

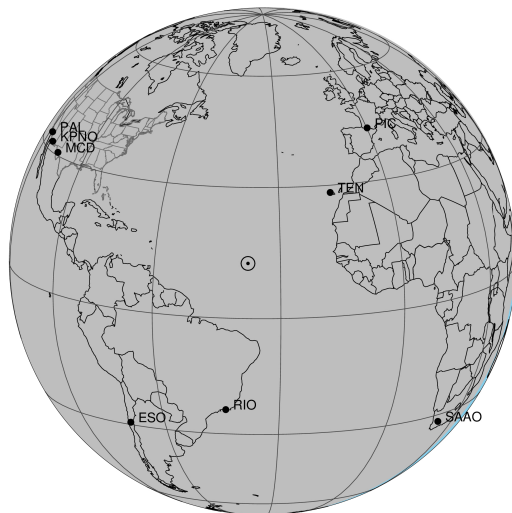
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2037-02-15T02:44:09.310
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3881962210025024896
 2Mass ID (if available) : 10072943+1316064

Saturn 2037-02-15T02:44:09 K7.65 G10.00 PgtRgt

ICRS Star Coord at Epoch: 10h 07m 29.39957s +13:16:06.38730s

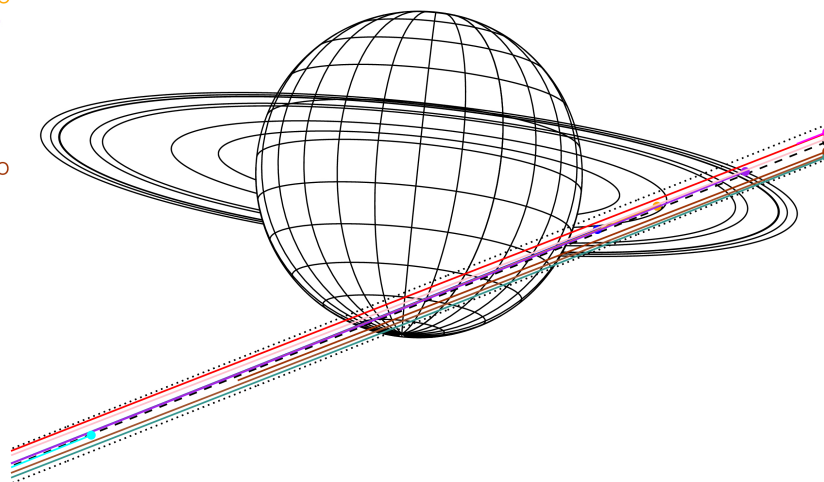
RUWE (>1.4 is poor) : 0.94
 K magnitude : 7.654
 G magnitude : 10.003
 RP magnitude : 9.294
 BP magnitude : 10.565
 DUPflag : 0
 Distance (au) : 8.248
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.15
 Sun-Target sep (deg) : 176.66
 Sun-Moon sep (deg) : 176.10
 B (ring opening deg) : -10.84
 PA of pole (deg) : -6.17

Saturn 2037-02-15T02:44:09 K7.65 G10.00
 PgtRgt



2037-02-15T02:44:09.3100 α: 10 07 29.3996 δ: +13 16 06.387 C/A 7.430° PA 21.68 deg v_sky -20.15 km/s D 08.25 AU
 Credit: Styled after SORA/Lucky Star

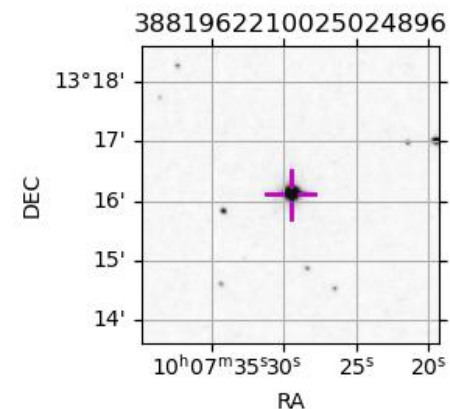
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 SAAO



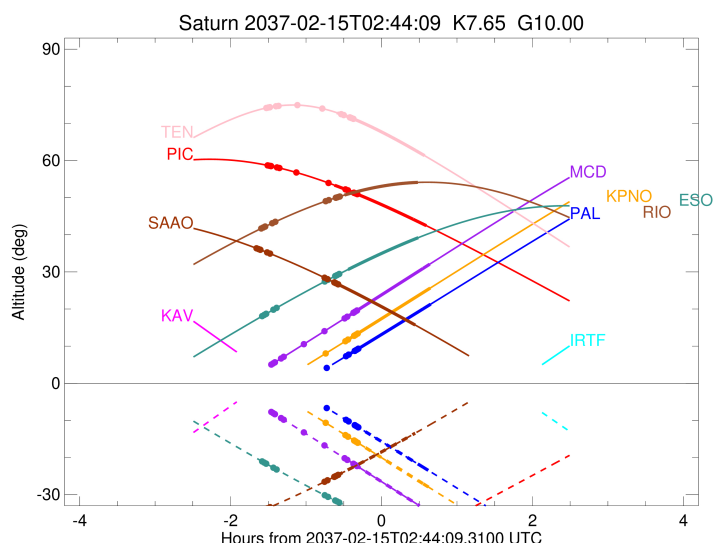
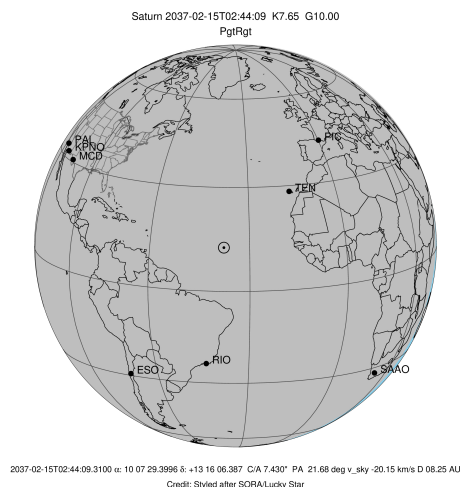
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	+ + + + +	+ +	+	FEB 15 01:13 - FEB 15 03:19	PieRie
PAL	Palomar Mt (20	33.4	243.1		+ +		FEB 15 02:14 - FEB 15 03:23	PieRnn
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4		+ +	+	FEB 15 01:59 - FEB 15 03:22	PieRne
MCD	McDonald Obs.	30.7	256.0	+ + + + +	+ +	+ +	FEB 15 01:16 - FEB 15 03:22	PieRie
TEN	Teide Obs./Ten	28.3	343.5	+ + + + +	+ +	+	FEB 15 01:12 - FEB 15 03:18	PieRie
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	+ + + + +	+ +	+ + + + +	FEB 15 01:08 - FEB 15 03:13	PieRie
ESO	European South	-29.3	289.3	+ + + + +	+ +	+ + + + +	FEB 15 01:09 - FEB 15 03:13	PieRie
AAT	Siding Spring	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro	-32.4	20.8	+ + + + +	+ +	+ + + + +	FEB 15 01:04 - FEB 15 03:10	PieRie
MSO	Mt. Stromlo Ob	-35.3	149.0					PnnRnn

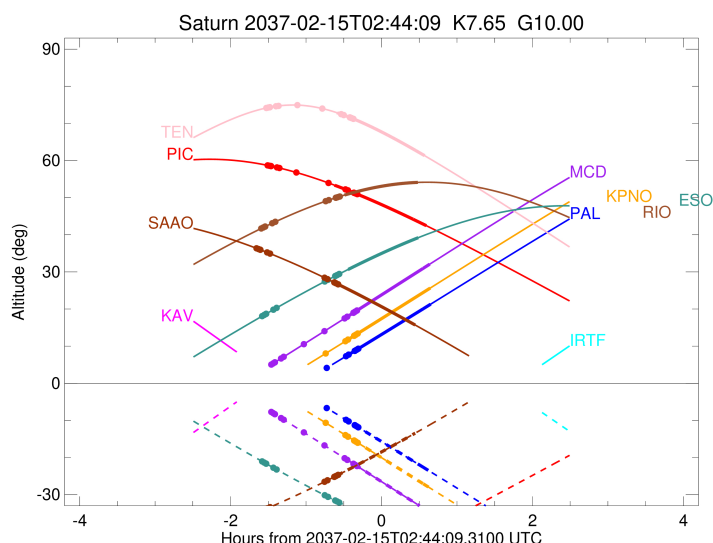
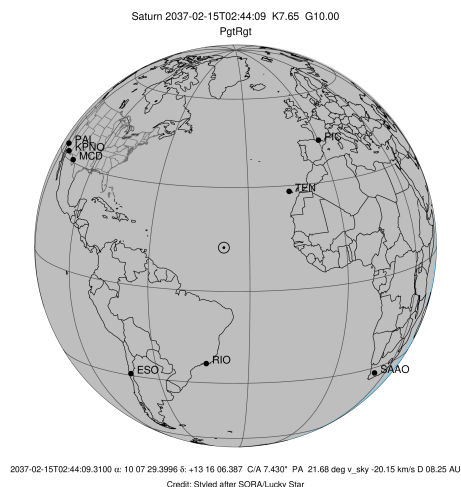


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2037-02-15T02:43:24.100
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3881962210025024896
 2Mass ID (if available) : 10072943+1316064
 ICRS Star Coord at Epoch: 10h 07m 29.39957s +13:16:06.38730s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 7.654
 G magnitude : 10.003
 RP magnitude : 9.294
 BP magnitude : 10.565
 DUPflag : 0
 Distance (au) : 8.248
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.15
 Sun-Target sep (deg) : 176.66
 Sun-Moon sep (deg) : 176.28
 B (ring opening deg) : -10.84
 PA of pole (deg) : -6.17
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.749
 C/A sky separation (km) : 40371.5
 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



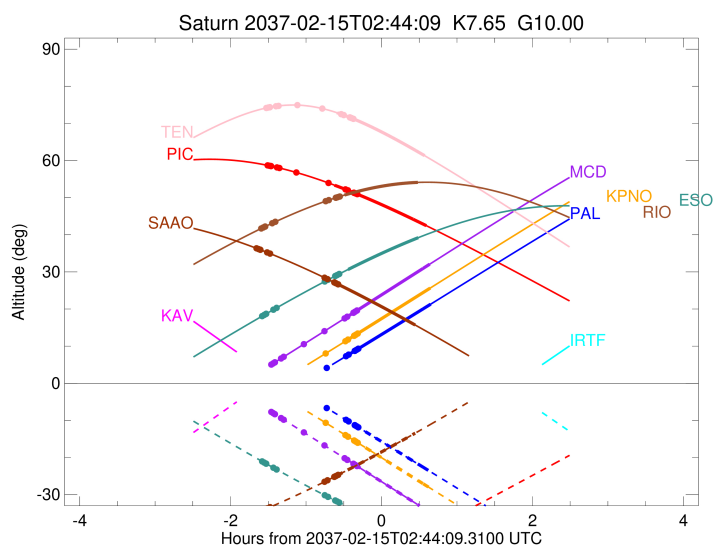
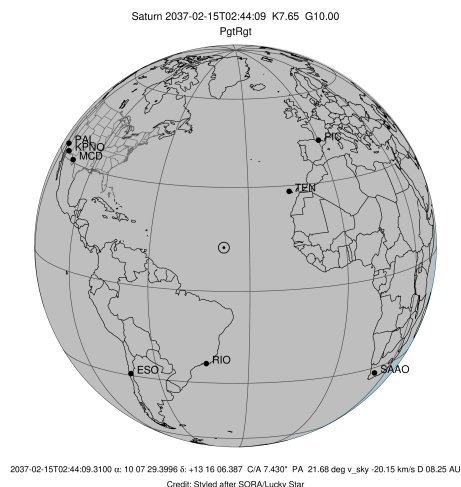
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2037-02-15T01:13:44.364		58.69	-57.17	140461.00	-43.22		
A (OER)	I	2037-02-15T01:15:10.282		58.59	-57.04	136774.40	-42.59		
Encke (OEG)	I	2037-02-15T01:16:21.878		58.50	-56.94	133744.89	-42.03		
Encke (IEG)	I	2037-02-15T01:16:29.534		58.49	-56.92	133423.31	-41.97		
A (IER)	I	2037-02-15T01:21:08.816		58.14	-56.50	122050.38	-39.36		
B (OER)	I	2037-02-15T01:23:04.497		57.98	-56.31	117571.17	-38.06		
B (IER)	I	2037-02-15T01:36:30.133		56.78	-54.92	91984.69	-23.71		
Saturn	I	2037-02-15T02:06:53.003		53.35	-51.15	60255.17		-14.39	-17.48
Saturn	E	2037-02-15T03:19:47.704		42.45	-39.83	60092.71		-67.02	-70.67
B (IER)	E	2037-02-15T02:02:04.670		53.95	-51.79	91984.69	23.71		
B (OER)	E	2037-02-15T02:15:30.639	b	52.23	-49.95	117571.16	38.04		
A (IER)	E	2037-02-15T02:17:26.375	b	51.97	-49.68	122050.38	39.34		
Encke (IEG)	E	2037-02-15T02:22:05.803	b	51.34	-49.01	133423.31	41.95		
Encke (OEG)	E	2037-02-15T02:22:13.464	b	51.32	-48.99	133744.89	42.01		
A (OER)	E	2037-02-15T02:23:25.102	b	51.15	-48.81	136774.40	42.57		
F ring	E	2037-02-15T02:24:51.073	b	50.95	-48.60	140461.00	43.19		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2037-02-15T02:49:05.320
 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 : 3881962210025024896
 2Mass ID (if available) : 10072943+1316064
 ICRS Star Coord at Epoch: 10h 07m 29.39957s +13:16:06.38730s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 7.654
 G magnitude : 10.003
 RP magnitude : 9.294
 BP magnitude : 10.565
 DUPflag : 0
 Distance (au) : 8.248
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.15
 Sun-Target sep (deg) : 176.66
 Sun-Moon sep (deg) : 175.25
 B (ring opening deg) : -10.84
 PA of pole (deg) : -6.17
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.256
 C/A sky separation (km) : 43408.8
 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



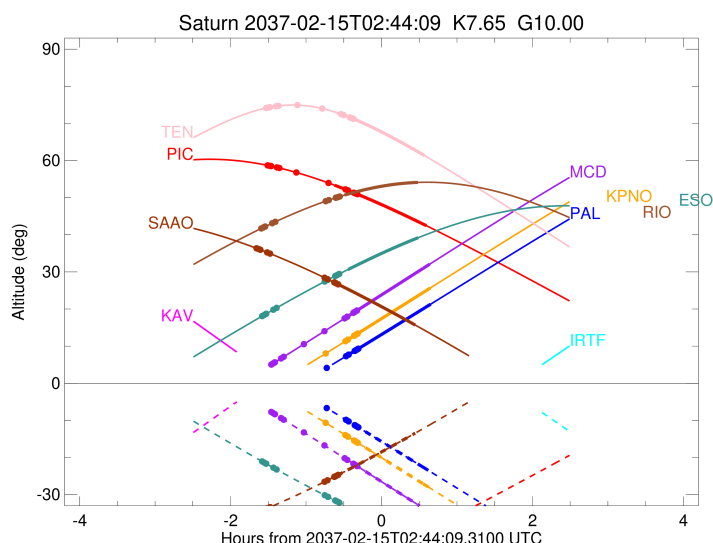
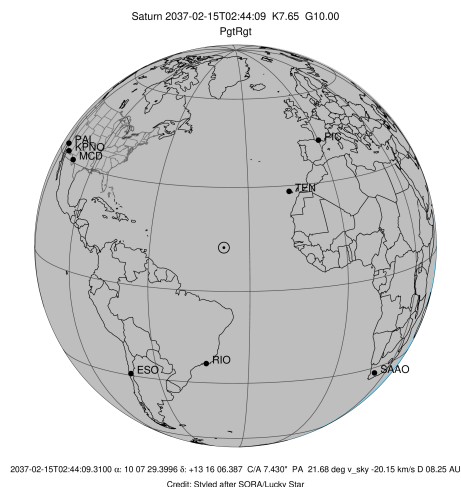
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2037-02-15T01:17:03.550	-4.65x	2.17x	140461.00	-41.98			
A (OER)	I	2037-02-15T01:18:32.120	-4.36x	1.87x	136774.40	-41.26			
Encke (OEG)	I	2037-02-15T01:19:46.118	-4.11x	1.62x	133744.89	-40.61			
Encke (IEG)	I	2037-02-15T01:19:54.043	-4.09x	1.60x	133423.31	-40.54			
A (IER)	I	2037-02-15T01:24:44.962	-3.12x	0.62x	122050.38	-37.51			
B (OER)	I	2037-02-15T01:26:46.826	-2.71x	0.21x	117571.16	-35.97			
B (IER)	I	2037-02-15T01:42:07.053	0.37x	-2.90x	91984.69	-17.35			
Saturn	I	2037-02-15T02:14:36.988	7.01	-9.57	60248.72	-17.75		-21.43	
Saturn	E	2037-02-15T03:23:16.452	21.31	-23.87	60083.33	-70.92		-74.02	
B (IER)	E	2037-02-15T02:00:40.696	4.15x	-6.69	91984.69	17.37			
B (OER)	E	2037-02-15T02:15:59.341	b	7.29	117571.16	36.07			
A (IER)	E	2037-02-15T02:18:00.880	b	7.71	122050.38	37.61			
Encke (IEG)	E	2037-02-15T02:22:50.911	b	8.71	133423.31	40.68			
Encke (OEG)	E	2037-02-15T02:22:58.810	b	8.74	133744.88	40.75			
A (OER)	E	2037-02-15T02:24:12.556	b	8.99	136774.40	41.40			
F ring	E	2037-02-15T02:25:40.813	b	9.29	140461.00	42.13			

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2037-02-15T02:49:01.750
 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 : 3881962210025024896
 2Mass ID (if available) : 10072943+1316064
 ICRS Star Coord at Epoch: 10h 07m 29.39957s +13:16:06.38730s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 7.654
 G magnitude : 10.003
 RP magnitude : 9.294
 BP magnitude : 10.565
 DUPflag : 0
 Distance (au) : 8.248
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.15
 Sun-Target sep (deg) : 176.66
 Sun-Moon sep (deg) : 175.27
 B (ring opening deg) : -10.84
 PA of pole (deg) : -6.17
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.293
 C/A sky separation (km) : 43626.4
 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



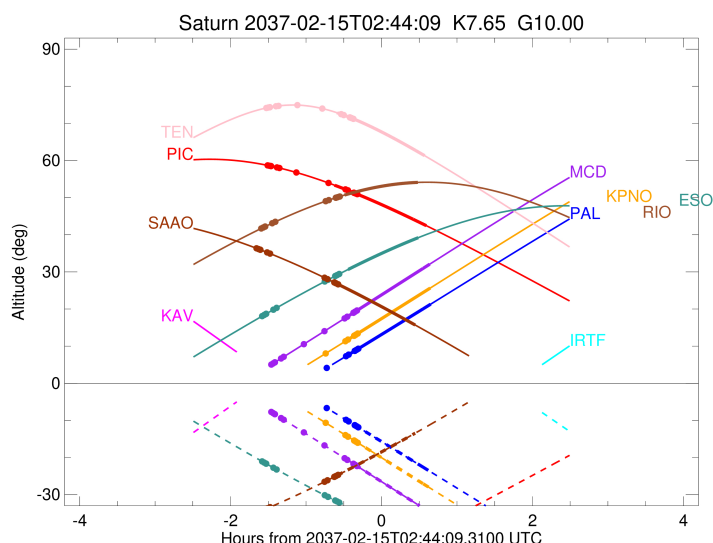
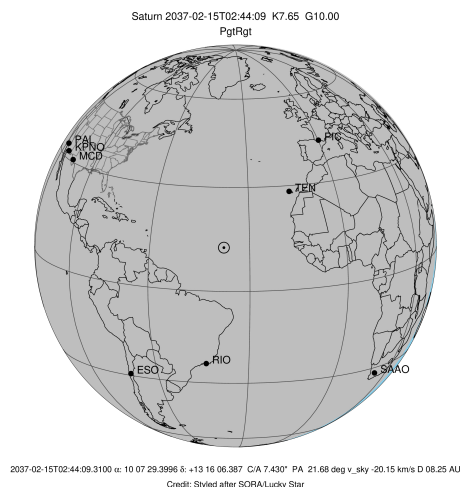
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2037-02-15T01:16:53.449	-0.87x	-1.72x	140461.00	-41.85			
A (OER)	I	2037-02-15T01:18:22.299	-0.56x	-2.03x	136774.40	-41.12			
Encke (OEG)	I	2037-02-15T01:19:36.556	-0.31x	-2.28x	133744.89	-40.46			
Encke (IEG)	I	2037-02-15T01:19:44.510	-0.28x	-2.31x	133423.31	-40.39			
A (IER)	I	2037-02-15T01:24:36.750	0.72x	-3.32x	122050.38	-37.30			
B (OER)	I	2037-02-15T01:26:39.351	1.14x	-3.74x	117571.17	-35.74			
B (IER)	I	2037-02-15T01:42:17.453	4.38x	-6.99	91984.69	-16.45			
Saturn	I	2037-02-15T02:14:48.113		11.19	-13.82	60248.01		-18.08	-21.81
Saturn	E	2037-02-15T03:22:58.295		25.66	-28.28	60082.86		-71.13	-74.20
B (IER)	E	2037-02-15T01:59:51.514		8.05	-10.67	91984.69	16.46		
B (OER)	E	2037-02-15T02:15:28.128	b	11.33	-13.96	117571.16	35.82		
A (IER)	E	2037-02-15T02:17:30.423	b	11.76	-14.39	122050.38	37.40		
Encke (IEG)	E	2037-02-15T02:22:21.825	b	12.78	-15.42	133423.31	40.52		
Encke (OEG)	E	2037-02-15T02:22:29.754	b	12.81	-15.45	133744.89	40.59		
A (OER)	E	2037-02-15T02:23:43.774	b	13.07	-15.71	136774.40	41.26		
F ring	E	2037-02-15T02:25:12.328	b	13.38	-16.02	140461.00	42.00		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2037-02-15T02:48:52.190
 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 : 3881962210025024896
 2Mass ID (if available) : 10072943+1316064
 ICRS Star Coord at Epoch: 10h 07m 29.39957s +13:16:06.38730s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 7.654
 G magnitude : 10.003
 RP magnitude : 9.294
 BP magnitude : 10.565
 DUPflag : 0
 Distance (au) : 8.248
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.15
 Sun-Target sep (deg) : 176.66
 Sun-Moon sep (deg) : 175.31
 B (ring opening deg) : -10.84
 PA of pole (deg) : -6.17
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.327
 C/A sky separation (km) : 43831.6
 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	2037-02-15T01:16:39.245		5.06	-7.75	140461.00	-41.73		
A (OER)	I	2037-02-15T01:18:08.381		5.38	-8.07	136774.40	-40.98		
Encke (OEG)	I	2037-02-15T01:19:22.906		5.64	-8.33	133744.89	-40.31		
Encke (IEG)	I	2037-02-15T01:19:30.890		5.67	-8.36	133423.31	-40.24		
A (IER)	I	2037-02-15T01:24:24.512		6.70	-9.40	122050.38	-37.09		
B (OER)	I	2037-02-15T01:26:27.895		7.14	-9.83	117571.16	-35.49		
B (IER)	I	2037-02-15T01:42:26.664		10.54	-13.24	91984.69	-15.43		
Saturn	I	2037-02-15T02:14:54.081		17.49	-20.20	60247.27		-18.41	-22.20
Saturn	E	2037-02-15T03:22:33.480		32.10	-34.75	60082.46		-71.31	-74.36
B (IER)	E	2037-02-15T01:58:53.539		14.06	-16.76	91984.69	15.44		
B (OER)	E	2037-02-15T02:14:50.972		17.48	-20.19	117571.16	35.57		
A (IER)	E	2037-02-15T02:16:54.079	b	17.93	-20.63	122050.38	37.17		
Encke (IEG)	E	2037-02-15T02:21:46.945	b	18.98	-21.68	133423.31	40.35		
Encke (OEG)	E	2037-02-15T02:21:54.907	b	19.00	-21.71	133744.89	40.43		
A (OER)	E	2037-02-15T02:23:09.217	b	19.27	-21.97	136774.40	41.10		
F ring	E	2037-02-15T02:24:38.086	b	19.59	-22.29	140461.00	41.85		

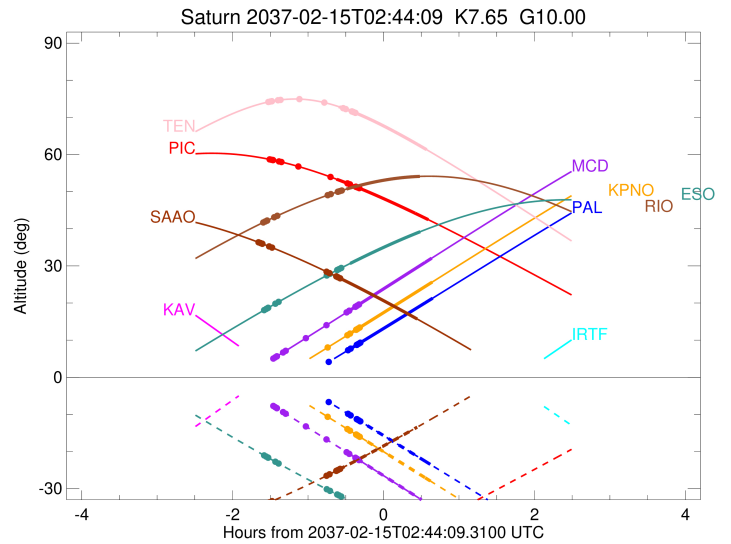
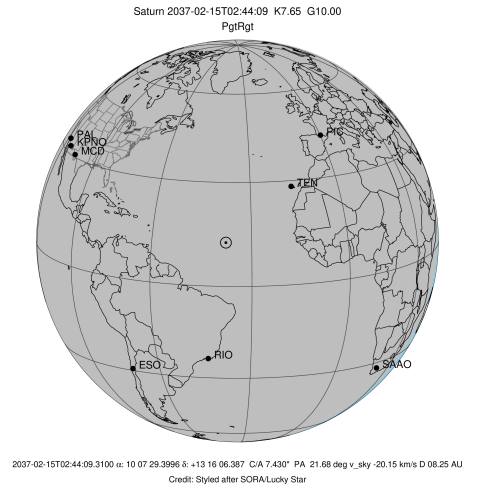
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2037-02-15T02:43:40.340
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 3881962210025024896
 2Mass ID (if available) : 10072943+1316064
 ICRS Star Coord at Epoch: 10h 07m 29.39957s +13:16:06.38730s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 7.654
 G magnitude : 10.003
 RP magnitude : 9.294
 BP magnitude : 10.565
 DUPflag : 0
 Distance (au) : 8.248
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.15
 Sun-Target sep (deg) : 176.66
 Sun-Moon sep (deg) : 176.28
 B (ring opening deg) : -10.84
 PA of pole (deg) : -6.17
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.058
 C/A sky separation (km) : 42221.9
 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	2037-02-15T01:12:43.342		74.17	-74.39	140461.00	-42.24		
A (OER)	I	2037-02-15T01:14:11.341		74.27	-74.42	136774.40	-41.53		
Encke (OEG)	I	2037-02-15T01:15:24.836		74.35	-74.45	133744.89	-40.90		
Encke (IEG)	I	2037-02-15T01:15:32.705		74.36	-74.45	133423.31	-40.83		
A (IER)	I	2037-02-15T01:20:21.310		74.63	-74.48	122050.38	-37.85		
B (OER)	I	2037-02-15T01:22:21.993		74.72	-74.47	117571.17	-36.35		
B (IER)	I	2037-02-15T01:37:18.982		74.93	-73.96	91984.69	-18.53		
Saturn	I	2037-02-15T02:08:44.941		72.88	-70.75	60250.60		-16.83	-20.35
Saturn	E	2037-02-15T03:18:26.674		61.31	-58.33	60087.65		-69.05	-72.42
B (IER)	E	2037-02-15T01:57:10.025		73.99	-72.22	91984.69	18.52		
B (OER)	E	2037-02-15T02:12:07.505	b	72.49	-70.28	117571.16	36.33		
A (IER)	E	2037-02-15T02:14:08.275	b	72.25	-69.98	122050.38	37.82		
Encke (IEG)	E	2037-02-15T02:18:57.108	b	71.62	-69.26	133423.31	40.80		
Encke (OEG)	E	2037-02-15T02:19:04.984	b	71.61	-69.24	133744.89	40.87		
A (OER)	E	2037-02-15T02:20:18.541	b	71.44	-69.05	136774.40	41.50		
F ring	E	2037-02-15T02:21:46.620	b	71.24	-68.81	140461.00	42.20		

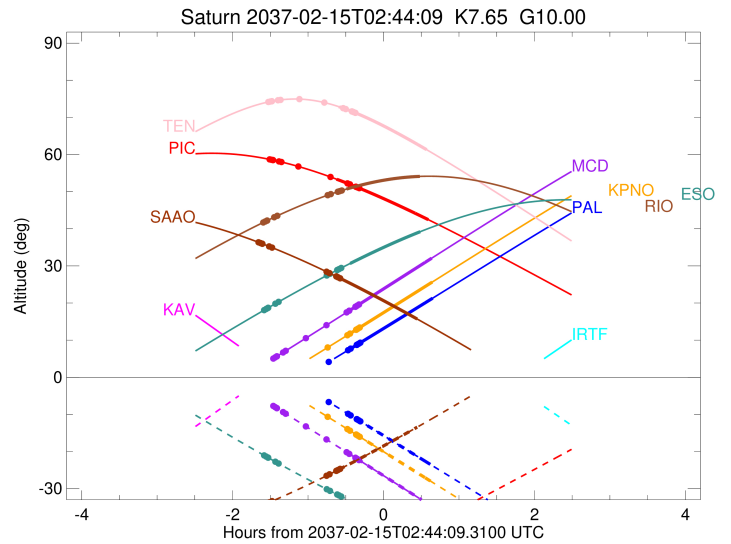
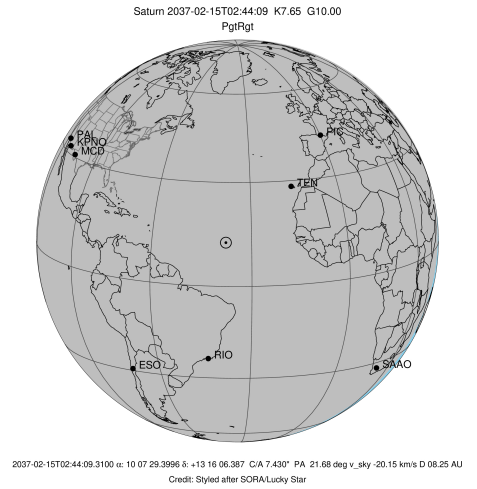
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2037-02-15T02:44:00.460
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 3881962210025024896
 2Mass ID (if available) : 10072943+1316064
 ICRS Star Coord at Epoch: 10h 07m 29.39957s +13:16:06.38730s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 7.654
 G magnitude : 10.003
 RP magnitude : 9.294
 BP magnitude : 10.565
 DUPflag : 0
 Distance (au) : 8.248
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.15
 Sun-Target sep (deg) : 176.66
 Sun-Moon sep (deg) : 176.17
 B (ring opening deg) : -10.84
 PA of pole (deg) : -6.17
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.064
 C/A sky separation (km) : 48238.1
 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

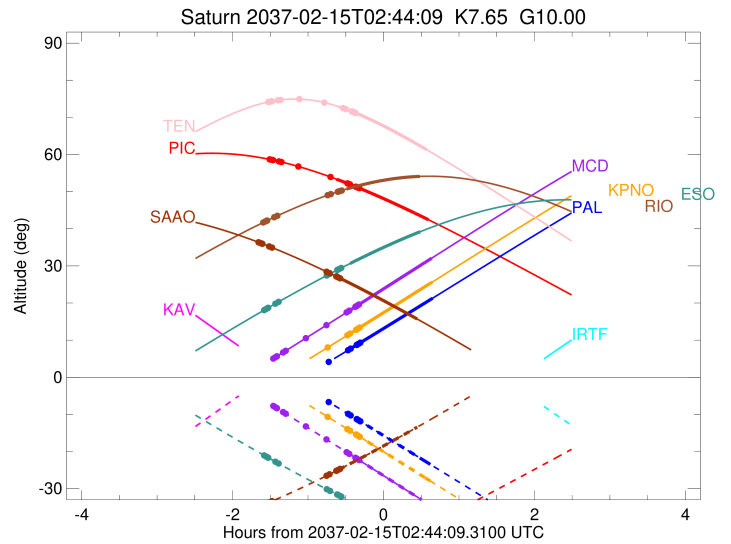
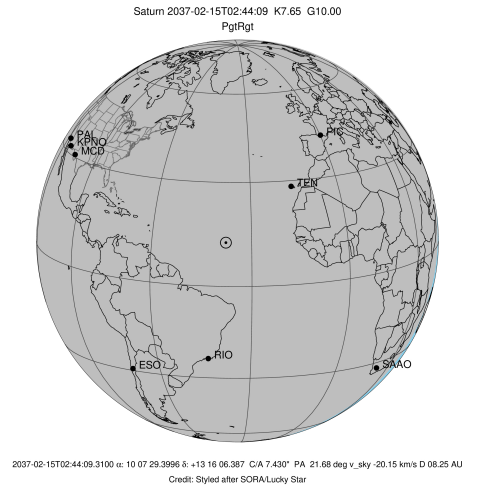
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2037-02-15T01:08:39.051		41.72	-44.29	140461.00	-38.37		
A (OER)	I	2037-02-15T01:10:16.400		41.98	-44.54	136774.40	-37.35		
Encke (OEG)	I	2037-02-15T01:11:38.510		42.21	-44.75	133744.89	-36.43		
Encke (IEG)	I	2037-02-15T01:11:47.350		42.23	-44.77	133423.31	-36.32		
A (IER)	I	2037-02-15T01:17:20.032		43.12	-45.60	122050.38	-31.85		
B (OER)	I	2037-02-15T01:19:46.003		43.50	-45.96	117571.16	-29.48		
Saturn	I	2037-02-15T02:14:44.467		50.70	-52.41	60230.12		-25.29	-30.03
Saturn	E	2037-02-15T03:13:03.262		54.11	-54.63	60073.69		-75.82	-78.18
B (OER)	E	2037-02-15T01:59:50.604		49.06	-51.01	117571.16	29.47		
A (IER)	E	2037-02-15T02:02:16.617		49.34	-51.26	122050.38	31.84		
Encke (IEG)	E	2037-02-15T02:07:49.404		49.97	-51.80	133423.31	36.31		
Encke (OEG)	E	2037-02-15T02:07:58.247		49.99	-51.81	133744.89	36.42		
A (OER)	E	2037-02-15T02:09:20.384		50.13	-51.94	136774.40	37.34		
F ring	E	2037-02-15T02:10:57.766		50.31	-52.08	140461.00	38.36		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2037-02-15T02:45:35.220
 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 : 3881962210025024896
 2Mass ID (if available) : 10072943+1316064
 ICRS Star Coord at Epoch: 10h 07m 29.39957s +13:16:06.38730s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 7.654
 G magnitude : 10.003
 RP magnitude : 9.294
 BP magnitude : 10.565
 DUPflag : 0
 Distance (au) : 8.248
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.15
 Sun-Target sep (deg) : 176.66
 Sun-Moon sep (deg) : 175.84
 B (ring opening deg) : -10.84
 PA of pole (deg) : -6.17
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.260
 C/A sky separation (km) : 49411.3
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2037-02-15T01:09:21.447		18.11	-21.07	140461.00	-37.69		
A (OER)	I	2037-02-15T01:11:00.650		18.43	-21.39	136774.40	-36.62		
Encke (OEG)	I	2037-02-15T01:12:24.490		18.70	-21.65	133744.89	-35.64		
Encke (IEG)	I	2037-02-15T01:12:33.527		18.73	-21.68	133423.31	-35.53		
A (IER)	I	2037-02-15T01:18:15.543		19.83	-22.76	122050.38	-30.76		
B (OER)	I	2037-02-15T01:20:47.325		20.32	-23.24	117571.16	-28.21		
Saturn	I	2037-02-15T02:17:31.502		30.64	-33.27	60225.38		-26.96	-31.88
Saturn	E	2037-02-15T03:13:23.725		39.23	-41.40	60071.64		-77.07	-79.23
B (OER)	E	2037-02-15T01:59:06.868		27.43	-30.17	117571.16	28.23		
A (IER)	E	2037-02-15T02:01:38.563		27.88	-30.60	122050.38	30.78		
Encke (IEG)	E	2037-02-15T02:07:20.333		28.88	-31.57	133423.31	35.56		
Encke (OEG)	E	2037-02-15T02:07:29.362		28.91	-31.60	133744.88	35.67		
A (OER)	E	2037-02-15T02:08:53.131		29.15	-31.84	136774.40	36.65		
F ring	E	2037-02-15T02:10:32.244		29.44	-32.11	140461.00	37.73		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2037-02-15T02:39:51.770
 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 : 3881962210025024896
 2Mass ID (if available) : 10072943+1316064
 ICRS Star Coord at Epoch: 10h 07m 29.39957s +13:16:06.38730s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 7.654
 G magnitude : 10.003
 RP magnitude : 9.294
 BP magnitude : 10.565
 DUPflag : 0
 Distance (au) : 8.248
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.15
 Sun-Target sep (deg) : 176.66
 Sun-Moon sep (deg) : 176.88
 B (ring opening deg) : -10.84
 PA of pole (deg) : -6.17
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.784
 C/A sky separation (km) : 46566.5
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2037-02-15T01:04:53.149		36.34	-34.89	140461.00	-39.16		
A (OER)	I	2037-02-15T01:06:28.401		36.14	-34.67	136774.40	-38.24		
Encke (OEG)	I	2037-02-15T01:07:48.492		35.97	-34.48	133744.89	-37.40		
Encke (IEG)	I	2037-02-15T01:07:57.100		35.95	-34.46	133423.31	-37.31		
A (IER)	I	2037-02-15T01:13:18.289		35.24	-33.70	122050.38	-33.33		
B (OER)	I	2037-02-15T01:15:36.910		34.92	-33.36	117571.17	-31.26		
Saturn	I	2037-02-15T02:08:35.745		26.84	-24.87	60236.79		-22.82	-27.26
Saturn	E	2037-02-15T03:10:59.172		15.68	-13.43	60076.90		-74.03	-76.67
B (OER)	E	2037-02-15T01:58:55.176		28.43	-26.52	117571.16	31.22		
A (IER)	E	2037-02-15T02:01:13.972		28.05	-26.13	122050.38	33.29		
Encke (IEG)	E	2037-02-15T02:06:35.626		27.17	-25.22	133423.31	37.25		
Encke (OEG)	E	2037-02-15T02:06:44.247		27.15	-25.19	133744.89	37.35		
A (OER)	E	2037-02-15T02:08:04.467		26.92	-24.96	136774.40	38.18		
F ring	E	2037-02-15T02:09:39.879	b	26.66	-24.69	140461.00	39.09		