

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T04:47:46.470
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4090688893238936704
 2Mass ID (if available) : 18150591-2217401

Saturn 2047-05-07T04:47:46 K6.71 G11.71 PgtRgt

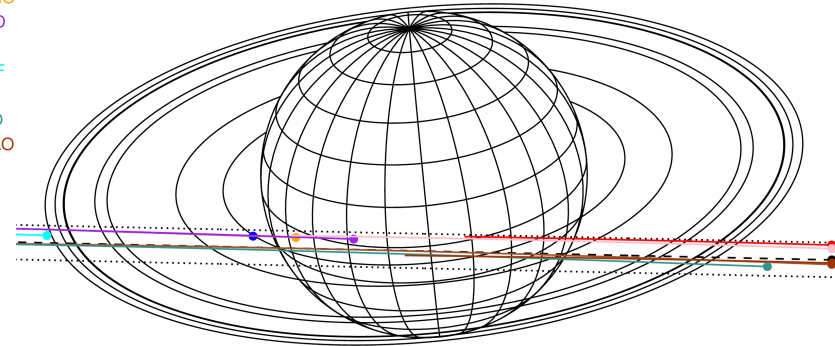
ICRS Star Coord at Epoch: 18h 15m 05.92458s -22:17:40.07039s

RUWE (>1.4 is poor) : 0.81
 K magnitude : 6.715
 G magnitude : 11.707
 RP magnitude : 10.398
 BP magnitude : 13.693
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.50
 Sun-Target sep (deg) : 132.42
 Sun-Moon sep (deg) : 84.24
 B (ring opening deg) : 26.09
 PA of pole (deg) : 5.79



2047-05-07T04:47:46.4700 at: 18 15 05.9246 s: -22 17 40.070 C/A 4.174° PA 358.75 deg v_sky -10.50 km/s D 09.34 AU
 Credit: Styled after SORA/Lucky Star

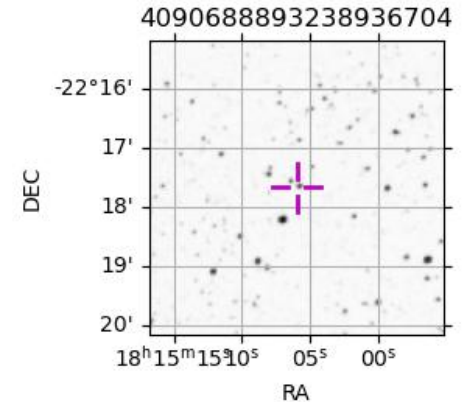
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO



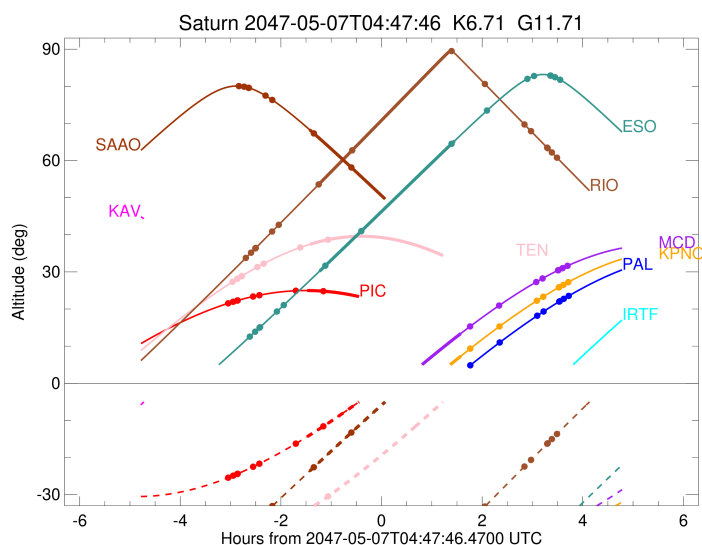
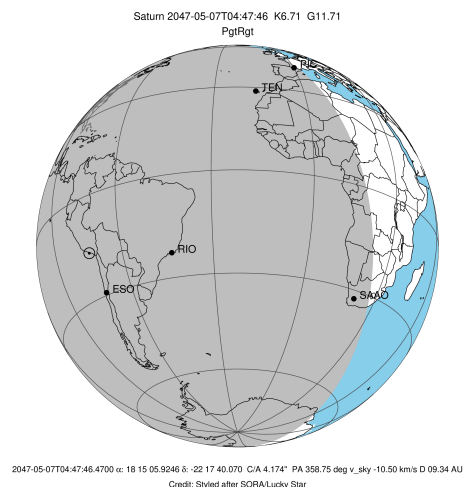
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	OEncode
PIC	Pic du Midi	42.9	0.1	+	+		MAY 07 01:45 - MAY 07 03:19	PinRin
PAL	Palomar Mt (20	33.4	243.1			+	MAY 07 07:08 - MAY 07 08:31	PnnRne
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4		+	+	MAY 07 06:22 - MAY 07 08:30	PneRne
MCD	McDonald Obs.	30.7	256.0		+	+	MAY 07 06:22 - MAY 07 08:29	PneRne
TEN	Teide Obs./Ten	28.3	343.5	+	+		MAY 07 01:50 - MAY 07 03:22	PinRin
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observ	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+	+	+	MAY 07 02:06 - MAY 07 08:17	PieRie
ESO	European South	-29.3	289.3	+	+	+	MAY 07 02:10 - MAY 07 08:20	PieRie
AAT	Siding Spring	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro	-32.4	20.8	+	+		MAY 07 01:57 - MAY 07 03:21	PinRin
MSO	Mt. Stromlo Ob	-35.3	149.0					PnnRnn



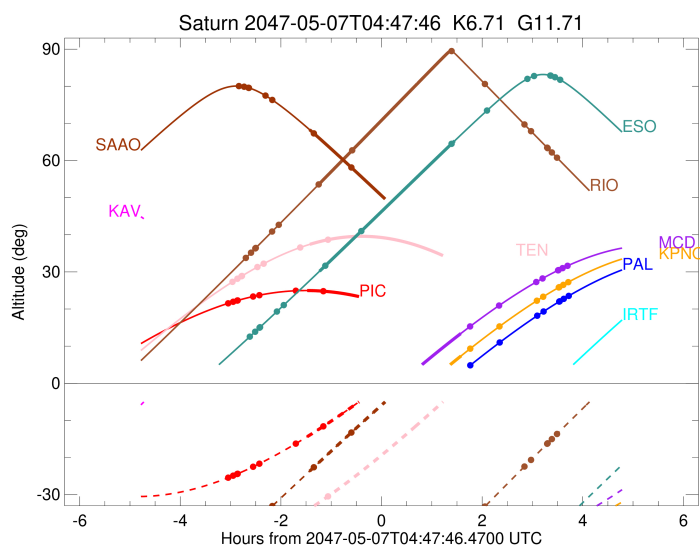
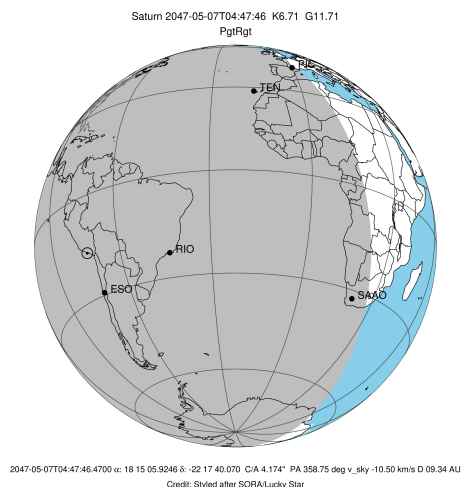
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T04:44:35.450
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 4090688893238936704
 2Mass ID (if available) : 18150591-2217401
 ICRS Star Coord at Epoch: 18h 15m 05.92458s -22:17:40.07039s
 RUWE (>1.4 is poor) : 0.81
 K magnitude : 6.715
 G magnitude : 11.707
 RP magnitude : 10.398
 BP magnitude : 13.693
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.50
 Sun-Target sep (deg) : 132.42
 Sun-Moon sep (deg) : 84.65
 B (ring opening deg) : 26.09
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.347
 C/A sky separation (km) : 22668.9
 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	2047-05-07T01:45:02.853		21.55	-25.43	140461.00	-10.43		
A (OER)	I	2047-05-07T01:50:57.022		21.96	-24.89	136774.40	-10.39		
Encke (OEG)	I	2047-05-07T01:55:49.099		22.28	-24.42	133744.89	-10.35		
Encke (IEG)	I	2047-05-07T01:56:20.161		22.32	-24.37	133423.31	-10.35		
A (IER)	I	2047-05-07T02:14:47.078		23.37	-22.48	122050.38	-10.19		
B (OER)	I	2047-05-07T02:22:08.317		23.72	-21.66	117571.16	-10.11		
B (IER)	I	2047-05-07T03:05:42.330		24.92	-16.25	91984.69	-9.37		
C (IER)	I	2047-05-07T03:38:35.050	b	24.80	-11.58	74490.58	-8.24		
Saturn	I	2047-05-07T03:19:05.794		24.98	-14.40	60005.10		-25.84	-30.64
Saturn	E	2047-05-07T06:10:36.241		13.70	13.96x	60187.61		-13.91	-16.91
C (IER)	E	2047-05-07T06:23:02.382		12.16	16.21x	74490.58	8.18		
B (IER)	E	2047-05-07T06:56:16.662		7.72	22.29x	91984.69	9.25		
B (OER)	E	2047-05-07T07:40:32.473		1.15x	30.42x	117571.16	9.93		
A (IER)	E	2047-05-07T07:48:01.980		-0.02x	31.78x	122050.38	10.00		
Encke (IEG)	E	2047-05-07T08:06:50.985		-3.04x	35.21x	133423.31	10.14		
Encke (OEG)	E	2047-05-07T08:07:22.693		-3.12x	35.30x	133744.89	10.14		
A (OER)	E	2047-05-07T08:12:20.912		-3.93x	36.20x	136774.40	10.17		
F ring	E	2047-05-07T08:18:22.687		-4.93x	37.29x	140461.00	10.21		

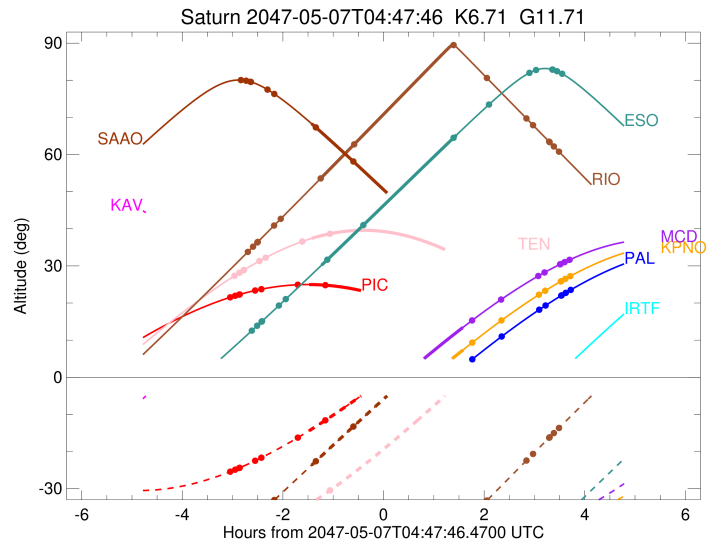
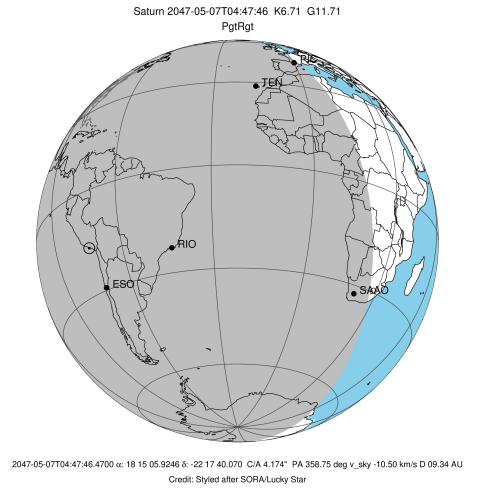
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T04:56:39.300
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 4090688893238936704
 2Mass ID (if available) : 18150591-2217401
 ICRS Star Coord at Epoch: 18h 15m 05.92458s -22:17:40.07039s
 RUWE (>1.4 is poor) : 0.81
 K magnitude : 6.715
 G magnitude : 11.707
 RP magnitude : 10.398
 BP magnitude : 13.693
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.50
 Sun-Target sep (deg) : 132.42
 Sun-Moon sep (deg) : 83.89
 B (ring opening deg) : 26.09
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.688
 C/A sky separation (km) : 24979.3
 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	2047-05-07T01:56:26.091		-51.01x	6.56x	140461.00	-9.68		
A (OER)	I	2047-05-07T02:02:47.513		-49.68x	5.28x	136774.40	-9.65		
Encke (OEG)	I	2047-05-07T02:08:02.096		-48.59x	4.23x	133744.89	-9.61		
Encke (IEG)	I	2047-05-07T02:08:35.553		-48.47x	4.12x	133423.31	-9.61		
A (IER)	I	2047-05-07T02:28:28.312		-44.30x	0.18x	122050.38	-9.45		
B (OER)	I	2047-05-07T02:36:24.175		-42.64x	-1.37x	117571.16	-9.37		
B (IER)	I	2047-05-07T03:23:37.028		-32.76x	-10.35	91984.69	-8.58		
C (IER)	I	2047-05-07T04:00:03.674	b	-25.20x	-16.88	74490.58	-7.27		
Saturn	I	2047-05-07T03:29:23.672		-31.55x	-11.41	59947.29		-28.80	-33.90
Saturn	E	2047-05-07T06:22:53.916		2.88x	-36.39	60174.93		-15.00	-18.20
C (IER)	E	2047-05-07T06:33:40.743		4.84x	-37.27	74490.58	7.51		
B (IER)	E	2047-05-07T07:08:45.361		10.99	-39.30	91984.69	8.96		
B (OER)	E	2047-05-07T07:53:36.776		18.21	-39.94	117571.16	9.94		
A (IER)	E	2047-05-07T08:01:05.012		19.33	-39.83	122050.38	10.05		
Encke (IEG)	E	2047-05-07T08:19:43.909		22.00	-39.26	133423.31	10.27		
Encke (OEG)	E	2047-05-07T08:20:15.203		22.07	-39.24	133744.89	10.28		
A (OER)	E	2047-05-07T08:25:09.198		22.74	-39.03	136774.40	10.33		
F ring	E	2047-05-07T08:31:05.085		23.53	-38.74	140461.00	10.39		

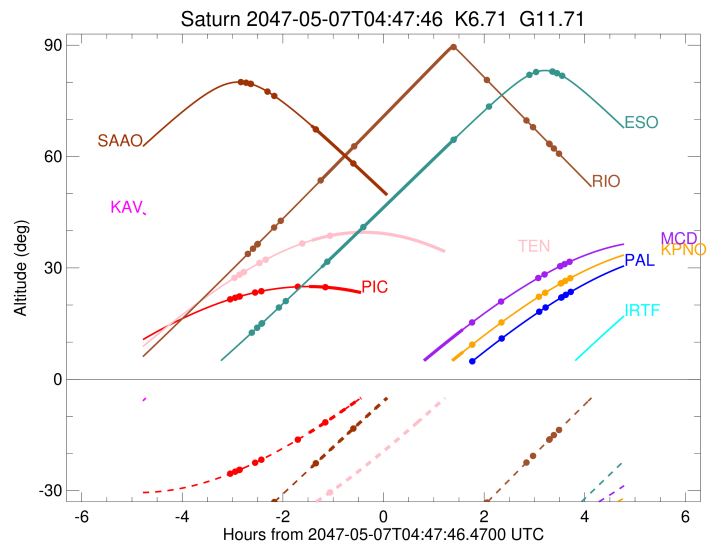
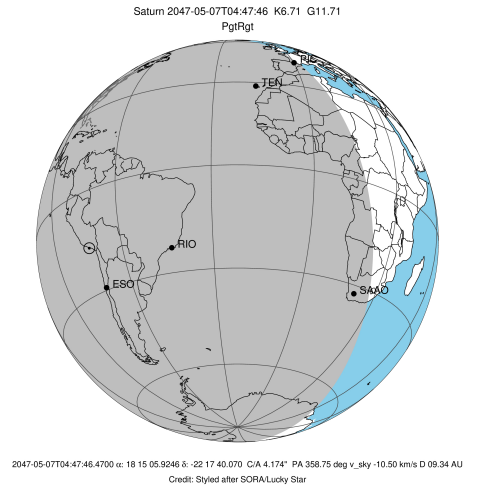
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T04:56:46.780
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 4090688893238936704
 2Mass ID (if available) : 18150591-2217401
 ICRS Star Coord at Epoch: 18h 15m 05.92458s -22:17:40.07039s
 RUWE (>1.4 is poor) : 0.81
 K magnitude : 6.715
 G magnitude : 11.707
 RP magnitude : 10.398
 BP magnitude : 13.693
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.50
 Sun-Target sep (deg) : 132.42
 Sun-Moon sep (deg) : 83.97
 B (ring opening deg) : 26.09
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.678
 C/A sky separation (km) : 24908.8
 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	2047-05-07T01:57:05.165		-46.50x	1.78x	140461.00	-9.72		
A (OER)	I	2047-05-07T02:03:25.135		-45.16x	0.51x	136774.40	-9.68		
Encke (OEG)	I	2047-05-07T02:08:38.493		-44.04x	-0.54x	133744.89	-9.65		
Encke (IEG)	I	2047-05-07T02:09:11.819		-43.92x	-0.65x	133423.31	-9.65		
A (IER)	I	2047-05-07T02:28:59.687		-39.71x	-4.56x	122050.38	-9.49		
B (OER)	I	2047-05-07T02:36:53.493		-38.03x	-6.10	117571.16	-9.41		
B (IER)	I	2047-05-07T03:23:52.590		-28.11x	-14.94	91984.69	-8.63		
C (IER)	I	2047-05-07T04:00:05.677	b	-20.56x	-21.30	74490.58	-7.32		
Saturn	I	2047-05-07T03:29:45.974		-26.87x	-16.01	59948.27		-28.75	-33.84
Saturn	E	2047-05-07T06:22:46.251		7.39	-39.31	60175.62		-14.94	-18.13
C (IER)	E	2047-05-07T06:33:37.832		9.33	-39.98	74490.58	7.57		
B (IER)	E	2047-05-07T07:08:30.732		15.31	-41.27	91984.69	9.01		
B (OER)	E	2047-05-07T07:53:11.407		22.25	-40.84	117571.16	9.97		
A (IER)	E	2047-05-07T08:00:38.147		23.31	-40.55	122050.38	10.08		
Encke (IEG)	E	2047-05-07T08:19:13.610		25.82	-39.54	133423.31	10.30		
Encke (OEG)	E	2047-05-07T08:19:44.813		25.89	-39.50	133744.89	10.31		
A (OER)	E	2047-05-07T08:24:37.976		26.51	-39.17	136774.40	10.36		
F ring	E	2047-05-07T08:30:32.892		27.24	-38.74	140461.00	10.42		

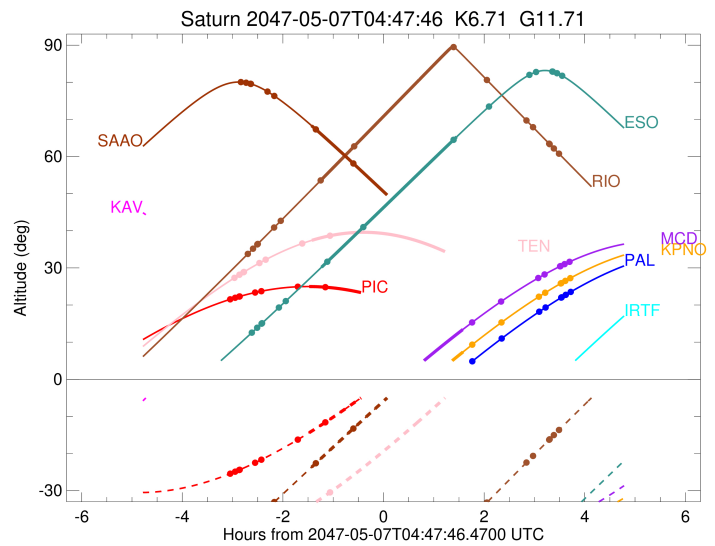
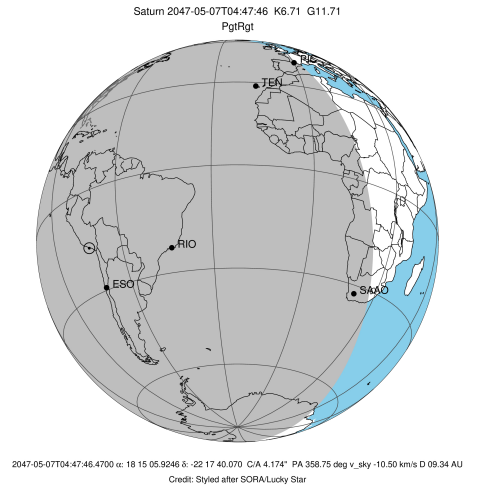
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T04:56:44.390
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 4090688893238936704
 2Mass ID (if available) : 18150591-2217401
 ICRS Star Coord at Epoch: 18h 15m 05.92458s -22:17:40.07039s
 RUWE (>1.4 is poor) : 0.81
 K magnitude : 6.715
 G magnitude : 11.707
 RP magnitude : 10.398
 BP magnitude : 13.693
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.50
 Sun-Target sep (deg) : 132.42
 Sun-Moon sep (deg) : 84.08
 B (ring opening deg) : 26.09
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.654
 C/A sky separation (km) : 24748.0
 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	2047-05-07T01:57:39.646		-39.85x	-4.86x	140461.00	-9.78		
A (OER)	I	2047-05-07T02:03:57.179		-38.50x	-6.11	136774.40	-9.75		
Encke (OEG)	I	2047-05-07T02:09:08.488		-37.38x	-7.13	133744.89	-9.72		
Encke (IEG)	I	2047-05-07T02:09:41.594		-37.26x	-7.23	133423.31	-9.71		
A (IER)	I	2047-05-07T02:29:21.340		-33.05x	-11.05	122050.38	-9.56		
B (OER)	I	2047-05-07T02:37:11.746		-31.37x	-12.54	117571.16	-9.48		
B (IER)	I	2047-05-07T03:23:48.062		-21.51x	-21.05	91984.69	-8.71		
C (IER)	I	2047-05-07T03:59:37.914	b	-14.07x	-27.02	74490.58	-7.42		
Saturn	I	2047-05-07T03:30:03.081		-20.20x	-22.13	59951.11		-28.61	-33.69
Saturn	E	2047-05-07T06:22:25.467		13.41	-42.13	60177.07		-14.82	-17.98
C (IER)	E	2047-05-07T06:33:28.533		15.31	-42.46	74490.58	7.66		
B (IER)	E	2047-05-07T07:08:02.350		20.94	-42.53	91984.69	9.07		
B (OER)	E	2047-05-07T07:52:27.242		27.29	-40.53	117571.16	10.02		
A (IER)	E	2047-05-07T07:59:51.917		28.24	-39.98	122050.38	10.12		
Encke (IEG)	E	2047-05-07T08:18:22.770		30.43	-38.36	133423.31	10.34		
Encke (OEG)	E	2047-05-07T08:18:53.855		30.49	-38.31	133744.89	10.35		
A (OER)	E	2047-05-07T08:23:45.932		31.02	-37.83	136774.40	10.40		
F ring	E	2047-05-07T08:29:39.596		31.64	-37.22	140461.00	10.45		

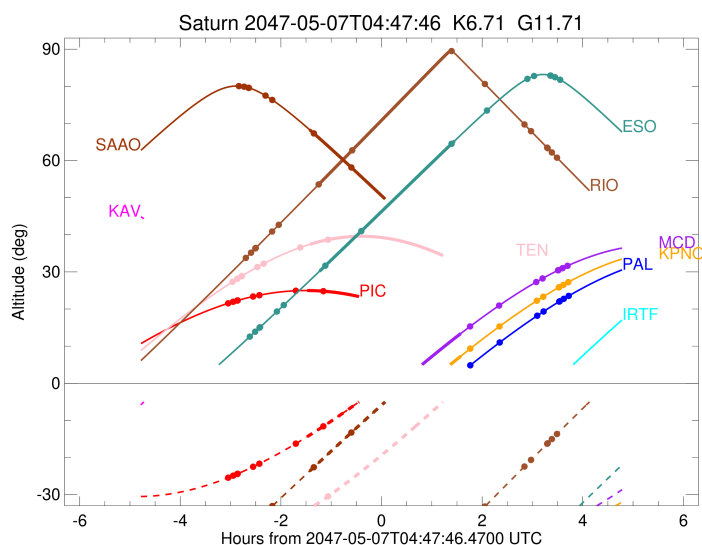
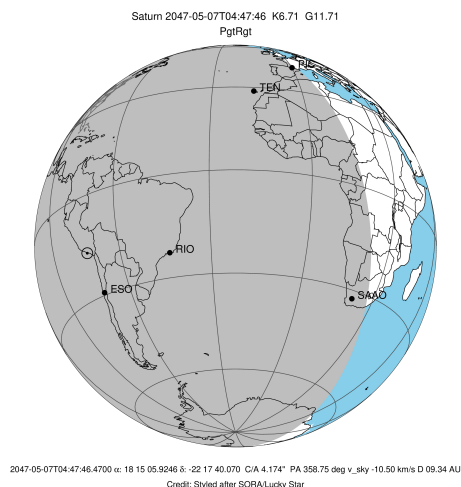
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T04:46:35.880
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 4090688893238936704
 2Mass ID (if available) : 18150591-2217401
 ICRS Star Coord at Epoch: 18h 15m 05.92458s -22:17:40.07039s
 RUWE (>1.4 is poor) : 0.81
 K magnitude : 6.715
 G magnitude : 11.707
 RP magnitude : 10.398
 BP magnitude : 13.693
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.50
 Sun-Target sep (deg) : 132.42
 Sun-Moon sep (deg) : 84.89
 B (ring opening deg) : 26.09
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.453
 C/A sky separation (km) : 23382.5
 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

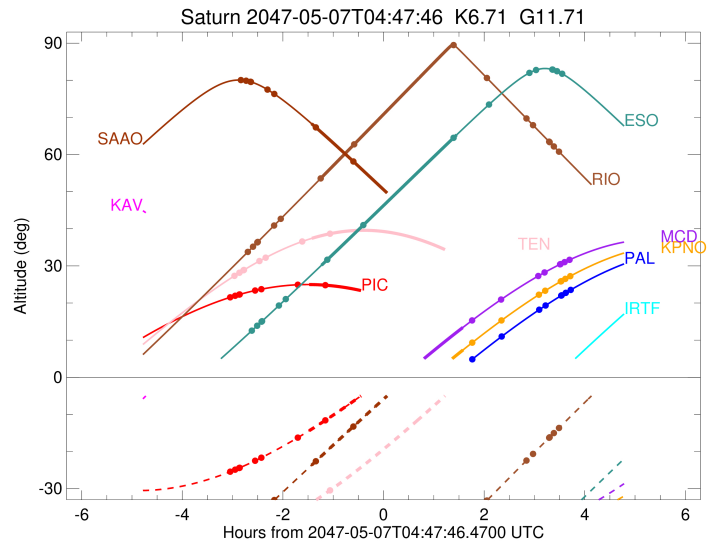
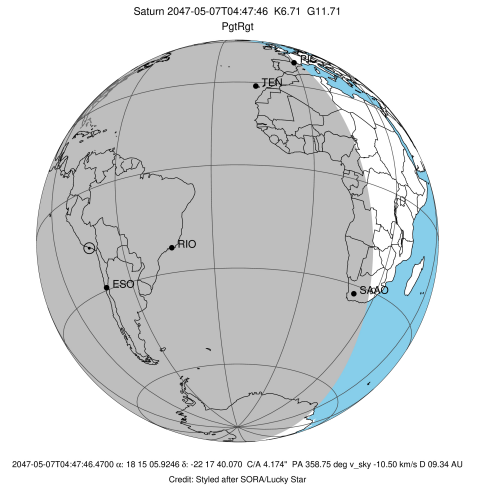
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-07T01:50:07.978		27.33	-43.65	140461.00	-10.42		
A (OER)	I	2047-05-07T01:56:02.437		28.17	-43.28	136774.40	-10.38		
Encke (OEG)	I	2047-05-07T02:00:54.755		28.85	-42.94	133744.89	-10.35		
Encke (IEG)	I	2047-05-07T02:01:25.843		28.92	-42.90	133423.31	-10.34		
A (IER)	I	2047-05-07T02:19:53.814		31.32	-41.36	122050.38	-10.18		
B (OER)	I	2047-05-07T02:27:15.608		32.22	-40.64	117571.16	-10.10		
B (IER)	I	2047-05-07T03:10:57.590		36.58	-35.39	91984.69	-9.32		
C (IER)	I	2047-05-07T03:44:11.287	b	38.68	-30.44	74490.58	-8.10		
Saturn	I	2047-05-07T03:22:11.452		37.42	-33.80	59989.60		-26.65	-31.54
Saturn	E	2047-05-07T06:11:17.113		33.31	-2.91x	60181.33		-14.46	-17.56
C (IER)	E	2047-05-07T06:22:34.981		32.00	-0.57x	74490.58	8.07		
B (IER)	E	2047-05-07T06:55:59.517		27.61	6.46x	91984.69	9.25		
B (OER)	E	2047-05-07T07:40:04.616		20.80	15.92x	117571.16	9.99		
A (IER)	E	2047-05-07T07:47:31.029		19.55	17.53x	122050.38	10.07		
Encke (IEG)	E	2047-05-07T08:06:11.346		16.33	21.60x	133423.31	10.22		
Encke (OEG)	E	2047-05-07T08:06:42.795		16.24	21.71x	133744.89	10.23		
A (OER)	E	2047-05-07T08:11:38.543		15.36	22.79x	136774.40	10.26		
F ring	E	2047-05-07T08:17:37.248		14.29	24.10x	140461.00	10.29		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T04:51:08.770
 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 : 4090688893238936704
 2Mass ID (if available) : 18150591-2217401
 ICRS Star Coord at Epoch: 18h 15m 05.92458s -22:17:40.07039s
 RUWE (>1.4 is poor) : 0.81
 K magnitude : 6.715
 G magnitude : 11.707
 RP magnitude : 10.398
 BP magnitude : 13.693
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.50
 Sun-Target sep (deg) : 132.42
 Sun-Moon sep (deg) : 85.16
 B (ring opening deg) : 26.09
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.194
 C/A sky separation (km) : 28402.2
 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



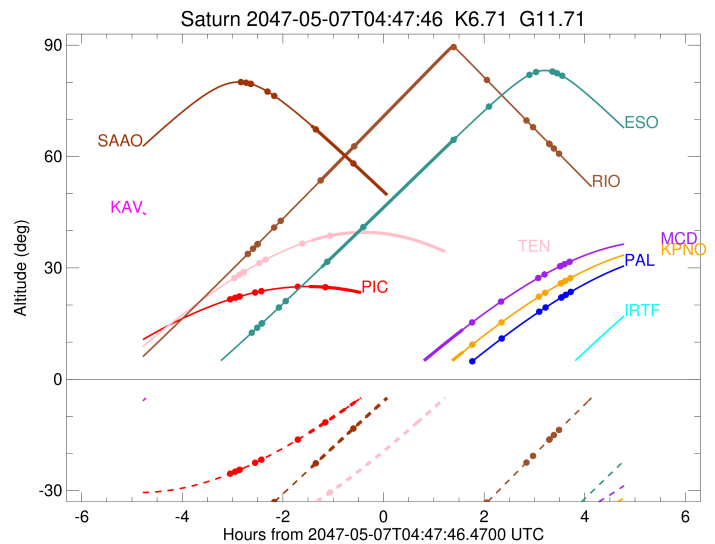
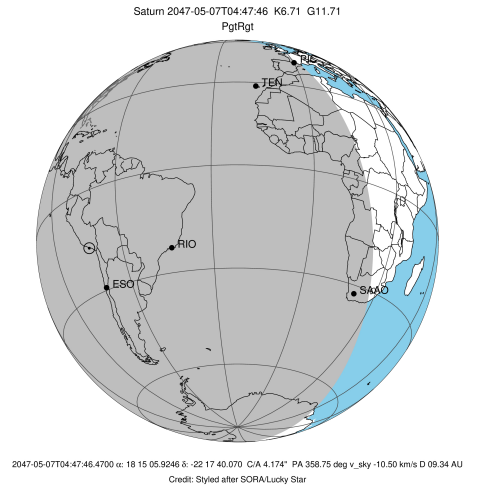
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-07T02:06:04.696		33.80	-78.18	140461.00	-9.95		
A (OER)	I	2047-05-07T02:12:16.082		35.20	-79.41	136774.40	-9.90		
Encke (OEG)	I	2047-05-07T02:17:22.978		36.35	-80.38	133744.89	-9.84		
Encke (IEG)	I	2047-05-07T02:17:55.651		36.48	-80.48	133423.31	-9.84		
A (IER)	I	2047-05-07T02:37:25.433		40.90	-83.38	122050.38	-9.59		
B (OER)	I	2047-05-07T02:45:15.362		42.68	-83.93	117571.16	-9.47		
B (IER)	I	2047-05-07T03:32:59.401	b	53.60	-78.14	91984.69	-8.23		
C (IER)	I	2047-05-07T04:13:04.871	b	62.82	-69.45	74490.58	-6.08		
Saturn	I	2047-05-07T03:30:21.442		52.99	-78.67	59888.97		-31.61	-36.92
Saturn	E	2047-05-07T06:11:48.942		89.45	-42.23	60122.87		-18.87	-22.73
C (IER)	E	2047-05-07T06:11:24.573	b	89.49	-42.33	74490.58	6.14		
B (IER)	E	2047-05-07T06:51:08.205		80.61	-33.20	91984.69	8.31		
B (OER)	E	2047-05-07T07:38:24.188		69.69	-22.40	117571.16	9.57		
A (IER)	E	2047-05-07T07:46:08.788		67.90	-20.64	122050.38	9.70		
Encke (IEG)	E	2047-05-07T08:05:24.277		63.46	-16.29	133423.31	9.97		
Encke (OEG)	E	2047-05-07T08:05:56.529		63.33	-16.16	133744.89	9.97		
A (OER)	E	2047-05-07T08:10:59.415		62.17	-15.03	136774.40	10.03		
F ring	E	2047-05-07T08:17:05.808		60.76	-13.65	140461.00	10.09		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T04:54:42.260
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 4090688893238936704
 2Mass ID (if available) : 18150591-2217401
 ICRS Star Coord at Epoch: 18h 15m 05.92458s -22:17:40.07039s
 RUWE (>1.4 is poor) : 0.81
 K magnitude : 6.715
 G magnitude : 11.707
 RP magnitude : 10.398
 BP magnitude : 13.693
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.50
 Sun-Target sep (deg) : 132.42
 Sun-Moon sep (deg) : 84.91
 B (ring opening deg) : 26.09
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.368
 C/A sky separation (km) : 29577.9
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-07T02:10:50.309		12.58	-53.82	140461.00	-9.67		
A (OER)	I	2047-05-07T02:17:12.625		13.90	-55.18	136774.40	-9.61		
Encke (OEG)	I	2047-05-07T02:22:28.681		15.00	-56.30	133744.89	-9.56		
Encke (IEG)	I	2047-05-07T02:23:02.337		15.12	-56.42	133423.31	-9.55		
A (IER)	I	2047-05-07T02:43:08.485		19.35	-60.64	122050.38	-9.29		
B (OER)	I	2047-05-07T02:51:13.838		21.06	-62.30	117571.16	-9.16		
B (IER)	I	2047-05-07T03:40:52.751	b	31.69	-71.77	91984.69	-7.84		
C (IER)	I	2047-05-07T04:24:03.316	b	41.07	-77.20	74490.58	-5.40		
Saturn	I	2047-05-07T03:33:51.652		30.18	-70.56	59859.93		-32.96	-38.35
Saturn	E	2047-05-07T06:15:03.795		65.31	-64.87	60110.41		-19.69	-23.68
C (IER)	E	2047-05-07T06:11:21.808	b	64.51	-65.60	74490.58	5.51		
B (IER)	E	2047-05-07T06:53:38.840		73.48	-56.90	91984.69	8.02		
B (OER)	E	2047-05-07T07:41:56.346		82.01	-46.53	117571.16	9.46		
A (IER)	E	2047-05-07T07:49:45.921		82.77	-44.83	122050.38	9.61		
Encke (IEG)	E	2047-05-07T08:09:09.777		82.89	-40.60	133423.31	9.92		
Encke (OEG)	E	2047-05-07T08:09:42.191		82.86	-40.48	133744.89	9.92		
A (OER)	E	2047-05-07T08:14:46.415		82.44	-39.37	136774.40	9.99		
F ring	E	2047-05-07T08:20:54.028		81.75	-38.04	140461.00	10.07		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T04:41:40.510
 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 : 4090688893238936704
 2Mass ID (if available) : 18150591-2217401
 ICRS Star Coord at Epoch: 18h 15m 05.92458s -22:17:40.07039s
 RUWE (>1.4 is poor) : 0.81
 K magnitude : 6.715
 G magnitude : 11.707
 RP magnitude : 10.398
 BP magnitude : 13.693
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.50
 Sun-Target sep (deg) : 132.42
 Sun-Moon sep (deg) : 85.06
 B (ring opening deg) : 26.09
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.427
 C/A sky separation (km) : 29983.3
 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	2047-05-07T01:57:49.603		80.05	-41.46	140461.00	-9.90		
A (OER)	I	2047-05-07T02:04:03.417		79.88	-40.15	136774.40	-9.82		
Encke (OEG)	I	2047-05-07T02:09:12.974		79.59	-39.06	133744.89	-9.75		
Encke (IEG)	I	2047-05-07T02:09:45.968		79.56	-38.94	133423.31	-9.74		
A (IER)	I	2047-05-07T02:29:32.250		77.48	-34.77	122050.38	-9.42		
B (OER)	I	2047-05-07T02:37:31.902		76.32	-33.08	117571.16	-9.26		
B (IER)	I	2047-05-07T03:27:13.575	b	67.28	-22.59	91984.69	-7.72		
C (IER)	I	2047-05-07T04:12:12.453	b	58.05	-13.20	74490.58	-4.97		
Saturn	I	2047-05-07T03:21:56.206		68.33	-23.70	59872.36		-32.38	-37.75
Saturn	E	2047-05-07T06:02:20.791		34.76	8.79x	60088.88		-21.06	-25.26
C (IER)	E	2047-05-07T05:52:31.798	b	36.83	6.92x	74490.58	4.94		
B (IER)	E	2047-05-07T06:38:07.898		27.25	15.40x	91984.69	7.56		
B (OER)	E	2047-05-07T07:29:13.034		16.71	24.09x	117571.16	8.95		
A (IER)	E	2047-05-07T07:37:29.385		15.02	25.40x	122050.38	9.09		
Encke (IEG)	E	2047-05-07T07:58:00.419		10.89	28.47x	133423.31	9.37		
Encke (OEG)	E	2047-05-07T07:58:34.725		10.78	28.55x	133744.89	9.38		
A (OER)	E	2047-05-07T08:03:56.763		9.71	29.32x	136774.40	9.44		
F ring	E	2047-05-07T08:10:26.052		8.42	30.22x	140461.00	9.50		