

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-02T20:31:28.240
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4069720175703253248
 2Mass ID (if available) : 18085642-2219472

Saturn 2047-06-02T20:31:28 K9.92 G13.95 PgtRgt

ICRS Star Coord at Epoch: 18h 08m 56.42600s -22:19:47.54212s

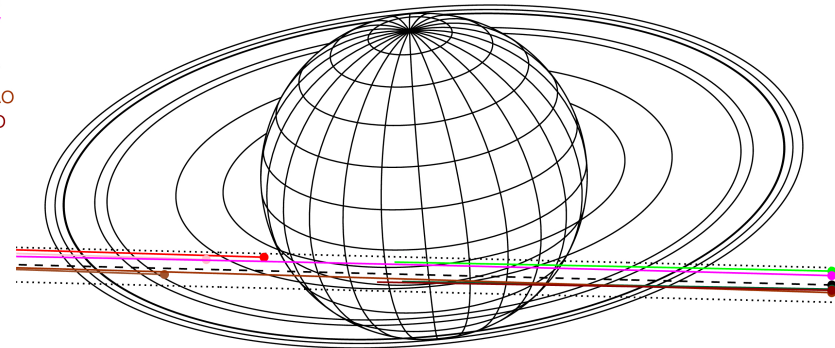
RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.921
 G magnitude : 13.947
 RP magnitude : 12.853
 BP magnitude : 15.165
 DUPflag : 0
 Distance (au) : 9.090
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.29
 Sun-Target sep (deg) : 159.50
 Sun-Moon sep (deg) : 92.82
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.68
 # a(km) ring

Saturn 2047-06-02T20:31:28 K9.92 G13.95
 PgtRgt



2047-06-02T20:31:28.2400 at: 18 08 56.42600 s: -22 19 47.542 C/A 5.505° PA 358.58 deg v_sky -18.29 km/s D 09.09 AU
 Credit: Styled after SORA/Lucky Star

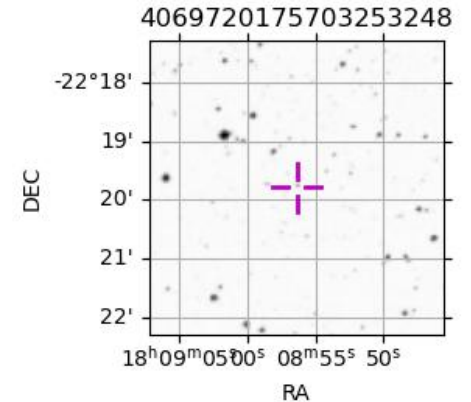
Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 AAT
 SAAO
 MSO



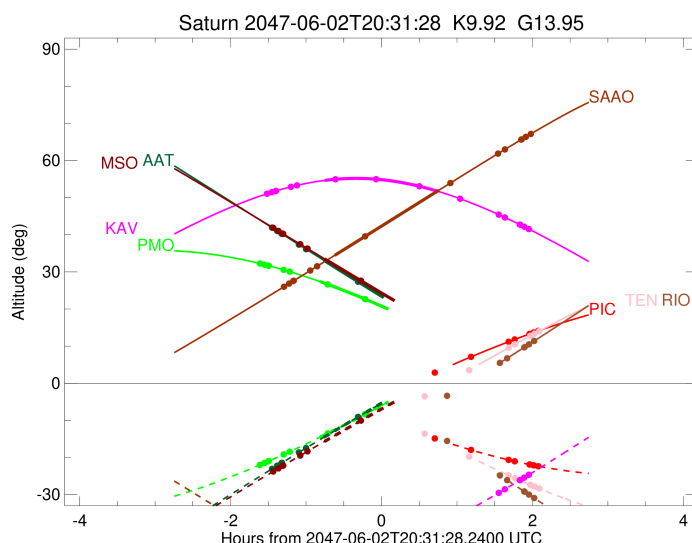
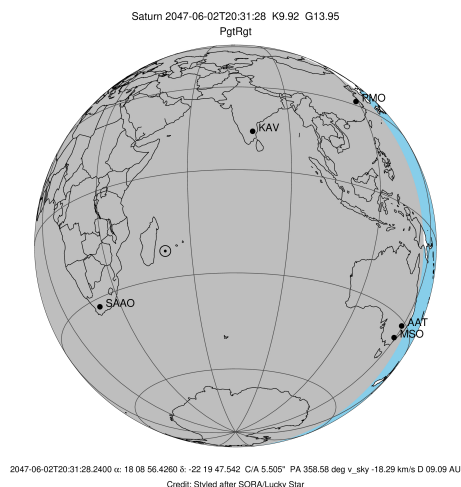
- 1 74490.6 C (IER)
- 2 91984.7 B (IER)
- 3 117571.2 B (OER)
- 4 122050.4 A (IER)
- 5 133423.3 Encke (IEG)
- 6 133744.9 Encke (OEG)
- 7 136774.4 A (OER)
- 8 140461.0 F ring

Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1			+	JUN 02 21:42 - JUN 02 22:36	PnnRne
PAL	Palomar Mt (20	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs	32.1	118.8	+	+		JUN 02 18:54 - JUN 02 19:42	PinRin
KPNO	Kitt Peak Natl	32.0	248.4					PnnRnn
MCD	McDonald Obs.	30.7	256.0					PnnRnn
TEN	Teide Obs./Ten	28.3	343.5			+	JUN 02 22:12 - JUN 02 22:36	PnnRne
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observ	12.6	78.8	+	+	+	JUN 02 19:00 - JUN 02 22:28	PieRie
RIO	Rio de Janeiro	-22.9	316.8			+	JUN 02 22:05 - JUN 02 22:32	PnnRne
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1	+	+		JUN 02 19:04 - JUN 02 19:45	PinRin
SAAO	So. Afr. Astro	-32.4	20.8	+	+	+	JUN 02 19:13 - JUN 02 22:30	PieRie
MSO	Mt. Stromlo Ob	-35.3	149.0	+	+	+	JUN 02 19:05 - JUN 02 19:46	PinRin



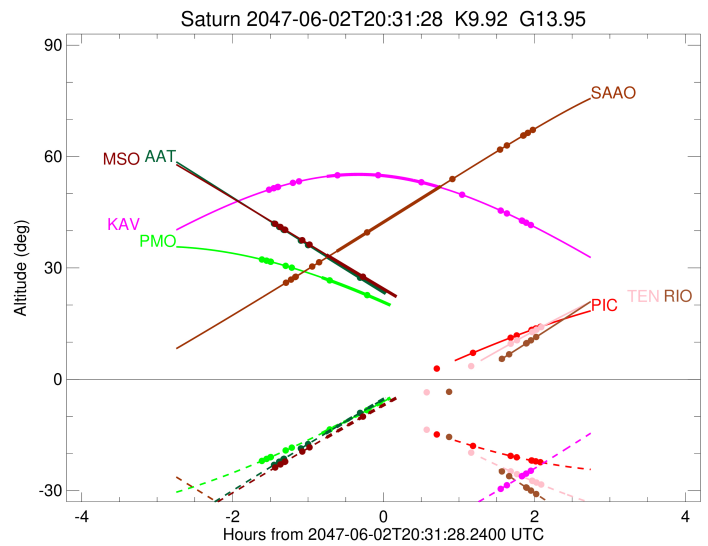
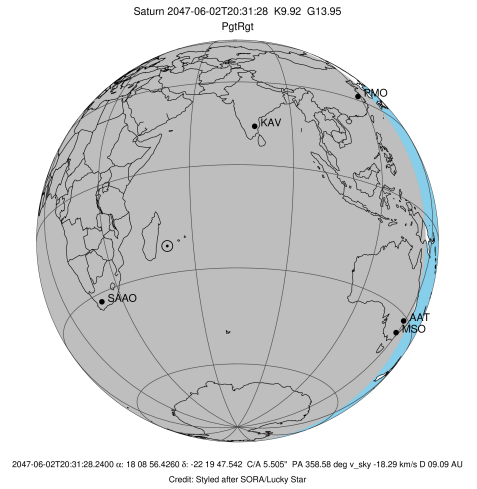
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-02T20:35:36.180
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 4069720175703253248
 2Mass ID (if available) : 18085642-2219472
 ICRS Star Coord at Epoch: 18h 08m 56.42600s -22:19:47.54212s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.921
 G magnitude : 13.947
 RP magnitude : 12.853
 BP magnitude : 15.165
 DUPflag : 0
 Distance (au) : 9.090
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.29
 Sun-Target sep (deg) : 159.50
 Sun-Moon sep (deg) : 92.79
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.68
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.798
 C/A sky separation (km) : 31631.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-06-02T19:02:26.042		-19.19x	3.83x	140461.00	-16.43		
A (OER)	I	2047-06-02T19:06:11.308		-18.52x	3.22x	136774.40	-16.29		
Encke (OEG)	I	2047-06-02T19:09:17.929		-17.96x	2.71x	133744.89	-16.17		
Encke (IEG)	I	2047-06-02T19:09:37.824		-17.90x	2.66x	133423.31	-16.16		
A (IER)	I	2047-06-02T19:21:33.895		-15.78x	0.75x	122050.38	-15.58		
B (OER)	I	2047-06-02T19:26:23.958		-14.93x	-0.01x	117571.16	-15.30		
B (IER)	I	2047-06-02T19:56:43.050	b	-9.66x	-4.64x	91984.69	-12.48		
C (IER)	I	2047-06-02T20:25:50.417	b	-4.75x	-8.80	74490.58	-6.97		
Saturn	I	2047-06-02T19:49:31.973		-10.89x	-3.57x	59814.51		-34.70	-40.18
Saturn	E	2047-06-02T21:21:46.314		4.07x	-15.76	60075.49		-21.69	-25.98
C (IER)	E	2047-06-02T21:13:53.055	b	2.88x	-14.87	74490.58	7.05		
B (IER)	E	2047-06-02T21:42:41.121		7.12	-17.96	91984.69	12.61		
B (OER)	E	2047-06-02T22:12:38.571		11.19	-20.65	117571.16	15.51		
A (IER)	E	2047-06-02T22:17:24.619		11.81	-21.02	122050.38	15.81		
Encke (IEG)	E	2047-06-02T22:29:09.991		13.27	-21.88	133423.31	16.41		
Encke (OEG)	E	2047-06-02T22:29:29.572		13.31	-21.90	133744.89	16.43		
A (OER)	E	2047-06-02T22:32:33.210		13.68	-22.11	136774.40	16.56		
F ring	E	2047-06-02T22:36:14.769		14.13	-22.35	140461.00	16.71		

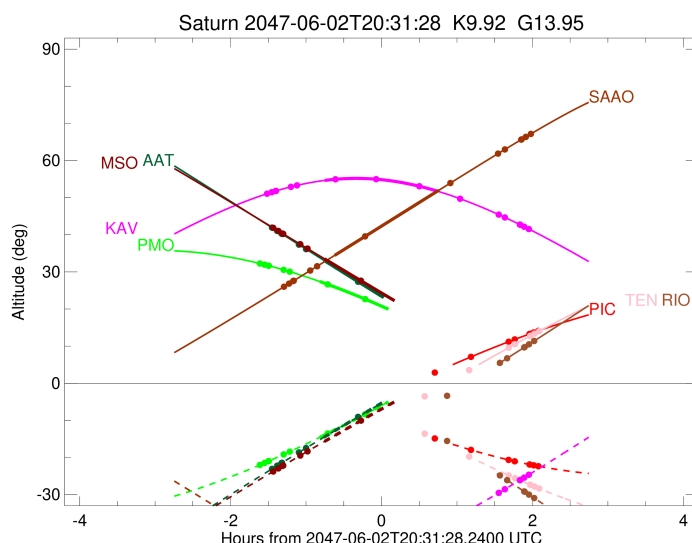
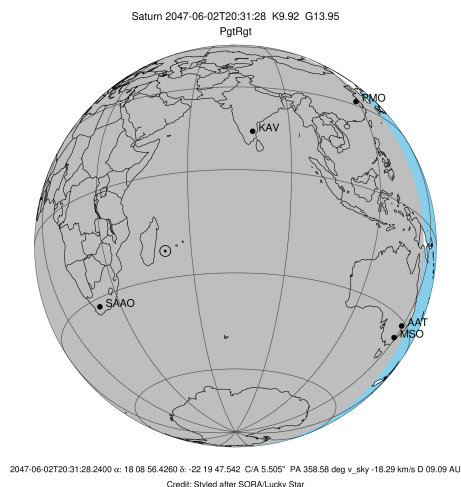
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-02T20:27:44.560
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 4069720175703253248
 2Mass ID (if available) : 18085642-2219472
 ICRS Star Coord at Epoch: 18h 08m 56.42600s -22:19:47.54212s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.921
 G magnitude : 13.947
 RP magnitude : 12.853
 BP magnitude : 15.165
 DUPflag : 0
 Distance (au) : 9.090
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.29
 Sun-Target sep (deg) : 159.50
 Sun-Moon sep (deg) : 93.14
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.68
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.826
 C/A sky separation (km) : 31816.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-06-02T18:54:49.873		32.26	-21.99	140461.00	-16.67		
A (OER)	I	2047-06-02T18:58:32.044		31.95	-21.45	136774.40	-16.52		
Encke (OEG)	I	2047-06-02T19:01:36.240		31.68	-21.00	133744.89	-16.38		
Encke (IEG)	I	2047-06-02T19:01:55.884		31.65	-20.95	133423.31	-16.36		
A (IER)	I	2047-06-02T19:13:43.970		30.54	-19.17	122050.38	-15.73		
B (OER)	I	2047-06-02T19:18:31.433		30.06	-18.42	117571.16	-15.43		
B (IER)	I	2047-06-02T19:48:46.192	b	26.63	-13.51	91984.69	-12.41		
C (IER)	I	2047-06-02T20:18:44.217	b	22.63	-8.30	74490.58	-6.45		
Saturn	I	2047-06-02T19:42:21.162		27.41	-14.58	59824.01		-34.27	-39.74
Saturn	E	2047-06-02T21:13:30.466		14.11	1.87x	60061.25		-22.53	-26.93
C (IER)	E	2047-06-02T21:02:52.528	b	15.87	-0.16x	74490.58	6.48		
B (IER)	E	2047-06-02T21:32:51.886		10.80	5.62x	91984.69	12.34		
B (OER)	E	2047-06-02T22:03:23.282		5.33	11.67x	117571.16	15.24		
A (IER)	E	2047-06-02T22:08:14.329		4.44x	12.65x	122050.38	15.53		
Encke (IEG)	E	2047-06-02T22:20:12.193		2.21x	15.07x	133423.31	16.12		
Encke (OEG)	E	2047-06-02T22:20:32.127		2.15x	15.13x	133744.89	16.14		
A (OER)	E	2047-06-02T22:23:39.089		1.56x	15.77x	136774.40	16.27		
F ring	E	2047-06-02T22:27:24.711		0.85x	16.53x	140461.00	16.41		

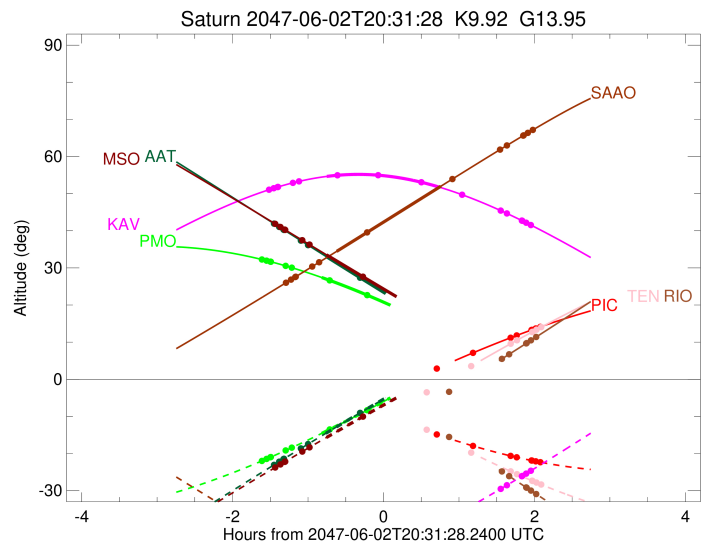
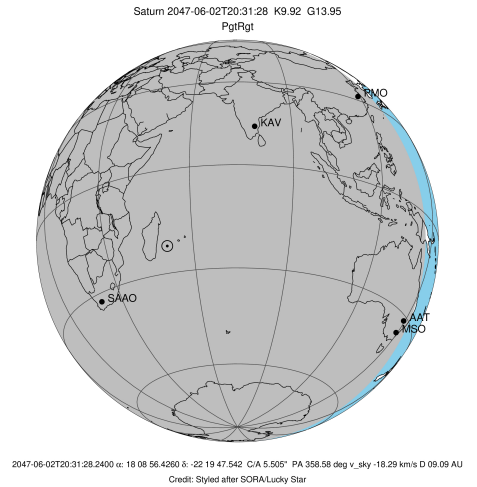
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-02T20:36:46.270
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 4069720175703253248
 2Mass ID (if available) : 18085642-2219472
 ICRS Star Coord at Epoch: 18h 08m 56.42600s -22:19:47.54212s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.921
 G magnitude : 13.947
 RP magnitude : 12.853
 BP magnitude : 15.165
 DUPflag : 0
 Distance (au) : 9.090
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.29
 Sun-Target sep (deg) : 159.50
 Sun-Moon sep (deg) : 92.68
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.68
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.052
 C/A sky separation (km) : 33308.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-06-02T19:05:54.687		-28.79x	9.89x	140461.00	-16.05		
A (OER)	I	2047-06-02T19:09:45.513		-27.95x	9.09x	136774.40	-15.89		
Encke (OEG)	I	2047-06-02T19:12:56.967		-27.26x	8.43x	133744.89	-15.75		
Encke (IEG)	I	2047-06-02T19:13:17.391		-27.19x	8.36x	133423.31	-15.74		
A (IER)	I	2047-06-02T19:25:34.465		-24.54x	5.84x	122050.38	-15.09		
B (OER)	I	2047-06-02T19:30:34.386		-23.46x	4.82x	117571.16	-14.77		
B (IER)	I	2047-06-02T20:02:31.213	b	-16.65x	-1.58x	91984.69	-11.51		
C (IER)	I	2047-06-02T20:38:23.347	b	-9.14x	-8.52	74490.58	-3.96		
Saturn	I	2047-06-02T19:51:28.486		-19.00x	0.61x	59775.45		-36.41	-41.96
Saturn	E	2047-06-02T21:22:08.939		-0.23x	-16.50	60048.21		-23.27	-27.77
C (IER)	E	2047-06-02T21:05:49.301	b	-3.51x	-13.60	74490.58	3.99		
B (IER)	E	2047-06-02T21:41:14.798		3.55x	-19.78	91984.69	11.67		
B (OER)	E	2047-06-02T22:12:42.375		9.59	-24.83	117571.16	15.04		
A (IER)	E	2047-06-02T22:17:36.876		10.51	-25.57	122050.38	15.38		
Encke (IEG)	E	2047-06-02T22:29:39.504		12.74	-27.34	133423.31	16.07		
Encke (OEG)	E	2047-06-02T22:29:59.504		12.80	-27.39	133744.89	16.09		
A (OER)	E	2047-06-02T22:33:06.928		13.37	-27.83	136774.40	16.24		
F ring	E	2047-06-02T22:36:52.749		14.05	-28.36	140461.00	16.41		

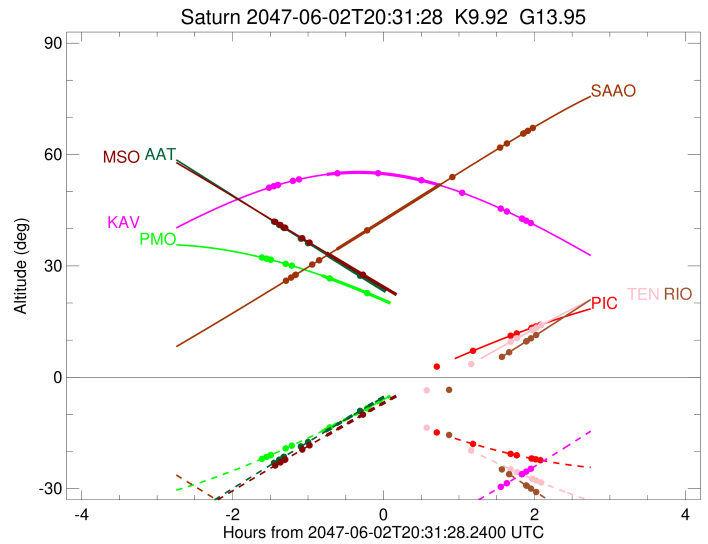
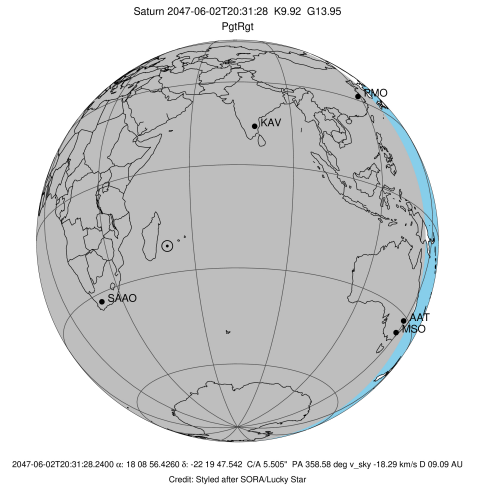
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-02T20:30:50.810
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 4069720175703253248
 2Mass ID (if available) : 18085642-2219472
 ICRS Star Coord at Epoch: 18h 08m 56.42600s -22:19:47.54212s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.921
 G magnitude : 13.947
 RP magnitude : 12.853
 BP magnitude : 15.165
 DUPflag : 0
 Distance (au) : 9.090
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.29
 Sun-Target sep (deg) : 159.50
 Sun-Moon sep (deg) : 93.62
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.68
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.957
 C/A sky separation (km) : 32677.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-06-02T19:00:30.961		51.06	-54.98	140461.00	-16.65		
A (OER)	I	2047-06-02T19:04:13.502		51.46	-54.86	136774.40	-16.48		
Encke (OEG)	I	2047-06-02T19:07:18.077		51.78	-54.74	133744.89	-16.34		
Encke (IEG)	I	2047-06-02T19:07:37.766		51.82	-54.72	133423.31	-16.32		
A (IER)	I	2047-06-02T19:19:28.166		52.92	-54.10	122050.38	-15.66		
B (OER)	I	2047-06-02T19:24:17.075		53.31	-53.79	117571.16	-15.34		
B (IER)	I	2047-06-02T19:54:56.148	b	54.95	-51.00	91984.69	-12.09		
C (IER)	I	2047-06-02T20:27:30.159	b	54.97	-46.79	74490.58	-5.11		
Saturn	I	2047-06-02T19:46:20.351		54.65	-51.91	59799.72		-35.35	-40.86
Saturn	E	2047-06-02T21:15:37.665		51.78	-38.89	60049.88		-23.18	-27.66
C (IER)	E	2047-06-02T21:01:35.856	b	53.07	-41.35	74490.58	5.14		
B (IER)	E	2047-06-02T21:34:03.071		49.70	-35.49	91984.69	12.08		
B (OER)	E	2047-06-02T22:04:46.734		45.42	-29.51	117571.16	15.28		
A (IER)	E	2047-06-02T22:09:36.884		44.67	-28.54	122050.38	15.59		
Encke (IEG)	E	2047-06-02T22:21:30.768		42.74	-26.11	133423.31	16.24		
Encke (OEG)	E	2047-06-02T22:21:50.561		42.69	-26.05	133744.89	16.25		
A (OER)	E	2047-06-02T22:24:56.138		42.17	-25.41	136774.40	16.39		
F ring	E	2047-06-02T22:28:39.936		41.53	-24.64	140461.00	16.55		

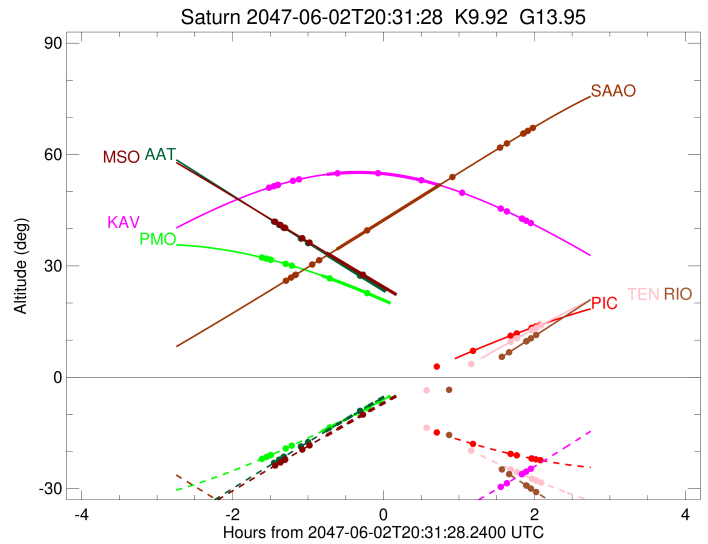
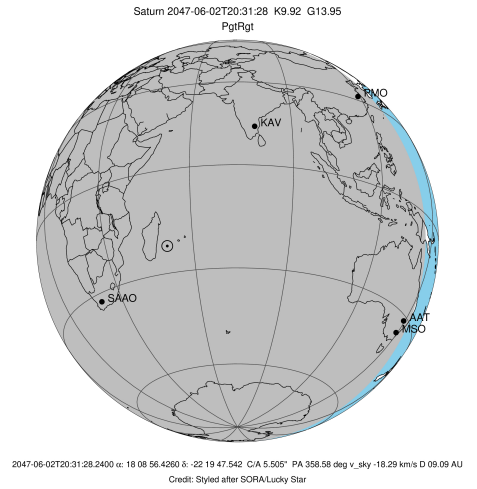
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-02T20:36:41.000
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 4069720175703253248
 2Mass ID (if available) : 18085642-2219472
 ICRS Star Coord at Epoch: 18h 08m 56.42600s -22:19:47.54212s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.921
 G magnitude : 13.947
 RP magnitude : 12.853
 BP magnitude : 15.165
 DUPflag : 0
 Distance (au) : 9.090
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.29
 Sun-Target sep (deg) : 159.50
 Sun-Moon sep (deg) : 92.62
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.68
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.974
 C/A sky separation (km) : 39384.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-06-02T19:15:45.169		-27.84x	11.40x	140461.00	-14.67		
A (OER)	I	2047-06-02T19:19:58.489		-27.13x	10.56x	136774.40	-14.43		
Encke (OEG)	I	2047-06-02T19:23:29.943		-26.52x	9.85x	133744.89	-14.22		
Encke (IEG)	I	2047-06-02T19:23:52.578		-26.46x	9.78x	133423.31	-14.19		
A (IER)	I	2047-06-02T19:37:41.870		-24.04x	6.98x	122050.38	-13.19		
B (OER)	I	2047-06-02T19:43:28.140		-23.01x	5.80x	117571.16	-12.67		
B (IER)	I	2047-06-02T20:26:07.218	b	-14.99x	-3.12x	91984.69	-6.57		
Saturn	I	2047-06-02T19:55:23.212		-20.83x	3.34x	59631.99		-42.51	-48.11
Saturn	E	2047-06-02T21:18:09.690		-4.51x	-14.35	59923.66		-29.69	-34.86
B (IER)	E	2047-06-02T21:23:44.648		-3.35x	-15.57	91984.69	6.65		
B (OER)	E	2047-06-02T22:05:45.804		5.53	-24.86	117571.16	12.90		
A (IER)	E	2047-06-02T22:11:25.791		6.75	-26.12	122050.38	13.44		
Encke (IEG)	E	2047-06-02T22:24:58.572		9.67	-29.15	133423.31	14.50		
Encke (OEG)	E	2047-06-02T22:25:20.727		9.75	-29.23	133744.89	14.53		
A (OER)	E	2047-06-02T22:28:47.611		10.50	-30.00	136774.40	14.76		
F ring	E	2047-06-02T22:32:55.268		11.40	-30.93	140461.00	15.01		

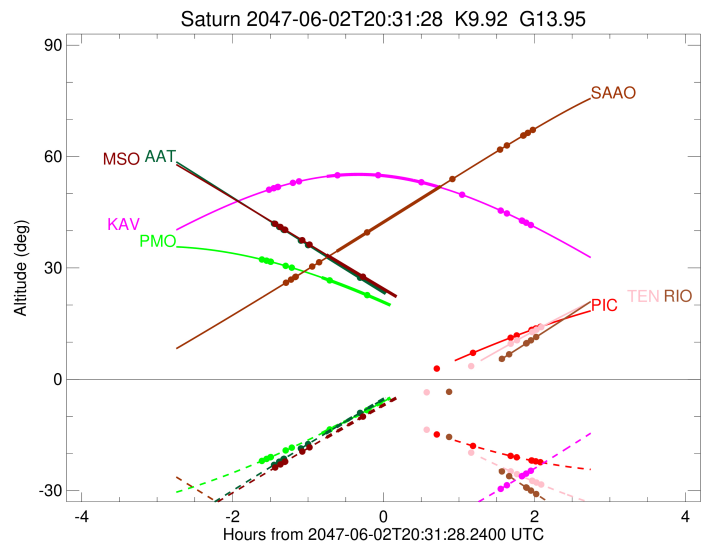
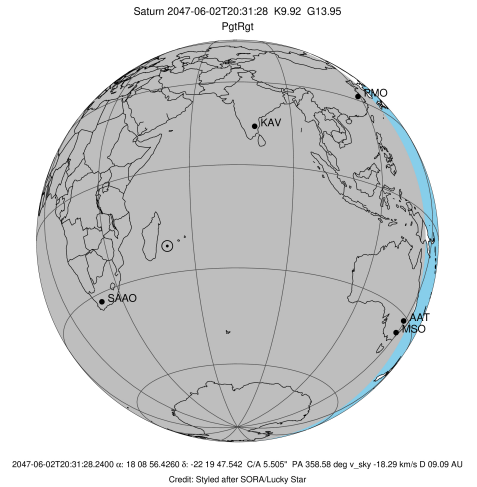
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-02T20:26:28.470
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 4069720175703253248
 2Mass ID (if available) : 18085642-2219472
 ICRS Star Coord at Epoch: 18h 08m 56.42600s -22:19:47.54212s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.921
 G magnitude : 13.947
 RP magnitude : 12.853
 BP magnitude : 15.165
 DUPflag : 0
 Distance (au) : 9.090
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.29
 Sun-Target sep (deg) : 159.50
 Sun-Moon sep (deg) : 93.17
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.68
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.904
 C/A sky separation (km) : 38924.3
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-06-02T19:04:27.881		41.92	-23.06	140461.00	-15.09		
A (OER)	I	2047-06-02T19:08:34.233		41.04	-22.20	136774.40	-14.84		
Encke (OEG)	I	2047-06-02T19:11:59.976		40.30	-21.49	133744.89	-14.61		
Encke (IEG)	I	2047-06-02T19:12:22.005		40.22	-21.41	133423.31	-14.59		
A (IER)	I	2047-06-02T19:25:49.771		37.34	-18.62	122050.38	-13.53		
B (OER)	I	2047-06-02T19:31:27.383		36.14	-17.47	117571.16	-13.00		
B (IER)	I	2047-06-02T20:12:57.944	b	27.33	-9.03	91984.69	-6.82		
Saturn	I	2047-06-02T19:45:35.474		33.13	-14.57	59661.19		-41.28	-46.90
Saturn	E	2047-06-02T21:07:48.502		15.90	1.69x	59916.66		-30.03	-35.22
B (IER)	E	2047-06-02T21:11:47.274		15.09	2.44x	91984.69	6.82		
B (OER)	E	2047-06-02T21:53:34.475		6.64	10.11x	117571.16	12.84		
A (IER)	E	2047-06-02T21:59:16.537		5.51	11.12x	122050.38	13.34		
Encke (IEG)	E	2047-06-02T22:12:56.641		2.82x	13.49x	133423.31	14.35		
Encke (OEG)	E	2047-06-02T22:13:19.039		2.75x	13.56x	133744.89	14.37		
A (OER)	E	2047-06-02T22:16:48.299		2.07x	14.15x	136774.40	14.58		
F ring	E	2047-06-02T22:20:59.047		1.26x	14.86x	140461.00	14.82		

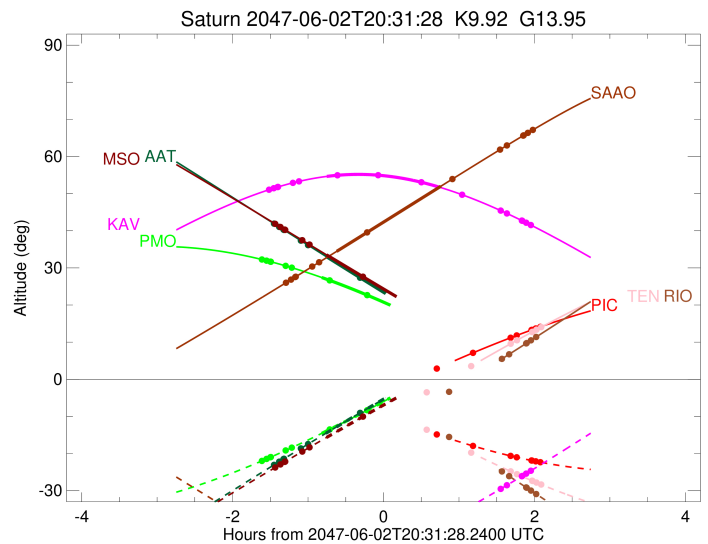
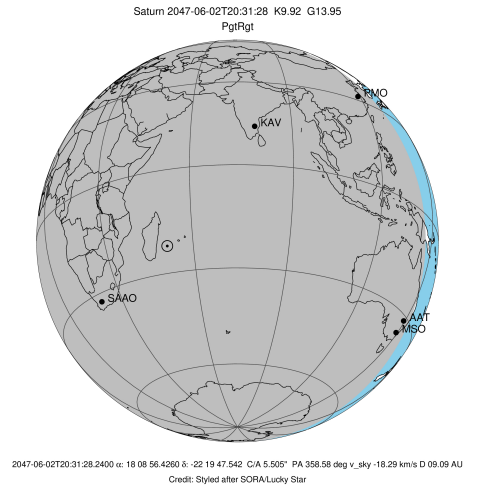
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-02T20:35:35.820
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 4069720175703253248
 2Mass ID (if available) : 18085642-2219472
 ICRS Star Coord at Epoch: 18h 08m 56.42600s -22:19:47.54212s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.921
 G magnitude : 13.947
 RP magnitude : 12.853
 BP magnitude : 15.165
 DUPflag : 0
 Distance (au) : 9.090
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.29
 Sun-Target sep (deg) : 159.50
 Sun-Moon sep (deg) : 93.53
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.68
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.771
 C/A sky separation (km) : 38046.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-06-02T19:13:58.275		26.01	-44.68	140461.00	-15.36		
A (OER)	I	2047-06-02T19:18:00.025		26.85	-45.53	136774.40	-15.14		
Encke (OEG)	I	2047-06-02T19:21:21.501		27.55	-46.24	133744.89	-14.93		
Encke (IEG)	I	2047-06-02T19:21:43.049		27.63	-46.32	133423.31	-14.91		
A (IER)	I	2047-06-02T19:34:49.474		30.37	-49.09	122050.38	-13.97		
B (OER)	I	2047-06-02T19:40:15.624		31.51	-50.24	117571.16	-13.49		
B (IER)	I	2047-06-02T20:18:33.453	b	39.59	-58.28	91984.69	-8.12		
Saturn	I	2047-06-02T19:54:13.337		34.45	-53.18	59666.75		-41.04	-46.66
Saturn	E	2047-06-02T21:17:09.923		52.02	-70.14	59950.60		-28.39	-33.44
B (IER)	E	2047-06-02T21:26:21.126		53.96	-71.87	91984.69	8.19		
B (OER)	E	2047-06-02T22:04:16.631		61.89	-77.98	117571.16	13.62		
A (IER)	E	2047-06-02T22:09:39.284		63.00	-78.60	122050.38	14.12		
Encke (IEG)	E	2047-06-02T22:22:36.602		65.64	-79.70	133423.31	15.10		
Encke (OEG)	E	2047-06-02T22:22:57.886		65.72	-79.72	133744.89	15.12		
A (OER)	E	2047-06-02T22:26:16.853		66.38	-79.88	136774.40	15.33		
F ring	E	2047-06-02T22:30:15.498		67.18	-80.01	140461.00	15.56		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-02T20:26:42.640
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MSO
 Location : Mt. Stromlo Observatory
 Latitude (deg) : -35.32000
 E. Longitude (deg) : 149.00833
 Altitude (km) : 0.770
 Gaia source ID : 4069720175703253248
 2Mass ID (if available) : 18085642-2219472
 ICRS Star Coord at Epoch: 18h 08m 56.42600s -22:19:47.54212s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.921
 G magnitude : 13.947
 RP magnitude : 12.853
 BP magnitude : 15.165
 DUPflag : 0
 Distance (au) : 9.090
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.29
 Sun-Target sep (deg) : 159.50
 Sun-Moon sep (deg) : 93.19
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.68
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.960
 C/A sky separation (km) : 39289.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-06-02T19:05:24.302		41.86	-23.76	140461.00	-15.00		
A (OER)	I	2047-06-02T19:09:32.211		41.02	-22.93	136774.40	-14.74		
Encke (OEG)	I	2047-06-02T19:12:59.352		40.31	-22.24	133744.89	-14.51		
Encke (IEG)	I	2047-06-02T19:13:21.537		40.23	-22.17	133423.31	-14.48		
A (IER)	I	2047-06-02T19:26:55.967		37.45	-19.47	122050.38	-13.40		
B (OER)	I	2047-06-02T19:32:37.076		36.29	-18.34	117571.16	-12.85		
B (IER)	I	2047-06-02T20:15:15.455	b	27.60	-10.03	91984.69	-6.39		
Saturn	I	2047-06-02T19:46:06.637		33.53	-15.69	59651.74		-41.68	-47.29
Saturn	E	2047-06-02T21:07:45.380		17.09	-0.22x	59908.57		-30.41	-35.64
B (IER)	E	2047-06-02T21:10:21.454		16.57	0.25x	91984.69	6.39		
B (OER)	E	2047-06-02T21:53:14.792		8.25	7.76x	117571.16	12.71		
A (IER)	E	2047-06-02T21:59:00.109		7.15	8.72x	122050.38	13.23		
Encke (IEG)	E	2047-06-02T22:12:46.246		4.56x	10.99x	133423.31	14.26		
Encke (OEG)	E	2047-06-02T22:13:08.780		4.49x	11.05x	133744.89	14.28		
A (OER)	E	2047-06-02T22:16:39.265		3.83x	11.62x	136774.40	14.50		
F ring	E	2047-06-02T22:20:51.355		3.05x	12.29x	140461.00	14.74		