbits Vectors Lat/lons FOVs | Year Month Day Hour Minute Second | Paste Current RA/DEC | Image Down Hi Res

Turn analyzer: SATURN to EARTH about Z on RWA = 9.5 min / 88.2 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	--	--	215870	3.58	155602	2.58	86.5	32.42	565.90	256	0	0	18.0	0	0.0	88.2	90.0
MIMAS	--	--	238591	3.96	238391	3.96	133.0	0.10	1.74	301	-1	-73	19.6	4348	46.9	42.1	43.1
ENCELADUS	--	--	217540	3.61	217286	3.61	152.2	0.14	2.36	307	0	-57	15.3	39	66.8	23.6	23.2
TETHYS	--	--	463070	7.68	462531	7.67	115.7	0.13	2.33	339	0	-130	26.7	5525	29.4	59.2	60.6
DIONE	--	--	593806	9.85	593242	9.84	87.9	0.11	1.90	359	-0	-178	28.1	104	1.4	86.8	88.6
RHEA	--	--	475003	7.88	474237	7.87	171.8	0.19	3.23	339	0	-64	16.3	-1261	91.4	10.9	1.5
TITAN	--	--	1078470	17.89	1075895	17.85	156.9	0.27	4.78	349	0	-55	15.5	-4846	115.3	28.9	25.3
HYPERION	--	--	1508165	25.02	1508003	25.02	42.9	0.01	0.22	172	-12	129	21.9	14599	44.3	131.4	134.2
IAPETUS	--	--	3792100	62.92	3791353	62.91	57.2	0.02	0.39	2	1	145	20.8	887474	35.3	116.8	121.8
PHOEBE	--	--	15365502	254.95	15365391	254.95	97.2	0.00	0.01	297	-19	-172	16.6	7113043	28.8	76.3	82.6
SATURN	--	--	215870	3.58	155602	2.58	86.5	32.42	565.90	256	0	0	18.0	0	0.0	88.2	90.0

	Saturn Range	Phase Angle	Sub-S/C Lat.
Segment Start	16.30 Rs	138.8 deg	0
Periapse	3.58 Rs	86.5 deg	0
Segment End	22.03 Rs	59.0 deg	0

Solar Geometry – ORS Boresight Concerns

No ORS Boresight Solar Constraints on Science Pointing Noted.

Daily Science Highlights

Jan 9 (DOY 9): VIMS made a regional map of Saturn to look for and characterize meteorological features and equatorial plumes. This was followed by a high priority UVIS scan across Saturn's visible hemisphere to form spectral images.

Jan 10 (DOY 10): UVIS performed another high priority scan across Saturn's visible hemisphere to form spectral images. A collaborative VIMS and CIRS PIE observed Saturn's atmosphere in stellar occultation mode (as the star Alpha CMa, commonly known as Sirius, was occulted) to gather data to determine the H/He ratio in the atmosphere. This was followed by another collaborative PIE between these instruments to continue these observations as the star R Leo was occulted by Saturn just after Cassini approached periapse.

Jan 11 (DOY 11): As part of MAPS high priority Rhea Campaign, CAPS controlled the pointing for the MAPS teams to investigate the interaction between Rhea and Saturn's magnetosphere as Cassini made a close approach to Rhea. ISS conducted high priority science in the four hours that followed, making a global mosaic of regions such as the large Tirawa basin, any fresh craters, and the equatorial dark bluish spots. It then attempted to image the largest chunks of the hypothetical rings around Rhea.

Jan 12 (DOY 12): VIMS continued making a regional map of Saturn near the equator to investigate equatorial plumes.

Segment Integration Planning

Timeline Gaps and Suggested Observations

- GAP 1 (2011-009T09:51:00 to 2011-009T18:00:00 - Duration 8h 9m)
  - VIMS HIRES observation
  - Others?
- GAP 2 (2011-010T12:00:00 to 2011-010T14:49:00 - Duration 2h 49m)
  - UVIS_143SA_EUVFUV002_PIE to take first 30 minutes of GAP? Gap 1 will then start at 2011-010T12:30:00 (Duration 2 h 19 m)
- GAP 3 (2011-010T17:19:00 to 2011-010T17:31:00 – Duration 12m)
  - Give the time to VIMS_143SA_ALPCMAOCC001_PIE and/or VIMS_143SA_RLEOOCC001_PIE ?
- GAP 4 (2011-010T20:01:00 to 2011-011T04:08:00 – Duration 8h 7m)
  - VIMS HIRES observation?
  - Others?
- GAP 5 (2011-011T09:38:00 to 2011-012T05:16:00 – Duration 19h 38m)
  - Short downlink?
  - VIMS HIRES observation?
  - Others?

Initial SMT and Data Volume

Beginning of Integration:

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_143EA_M34BWGSEQ010_PRIME	010 00:41	010 09:41	0	765	65	831	3317	2487	0	289	53	1173	651	-522	53	1%	522
SP_143EA_G70METNON011_PRIME	011 10:23	011 14:36	522	2621	122	3264	3317	53	0	97	25	3387	1814	-1574	353	6%	1573
SP_143EA_G70METSEQ012_PRIME	012 07:26	012 16:26	1573	1320	71	2964	3317	353	0	232	53	3249	3651	401	800	20%	0
SP_143EA_C70METNON012_PRIME	012 16:26	012 17:26	0	0	0	0	3317	3317	0	26	6	32	431	399	399	93%	0

Waypoint Selection

RBOT FRIENDLY WAYPOINTS

PRIMARY : NEG_Y to SATURN

reminder: use an ra/dec average value and keep the same waypoint throughout your segment when possible

OBSERVATION PERIOD	START	END	POS_X	NEG_X	POS_Z	NEG_Z
SP_143NA_OBSERV009_NA	2011-009T09:11:00	2011-010T00:41:00	-----	41.0/ 83.6	-----	41.0/ 83.6
SP_143NA_OBSERV010_NA	2011-010T09:41:00	2011-012T07:26:00	-----	39.8/ 83.6	-----	-----

OTHER WAYPOINTS

PRIMARY : NEG_Y to SATURN

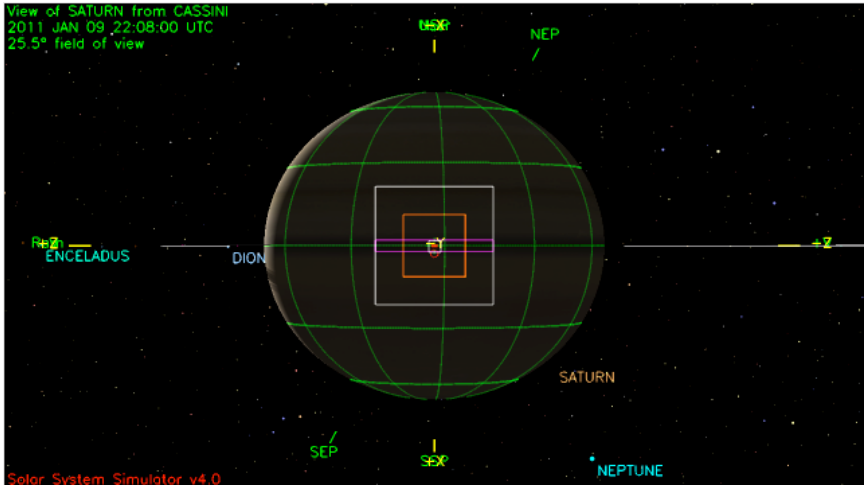
OBSERVATION PERIOD	START	END	POS_X_2_NSP	POS_X_2_NEP	NEG_X_2_NSP	NEG_X_2_NEP	POS_Z_2_NSP	POS_Z_2_NEP	NEG_Z_2_NSP	NEG_Z_2_NEP	NEG_X_2_SUN	NEG_Z_2_EARTH
SP_143NA_OBSERV009_NA	2011-009T09:11:00	2011-010T00:41:00	**BAD**	OK	OK	**BAD**	**BAD**	**BAD**	OK	OK	OK	OK
SP_143NA_OBSERV010_NA	2011-010T09:41:00	2011-012T07:26:00	**BAD**	**BAD**	OK	**BAD**	**BAD**	**BAD**	**BAD**	**BAD**	OK	**BAD**

EQ-1 DOWNLINKS ATTITUDE SUMMARY ROLLING+SRU SAFETY SUMMARY

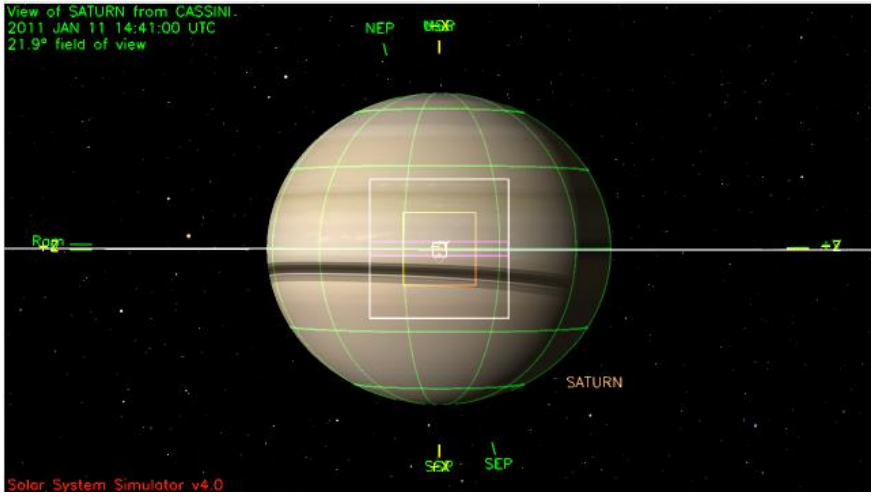
OBS_NAME	START	END	POS_X_2_NSP	POS_X_2_NEP	NEG_X_2_NSP	NEG_X_2_NEP	POS_Y_2_NSP	POS_Y_2_NEP	NEG_Y_2_NSP	NEG_Y_2_NEP	ROLL_FLAG
SP_143EA_M34BWGOTB008_PRIME	2011-009T00:11:00	2011-009T09:11:00	OK	OK	OK	OK	**BAD**	**BAD**	OK	OK	OK
SP_143EA_M70METSEQ009_PRIME	2011-010T00:11:00	2011-010T09:11:00	OK	OK	OK	OK	**BAD**	**BAD**	OK	OK	OK

Waypoints Chosen

Waypoint 1 (2011-009T09:55 – 010T10:21): NAC to Saturn, NEG_X to 41.0/83.6



Waypoint 2 (2011-010T10:21 – 012T19:00): NAC to Saturn, NEG_X to 39.8/83.6



NOTE: Custom handoff from CAPS to ISS during mini-SOST segment 011T04:08:25 – 011T09:38:25

Notes & Liens (1/3)

- Pointing:
  - Collaborative primes
    - VIMS_143SA_ALPCMAOCC001_PIE
    - CAPS_143RH_RHEAPTG001_PIE
    - ISS_143RH_RHEA001_PIE
  - Custom handoff from CAPS to ISS during mini-SOST segment
    - CAPS_143RH_RHEAPTG001_PIE
    - ISS_143RH_RHEA001_PIE
  - 2 part waypoint turn – total turn time 44 mins (with new XXM margin)
    - SP_143EA_WAYPTTURN009_PRIME
    - SP_143EA_WAYPTTURN409_PRIME
  - Near 180 degree turn
    - SP_143EA_DLTURN012_PRIME
    - Changed secondary attitude to POS_X TO NSP (originally POS_X to NEP)
  - Ybias window not added for SP_143EA_G70METNON011_PRIME downlink (downlink pass shorter than 5 hours)
  - CAPS preferred secondary attitude of Neg_X to NSP during SP_143EA_M34BWGSEQ010 had to be changed to Pos_X to NSP to allow a safe turn
  - RBOT friendly waypoint secondaries used for all observations except
    - CAPS_143RH_RHEAPTG001_PIE for which the secondary was science driven
    - VIMS_143SA_ALPCMAOCC001_PIE and VIMS_143SA_RLEOOCC001_PIE list PIC for their secondary attitudes – flexibility provided on next page.
- Data Volume:
  - Added SP_143EA_G70METNON011_PRIME to allow teams accommodate data from Rhea flyby
  - Dual playback of Rhea data during the 1 hour SP_143EA_C70METNON012_PRIME pass
- DSN: None
- Opmodes: None
- Special Activities:
  - SID suspend - will be activated during the 10 minute gap between VIMS_143SA_REGMAP002_PRIME and SP_143SA_DEADTIME011_PRIME. Will be un-suspended during a quiescent period during ISS_143RH_RHEA001_PIE

Notes & Liens (2/3)

Sequence Liens:

- Information on the flexibility of secondary attitudes for RBOT is being provided by teams.

Observation	Response
VIMS_143SA_ALPCMAOCC001_PIE And For VIMS_143SA_RLEOOCC001_PIE	For VIMS_143SA_ALPCMAOCC001_PIE the stellar occultation occurs at 60S on the dark limb. A 60 degree rotation is needed from the waypoint secondary (NEG_X to NSP = NEG_X to 39.8/83.6). The CIRS limb integration, which takes place later in this observation, will probably have to take place at 60 South on the bright limb to avoid radiator constraints or a 120-degree turn. For VIMS_143SA_RLEOOCC001_PIE the stellar occultation occurs at 40N on the dark limb. A 40 degree rotation is needed from the waypoint secondary. The CIRS limb integration can take place on the dark limb in this case. The VIMS PDT designer may have to interact with Amy on the subtleties of limb sounding. However, we cannot simply use the waypoint secondary. –Gordy Bjoraker
ISS_143RH_RHEA001_PIE	Our secondary is completely free NOW. If the secondary will be changed during RBOT, we might or will run into these problems: - The turn from CAPS to ISS might need more time than available => a CIMS change would be needed. - A secondary change for the ISS Rhea PIE would require a complete PDT re-design of the whole observation. We might do this, but would strongly prefer not getting asked for. This would be a huge effort to be done at very short notice. From science viewpoint, we might "tolerate" any secondary, but from the re-designing effort, it would be hard to do. --Tilmann

Notes & Liens (3/3)

Sequence Liens:

- Information on the flexibility of secondary attitudes for RBOT is being provided by teams.

Observation	Response
VIMS_143SA_REGMAP001_PRIME VIMS_143SA_REGMAP002_PRIME VIMS_143SA_REGMAP003_PRIME	We can actually take any orientation. BUT: We prefer orientations that align the z-axis (or x-axis) within 5 degrees of either Saturn's equator or its polar axis (with near-perfect alignment being preferred, especially for equatorial orbits). --Kevin Baines
UVIS_143SA_EUVFUV001_PIE UVIS_143SA_EUVFUV002_PIE	As a rule I select the secondary to be the same as the waypoint secondary. The EUVFUV are flexible. – Bob West
CAPS_143RH_RHEAPTG001_PIE	There is little to no flexibility, since the second axis was selected to satisfy CAPS, CDA, INMS, MIMI and to drag the ORS fields of view over Rhea at closest approach. –Frank Crary

Dual Playback (R3)

Flyby	Driving Instrument	BEGHIVAL	ENDHIVAL	P4 Dual Playback	Carryover?	Fits in Existing Margin?
R3	CAPS	R3-00:33:00	R3+00:33:00	389.5 Mb	No	Yes

Reminder - ALL instruments' data is played back twice during P4 dual playback periods
In addition to the P4 dual playback, SCO/AACS has asked for P6 playback for the flyby