

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2044-04-14T22:35:55.230
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 6260473355767708416
 2Mass ID (if available) : 15471374-1734245

Saturn 2044-04-14T22:35:55 K9.04 G11.61 PgtRgt

ICRS Star Coord at Epoch: 15h 47m 13.76249s -17:34:24.62429s

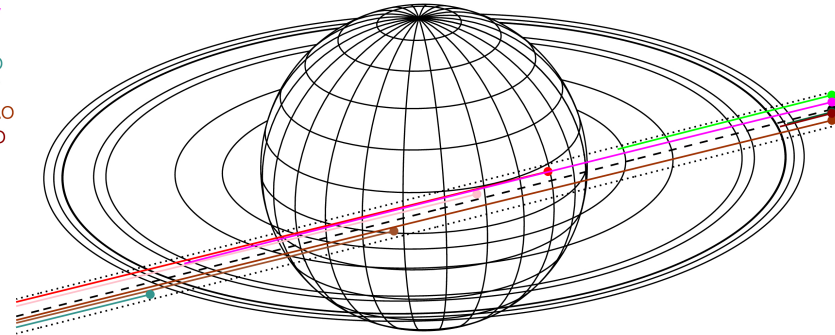
RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.044
 G magnitude : 11.609
 RP magnitude : 10.843
 BP magnitude : 12.250
 DUPflag : 0
 Distance (au) : 9.089
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.26
 Sun-Target sep (deg) : 146.42
 Sun-Moon sep (deg) : 8.30
 B (ring opening deg) : 23.81
 PA of pole (deg) : 1.98

Saturn 2044-04-14T22:35:55 K9.04 G11.61
 PgtRgt



2044-04-14T22:35:55.2300 α: 15 47 13.7625 δ: -17 34 24.624 C/A 2.464° PA 14.24 deg v_sky -15.26 km/s D 09.09 AU
 Credit: Styled after SORA/Lucky Star

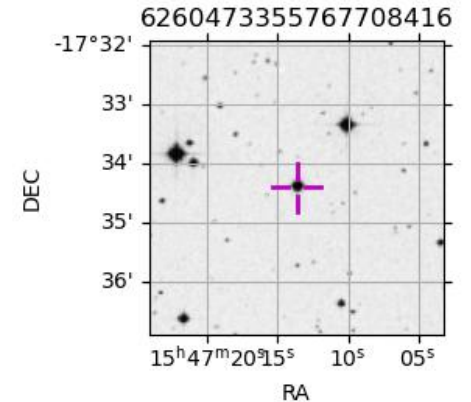
Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



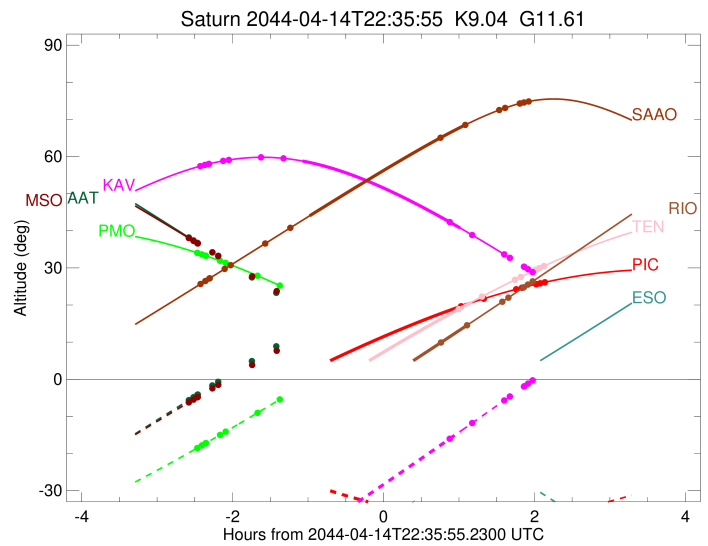
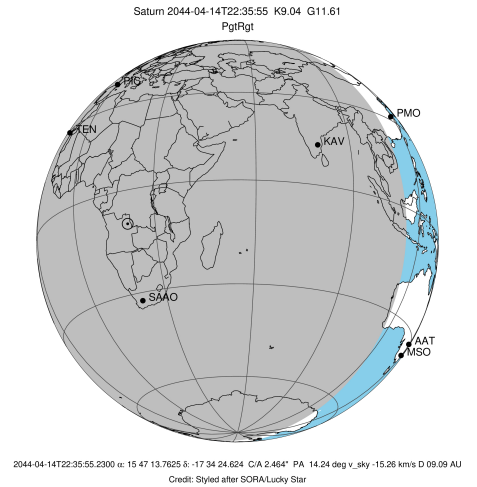
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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		+	+	APR 14 23:44 - APR 15 00:44	PneRne
PAL	Palomar Mt (20	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs	32.1	118.8	+			APR 14 20:07 - APR 14 21:13	PnnRin
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		+	+	APR 14 23:45 - APR 15 00:43	PneRne
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observ	12.6	78.8	+	+	+	APR 14 20:10 - APR 15 00:12	PieRie
RIO	Rio de Janeiro	-22.9	316.8		+	+	APR 14 23:43 - APR 15 00:34	PneRne
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1	+			APR 14 20:01 - APR 14 20:01	PnnRin
SAAO	So. Afr. Astro	-32.4	20.8	+	+	+	APR 14 20:10 - APR 15 00:31	PieRie
MSO	Mt. Stromlo Ob	-35.3	149.0	+	+	+	APR 14 20:01 - APR 14 20:04	PnnRin



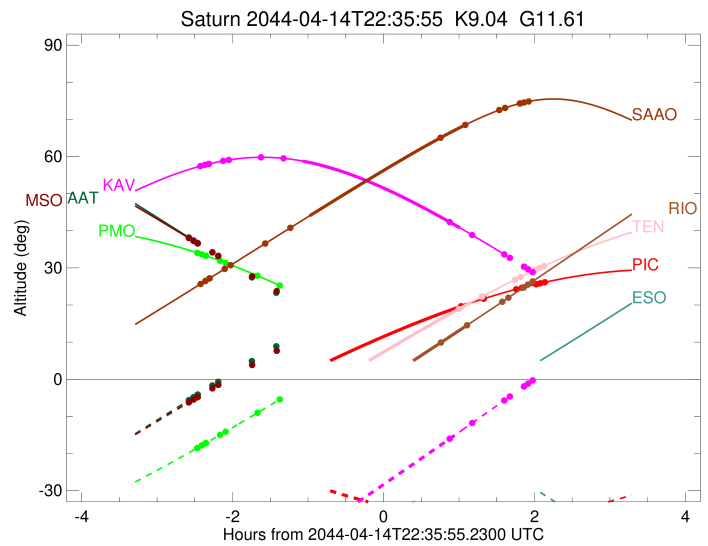
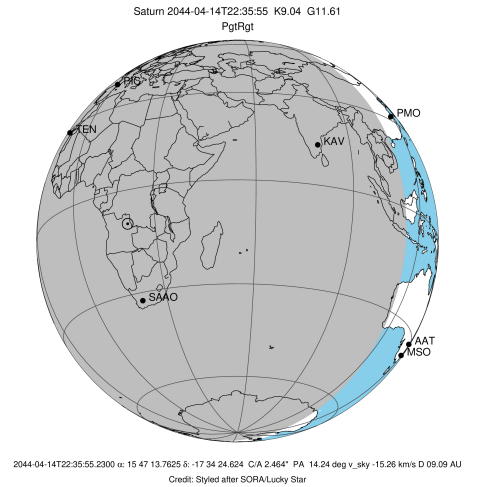
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2044-04-14T22:41:19.280
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 6260473355767708416
 2Mass ID (if available) : 15471374-1734245
 ICRS Star Coord at Epoch: 15h 47m 13.76249s -17:34:24.62429s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.044
 G magnitude : 11.609
 RP magnitude : 10.843
 BP magnitude : 12.250
 DUPflag : 0
 Distance (au) : 9.089
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.26
 Sun-Target sep (deg) : 146.42
 Sun-Moon sep (deg) : 8.48
 B (ring opening deg) : 23.81
 PA of pole (deg) : 1.98
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.870
 C/A sky separation (km) : 12328.0
 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	2044-04-14T20:14:07.037	-11.99x	-16.55	140461.00	-16.44			
A (OER)	I	2044-04-14T20:17:51.371	-11.32x	-17.14	136774.40	-16.43			
Encke (OEG)	I	2044-04-14T20:20:55.858	-10.77x	-17.62	133744.89	-16.42			
Encke (IEG)	I	2044-04-14T20:21:15.448	-10.71x	-17.67	133423.31	-16.41			
A (IER)	I	2044-04-14T20:32:49.426	-8.66x	-19.43	122050.38	-16.36			
B (OER)	I	2044-04-14T20:37:23.466	-7.85x	-20.11	117571.17	-16.33			
B (IER)	I	2044-04-14T21:03:41.404	-3.28x	-23.87	91984.69	-16.06			
C (IER)	I	2044-04-14T21:22:02.833	-0.16x	-26.30	74490.58	-15.66			
Saturn	I	2044-04-14T21:37:25.526	2.39x	-28.20	60268.00	-0.00		-0.00	
Saturn	E	2044-04-14T23:44:40.649	20.48	-37.23	60117.49	-21.52		-25.78	
C (IER)	E	2044-04-14T23:37:37.205	b	19.67	-37.10	74490.58	15.84		
B (IER)	E	2044-04-14T23:55:43.799		21.70	-37.33	91984.69	16.31		
B (OER)	E	2044-04-15T00:21:33.788		24.26	-37.08	117571.16	16.66		
A (IER)	E	2044-04-15T00:26:02.234		24.66	-36.97	122050.38	16.71		
Encke (IEG)	E	2044-04-15T00:37:21.115		25.60	-36.61	133423.31	16.80		
Encke (OEG)	E	2044-04-15T00:37:40.260		25.63	-36.60	133744.89	16.80		
A (OER)	E	2044-04-15T00:40:40.504		25.86	-36.48	136774.40	16.82		
F ring	E	2044-04-15T00:44:19.556		26.14	-36.33	140461.00	16.84		

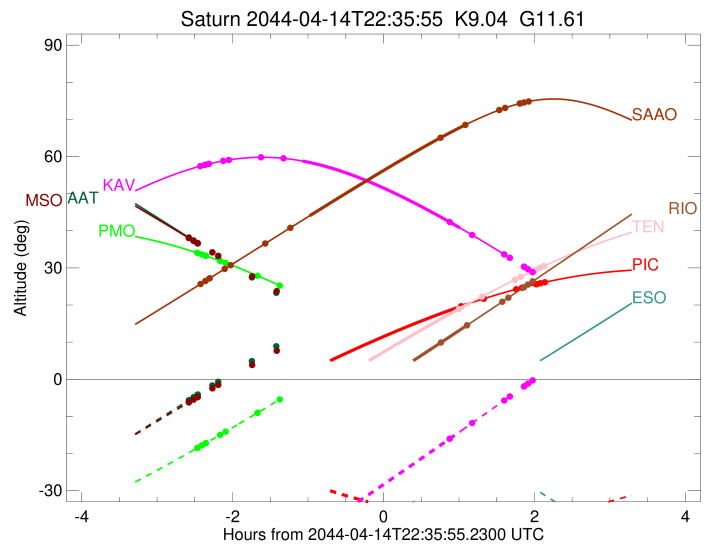
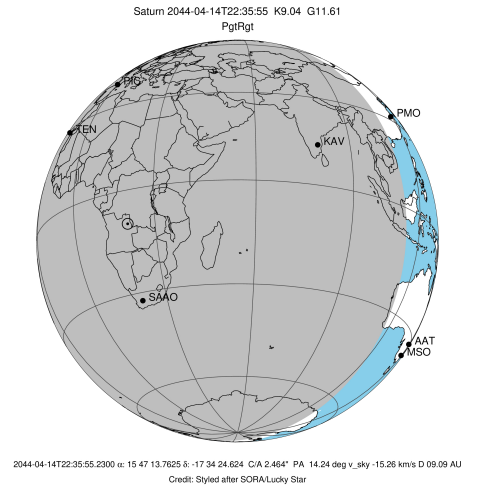
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2044-04-14T22:31:48.310
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 6260473355767708416
 2Mass ID (if available) : 15471374-1734245
 ICRS Star Coord at Epoch: 15h 47m 13.76249s -17:34:24.62429s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.044
 G magnitude : 11.609
 RP magnitude : 10.843
 BP magnitude : 12.250
 DUPflag : 0
 Distance (au) : 9.089
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.26
 Sun-Target sep (deg) : 146.42
 Sun-Moon sep (deg) : 9.20
 B (ring opening deg) : 23.81
 PA of pole (deg) : 1.98
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.705
 C/A sky separation (km) : 11239.7
 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	2044-04-14T20:07:50.900		34.05	-18.52	140461.00	-17.00		
A (OER)	I	2044-04-14T20:11:27.811		33.64	-17.83	136774.40	-16.99		
Encke (OEG)	I	2044-04-14T20:14:26.209		33.30	-17.25	133744.89	-16.97		
Encke (IEG)	I	2044-04-14T20:14:45.154		33.26	-17.19	133423.31	-16.97		
A (IER)	I	2044-04-14T20:25:56.338		31.91	-15.00	122050.38	-16.91		
B (OER)	I	2044-04-14T20:30:21.403		31.35	-14.13	117571.16	-16.88		
B (IER)	I	2044-04-14T20:55:47.192		27.88	-9.04	91984.69	-16.62		
C (IER)	I	2044-04-14T21:13:29.891		25.23	-5.43	74490.58	-16.26		
Saturn	I	2044-04-14T21:28:07.080		22.93	-2.42x	60267.19		1.53	1.89
Saturn	E	2044-04-14T23:35:39.372		-0.45x	24.48x	60120.90		-21.26	-25.48
C (IER)	E	2044-04-14T23:29:08.627	b	0.84x	23.10x	74490.58	16.15		
B (IER)	E	2044-04-14T23:46:59.121		-2.72x	26.88x	91984.69	16.49		
B (OER)	E	2044-04-15T00:12:38.261		-7.92x	32.29x	117571.16	16.72		
A (IER)	E	2044-04-15T00:17:05.931		-8.83x	33.23x	122050.38	16.75		
Encke (IEG)	E	2044-04-15T00:28:24.090		-11.16x	35.59x	133423.31	16.79		
Encke (OEG)	E	2044-04-15T00:28:43.239		-11.23x	35.66x	133744.89	16.79		
A (OER)	E	2044-04-15T00:31:43.587		-11.85x	36.28x	136774.40	16.80		
F ring	E	2044-04-15T00:35:22.919		-12.61x	37.04x	140461.00	16.81		

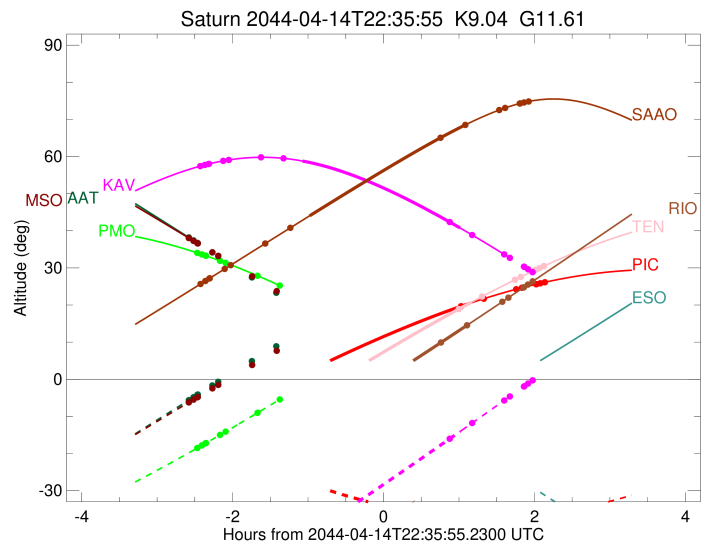
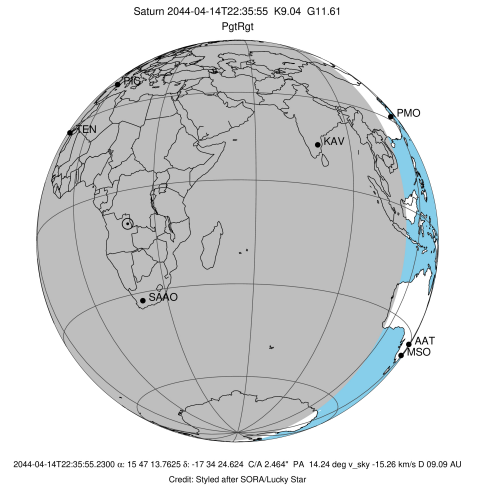
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2044-04-14T22:42:34.130
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 6260473355767708416
 2Mass ID (if available) : 15471374-1734245
 ICRS Star Coord at Epoch: 15h 47m 13.76249s -17:34:24.62429s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.044
 G magnitude : 11.609
 RP magnitude : 10.843
 BP magnitude : 12.250
 DUPflag : 0
 Distance (au) : 9.089
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.26
 Sun-Target sep (deg) : 146.42
 Sun-Moon sep (deg) : 8.17
 B (ring opening deg) : 23.81
 PA of pole (deg) : 1.98
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.148
 C/A sky separation (km) : 14162.0
 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	2044-04-14T20:13:35.297	-22.79x	-9.90	140461.00	-16.21			
A (OER)	I	2044-04-14T20:17:22.888	-21.96x	-10.70	136774.40	-16.19			
Encke (OEG)	I	2044-04-14T20:20:30.117	-21.28x	-11.35	133744.89	-16.17			
Encke (IEG)	I	2044-04-14T20:20:50.003	-21.20x	-11.42	133423.31	-16.17			
A (IER)	I	2044-04-14T20:32:34.931	-18.65x	-13.88	122050.38	-16.09			
B (OER)	I	2044-04-14T20:37:13.604	-17.64x	-14.84	117571.16	-16.05			
B (IER)	I	2044-04-14T21:04:03.360	-11.85x	-20.32	91984.69	-15.69			
C (IER)	I	2044-04-14T21:22:56.154	-7.81x	-24.08	74490.58	-15.14			
Saturn	I	2044-04-14T21:38:46.923	-4.46x	-27.16	60267.04			-1.68	-2.07
Saturn	E	2044-04-14T23:45:40.409	20.73	-47.29	60096.54			-23.05	-27.52
C (IER)	E	2044-04-14T23:35:45.171	b	18.91	-46.15	74490.58	15.35		
B (IER)	E	2044-04-14T23:54:19.977		22.28	-48.19	91984.69	15.98		
B (OER)	E	2044-04-15T00:20:35.750		26.82	-50.39	117571.16	16.45		
A (IER)	E	2044-04-15T00:25:07.626		27.57	-50.68	122050.38	16.50		
Encke (IEG)	E	2044-04-15T00:36:34.216		29.42	-51.28	133423.31	16.62		
Encke (OEG)	E	2044-04-15T00:36:53.561		29.47	-51.29	133744.89	16.62		
A (OER)	E	2044-04-15T00:39:55.640		29.95	-51.42	136774.40	16.65		
F ring	E	2044-04-15T00:43:36.819		30.52	-51.55	140461.00	16.68		

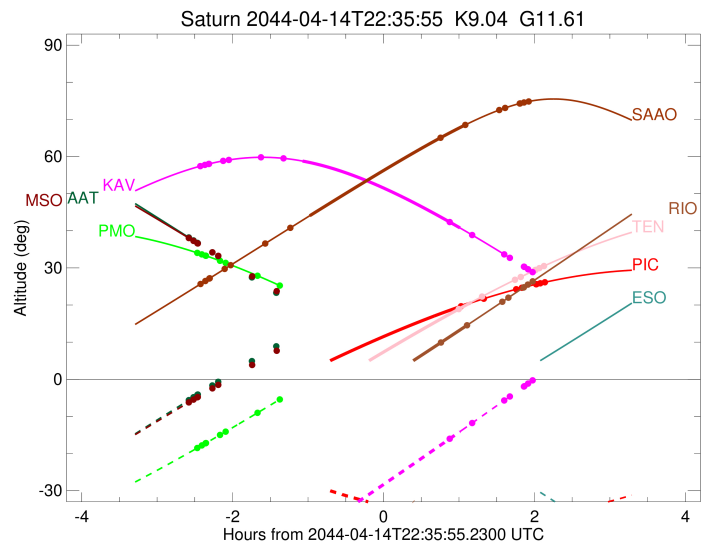
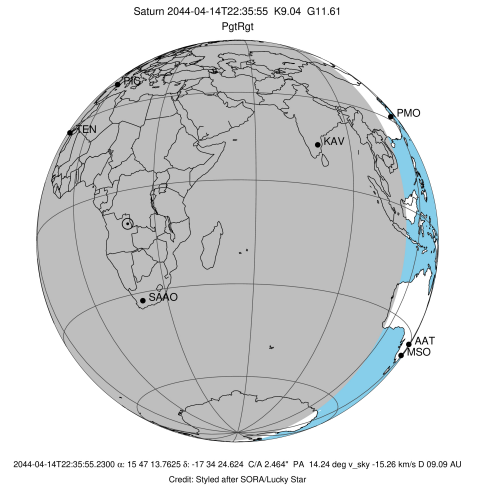
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2044-04-14T22:34:07.090
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 6260473355767708416
 2Mass ID (if available) : 15471374-1734245
 ICRS Star Coord at Epoch: 15h 47m 13.76249s -17:34:24.62429s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.044
 G magnitude : 11.609
 RP magnitude : 10.843
 BP magnitude : 12.250
 DUPflag : 0
 Distance (au) : 9.089
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.26
 Sun-Target sep (deg) : 146.42
 Sun-Moon sep (deg) : 8.96
 B (ring opening deg) : 23.81
 PA of pole (deg) : 1.98
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.923
 C/A sky separation (km) : 12679.0
 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	2044-04-14T20:10:15.670		57.42	-59.14	140461.00	-16.90		
A (OER)	I	2044-04-14T20:13:53.870		57.74	-58.51	136774.40	-16.89		
Encke (OEG)	I	2044-04-14T20:16:53.334		58.00	-57.99	133744.89	-16.87		
Encke (IEG)	I	2044-04-14T20:17:12.393		58.02	-57.93	133423.31	-16.87		
A (IER)	I	2044-04-14T20:28:27.684		58.83	-55.87	122050.38	-16.81		
B (OER)	I	2044-04-14T20:32:54.445		59.08	-55.03	117571.16	-16.77		
B (IER)	I	2044-04-14T20:58:31.992		59.79	-49.92	91984.69	-16.47		
C (IER)	I	2044-04-14T21:16:27.500		59.51	-46.16	74490.58	-16.02		
Saturn	I	2044-04-14T21:31:30.964		58.78	-42.90	60268.00		-0.11	-0.14
Saturn	E	2044-04-14T23:36:39.394		40.79	-14.11	60108.58		-22.18	-26.53
C (IER)	E	2044-04-14T23:28:35.127	b	42.35	-16.02	74490.58	16.03		
B (IER)	E	2044-04-14T23:46:28.745		38.84	-11.78	91984.69	16.50		
B (OER)	E	2044-04-15T00:12:01.806		33.62	-5.68	117571.16	16.83		
A (IER)	E	2044-04-15T00:16:27.621		32.69	-4.62x	122050.38	16.87		
Encke (IEG)	E	2044-04-15T00:27:40.316		30.32	-1.93x	133423.31	16.94		
Encke (OEG)	E	2044-04-15T00:27:59.297		30.25	-1.85x	133744.89	16.94		
A (OER)	E	2044-04-15T00:30:58.022		29.61	-1.14x	136774.40	16.96		
F ring	E	2044-04-15T00:34:35.298		28.84	-0.27x	140461.00	16.98		

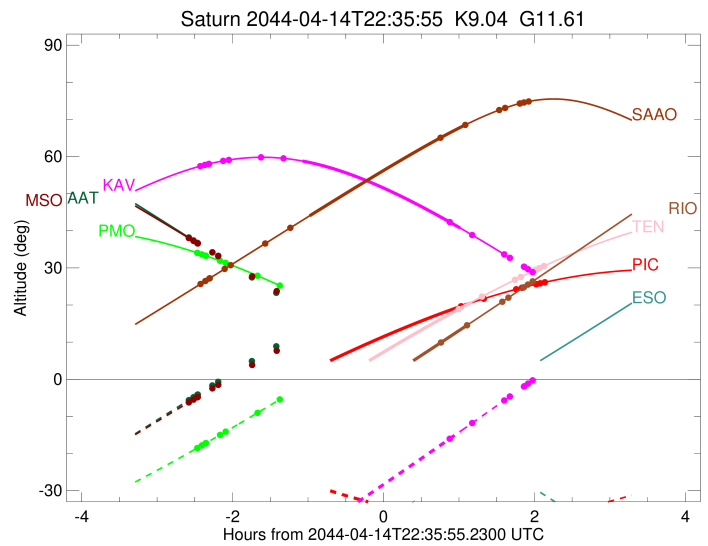
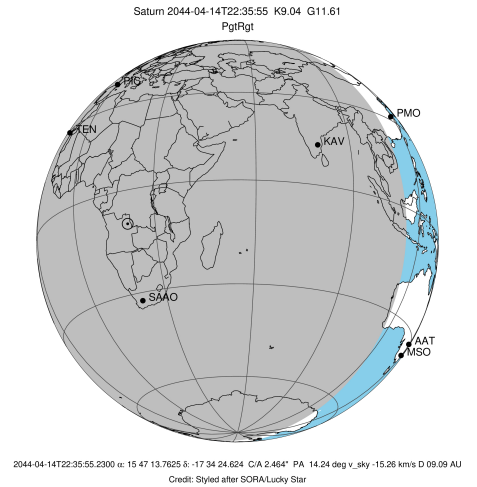
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2044-04-14T22:41:36.040
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 6260473355767708416
 2Mass ID (if available) : 15471374-1734245
 ICRS Star Coord at Epoch: 15h 47m 13.76249s -17:34:24.62429s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.044
 G magnitude : 11.609
 RP magnitude : 10.843
 BP magnitude : 12.250
 DUPflag : 0
 Distance (au) : 9.089
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.26
 Sun-Target sep (deg) : 146.42
 Sun-Moon sep (deg) : 7.46
 B (ring opening deg) : 23.81
 PA of pole (deg) : 1.98
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.054
 C/A sky separation (km) : 20135.0
 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	2044-04-14T20:09:07.870		-30.03x	6.08x	140461.00	-15.62		
A (OER)	I	2044-04-14T20:13:04.219		-29.31x	5.20x	136774.40	-15.57		
Encke (OEG)	I	2044-04-14T20:16:18.988		-28.72x	4.47x	133744.89	-15.53		
Encke (IEG)	I	2044-04-14T20:16:39.693		-28.66x	4.39x	133423.31	-15.53		
A (IER)	I	2044-04-14T20:28:56.292		-26.36x	1.62x	122050.38	-15.34		
B (OER)	I	2044-04-14T20:33:49.100		-25.44x	0.52x	117571.16	-15.25		
B (IER)	I	2044-04-14T21:02:27.978		-19.84x	-6.00	91984.69	-14.41		
C (IER)	I	2044-04-14T21:23:30.280		-15.57x	-10.81	74490.58	-13.17		
Saturn	I	2044-04-14T21:38:58.285		-12.37x	-14.36	60251.50		-6.97	-8.54
Saturn	E	2044-04-14T23:43:26.631		14.79	-43.01	60014.40		-28.47	-33.54
C (IER)	E	2044-04-14T23:21:37.288	b	9.90	-38.01	74490.58	13.28		
B (IER)	E	2044-04-14T23:42:24.710	b	14.56	-42.78	91984.69	14.63		
B (OER)	E	2044-04-15T00:10:32.947		20.92	-49.18	117571.16	15.57		
A (IER)	E	2044-04-15T00:15:19.552		22.00	-50.25	122050.38	15.68		
Encke (IEG)	E	2044-04-15T00:27:19.380		24.73	-52.95	133423.31	15.91		
Encke (OEG)	E	2044-04-15T00:27:39.591		24.81	-53.02	133744.89	15.91		
A (OER)	E	2044-04-15T00:30:49.644		25.53	-53.73	136774.40	15.97		
F ring	E	2044-04-15T00:34:40.123		26.40	-54.59	140461.00	16.02		

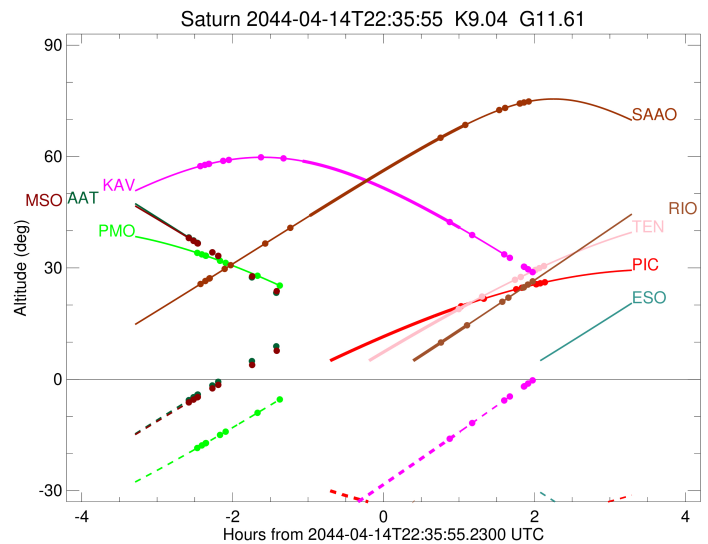
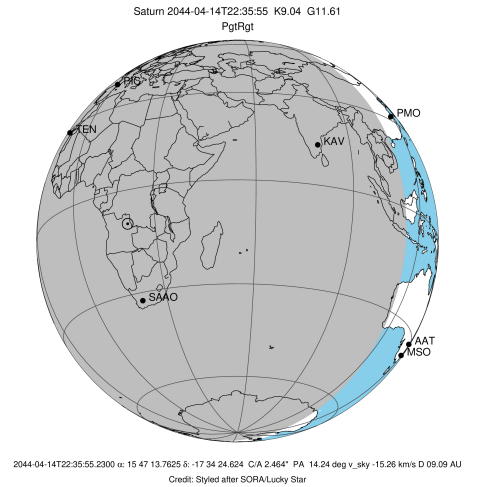
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2044-04-14T22:29:08.050
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 6260473355767708416
 2Mass ID (if available) : 15471374-1734245
 ICRS Star Coord at Epoch: 15h 47m 13.76249s -17:34:24.62429s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.044
 G magnitude : 11.609
 RP magnitude : 10.843
 BP magnitude : 12.250
 DUPflag : 0
 Distance (au) : 9.089
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.26
 Sun-Target sep (deg) : 146.42
 Sun-Moon sep (deg) : 8.57
 B (ring opening deg) : 23.81
 PA of pole (deg) : 1.98
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.737
 C/A sky separation (km) : 18040.7
 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	2044-04-14T20:01:09.316		38.19	-5.62	140461.00	-16.52		
A (OER)	I	2044-04-14T20:04:52.756		37.39	-4.83x	136774.40	-16.48		
Encke (OEG)	I	2044-04-14T20:07:56.818		36.74	-4.18x	133744.89	-16.44		
Encke (IEG)	I	2044-04-14T20:08:16.381		36.67	-4.12x	133423.31	-16.44		
A (IER)	I	2044-04-14T20:19:51.724		34.18	-1.67x	122050.38	-16.27		
B (OER)	I	2044-04-14T20:24:27.722		33.19	-0.71x	117571.16	-16.19		
B (IER)	I	2044-04-14T20:51:19.390		27.43	4.90x	91984.69	-15.48		
C (IER)	I	2044-04-14T21:10:43.263		23.29	8.89x	74490.58	-14.48		
Saturn	I	2044-04-14T21:26:34.282		19.93	12.10x	60261.58		-4.34	-5.33
Saturn	E	2044-04-14T23:31:49.066		-5.75x	35.16x	60030.54		-27.46	-32.44
C (IER)	E	2044-04-14T23:13:04.323	b	-2.06x	32.10x	74490.58	14.31		
B (IER)	E	2044-04-14T23:32:42.570		-5.92x	35.31x	91984.69	15.28		
B (OER)	E	2044-04-14T23:59:57.789		-11.14x	39.38x	117571.16	15.93		
A (IER)	E	2044-04-15T00:04:38.348		-12.02x	40.02x	122050.38	16.00		
Encke (IEG)	E	2044-04-15T00:16:25.894		-14.21x	41.58x	133423.31	16.14		
Encke (OEG)	E	2044-04-15T00:16:45.815		-14.27x	41.62x	133744.89	16.14		
A (OER)	E	2044-04-15T00:19:53.284		-14.84x	42.01x	136774.40	16.18		
F ring	E	2044-04-15T00:23:40.956		-15.53x	42.47x	140461.00	16.21		

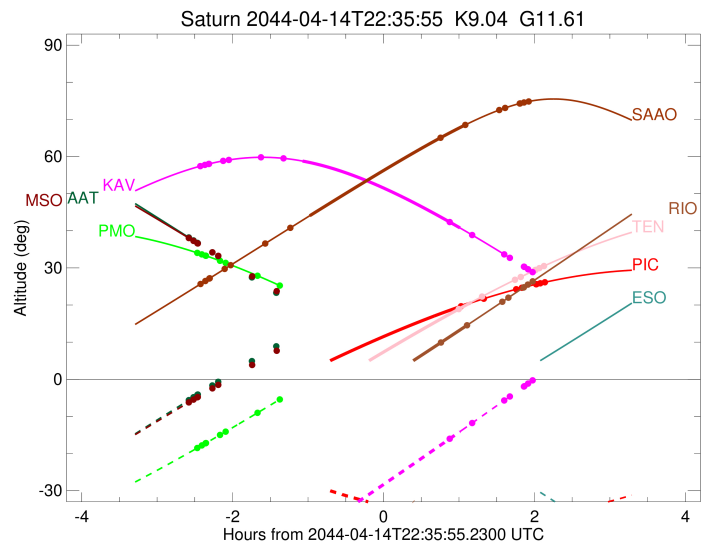
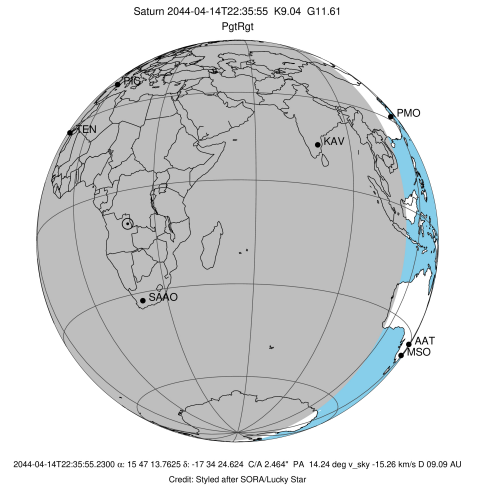
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2044-04-14T22:38:44.640
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 6260473355767708416
 2Mass ID (if available) : 15471374-1734245
 ICRS Star Coord at Epoch: 15h 47m 13.76249s -17:34:24.62429s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.044
 G magnitude : 11.609
 RP magnitude : 10.843
 BP magnitude : 12.250
 DUPflag : 0
 Distance (au) : 9.089
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.26
 Sun-Target sep (deg) : 146.42
 Sun-Moon sep (deg) : 7.91
 B (ring opening deg) : 23.81
 PA of pole (deg) : 1.98
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.847
 C/A sky separation (km) : 18766.7
 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	2044-04-14T20:10:27.829		25.67	-49.54	140461.00	-16.09		
A (OER)	I	2044-04-14T20:14:17.145		26.47	-50.27	136774.40	-16.06		
Encke (OEG)	I	2044-04-14T20:17:26.002		27.14	-50.87	133744.89	-16.02		
Encke (IEG)	I	2044-04-14T20:17:46.073		27.21	-50.93	133423.31	-16.02		
A (IER)	I	2044-04-14T20:29:39.224		29.73	-53.14	122050.38	-15.87		
B (OER)	I	2044-04-14T20:34:22.198		30.73	-54.00	117571.17	-15.79		
B (IER)	I	2044-04-14T21:01:55.123		36.57	-58.73	91984.69	-15.07		
C (IER)	I	2044-04-14T21:21:53.548		40.80	-61.77	74490.58	-14.00		
Saturn	I	2044-04-14T21:37:15.613		44.05	-63.80	60256.26		-5.87	-7.20
Saturn	E	2044-04-14T23:39:40.939		68.30	-63.38	60034.37		-27.22	-32.17
C (IER)	E	2044-04-14T23:21:16.923	b	65.06	-65.44	74490.58	14.13		
B (IER)	E	2044-04-14T23:41:01.550		68.53	-63.21	91984.69	15.29		
B (OER)	E	2044-04-15T00:08:06.550		72.55	-59.31	117571.17	16.11		
A (IER)	E	2044-04-15T00:12:43.867		73.11	-58.57	122050.38	16.20		
Encke (IEG)	E	2044-04-15T00:24:21.702		74.29	-56.62	133423.31	16.39		
Encke (OEG)	E	2044-04-15T00:24:41.320		74.32	-56.57	133744.89	16.39		
A (OER)	E	2044-04-15T00:27:45.864		74.57	-56.04	136774.40	16.44		
F ring	E	2044-04-15T00:31:29.806		74.84	-55.38	140461.00	16.49		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2044-04-14T22:29:18.330
 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 : 6260473355767708416
 2Mass ID (if available) : 15471374-1734245
 ICRS Star Coord at Epoch: 15h 47m 13.76249s -17:34:24.62429s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 9.044
 G magnitude : 11.609
 RP magnitude : 10.843
 BP magnitude : 12.250
 DUPflag : 0
 Distance (au) : 9.089
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.26
 Sun-Target sep (deg) : 146.42
 Sun-Moon sep (deg) : 8.51
 B (ring opening deg) : 23.81
 PA of pole (deg) : 1.98
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.798
 C/A sky separation (km) : 18442.7
 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	2044-04-14T20:01:08.025		38.04	-6.23	140461.00	-16.47		
A (OER)	I	2044-04-14T20:04:52.117		37.28	-5.47	136774.40	-16.43		
Encke (OEG)	I	2044-04-14T20:07:56.736		36.65	-4.85x	133744.89	-16.39		
Encke (IEG)	I	2044-04-14T20:08:16.359		36.58	-4.79x	133423.31	-16.39		
A (IER)	I	2044-04-14T20:19:54.005		34.20	-2.44x	122050.38	-16.21		
B (OER)	I	2044-04-14T20:24:31.016		33.25	-1.52x	117571.17	-16.13		
B (IER)	I	2044-04-14T20:51:30.377		27.72	3.86x	91984.69	-15.39		
C (IER)	I	2044-04-14T21:11:03.338		23.73	7.69x	74490.58	-14.34		
Saturn	I	2044-04-14T21:26:52.242		20.50	10.74x	60260.39		-4.72	-5.80
Saturn	E	2044-04-14T23:31:50.060		-4.01x	32.38x	60025.13		-27.80	-32.81
C (IER)	E	2044-04-14T23:12:18.708	b	-0.34x	29.41x	74490.58	14.17		
B (IER)	E	2044-04-14T23:32:05.548		-4.06x	32.41x	91984.69	15.20		
B (OER)	E	2044-04-14T23:59:27.372		-9.05x	36.19x	117571.16	15.88		
A (IER)	E	2044-04-15T00:04:08.723		-9.89x	36.78x	122050.38	15.96		
Encke (IEG)	E	2044-04-15T00:15:57.970		-11.97x	38.21x	133423.31	16.11		
Encke (OEG)	E	2044-04-15T00:16:17.933		-12.02x	38.25x	133744.89	16.11		
A (OER)	E	2044-04-15T00:19:25.789		-12.57x	38.61x	136774.40	16.14		
F ring	E	2044-04-15T00:23:13.902		-13.22x	39.03x	140461.00	16.18		