

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-10-04T05:48:43.060
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4070223928211293824
 2Mass ID (if available) : 17520348-2235526

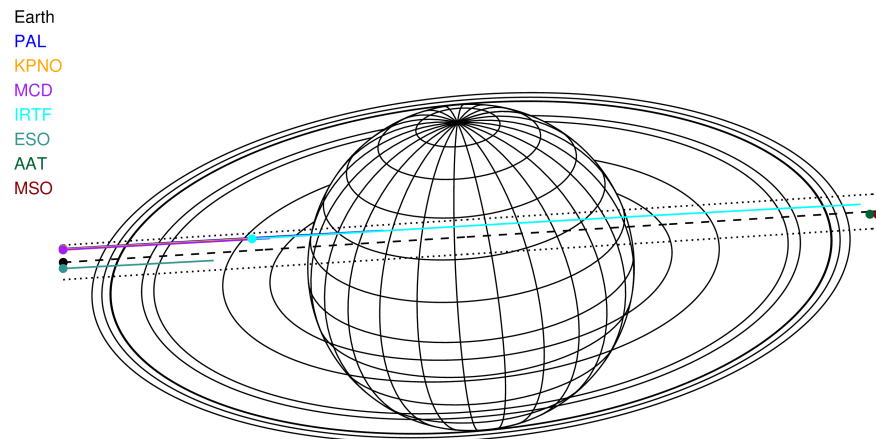
ICRS Star Coord at Epoch: 17h 52m 03.47702s -22:35:52.68114s

RUWE (>1.4 is poor) : 1.00
 K magnitude : 9.694
 G magnitude : 14.417
 RP magnitude : 13.198
 BP magnitude : 16.032
 DUPflag : 0
 Distance (au) : 10.208
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.83
 Sun-Target sep (deg) : 77.89
 Sun-Moon sep (deg) : 104.81
 B (ring opening deg) : 26.91
 PA of pole (deg) : 5.37
 # a(km) ring



2047-10-04T05:48:43.0600 α: 17 52 03.4770 δ: -22 35 52.681 C/A 1.534° PA 183.60 deg v_sky +15.83 km/s D 10.21 AU
 Credit: Styled after SORA/Lucky Star

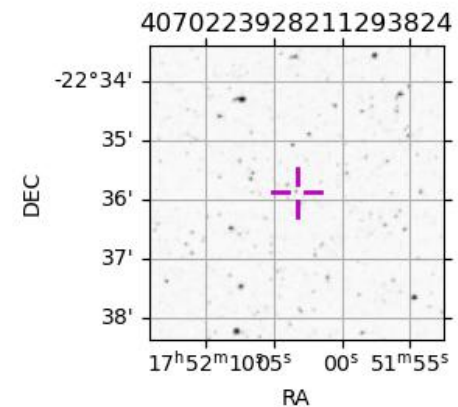
Saturn 2047-10-04T05:48:43 K9.69 G14.42 PgtRgt



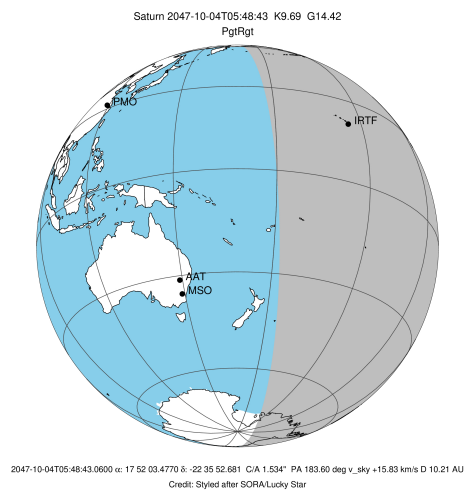
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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

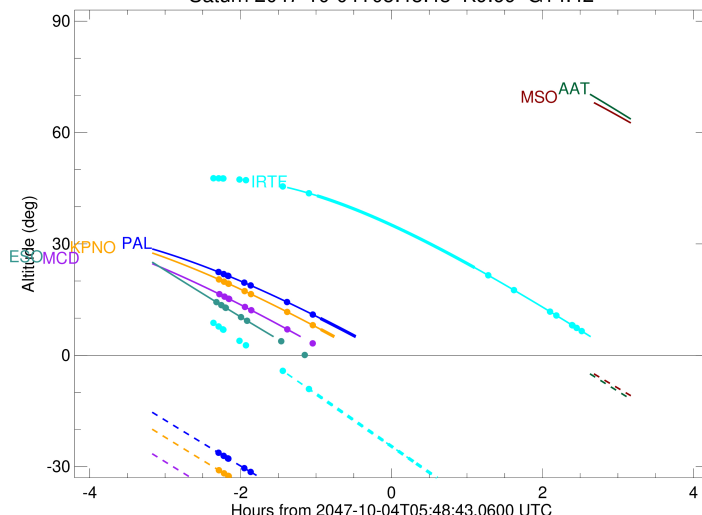
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (20	33.4	243.1	+	+		OCT 04 03:31 - OCT 04 04:52	PinRin
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+	+		OCT 04 03:31 - OCT 04 04:52	PinRin
MCD	McDonald Obs.	30.7	256.0	+	+		OCT 04 03:31 - OCT 04 04:25	PnnRin
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5		+	+	OCT 04 04:43 - OCT 04 08:19	PieRie
KAV	Kavalur Observ	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3	+	+		OCT 04 03:29 - OCT 04 03:53	PnnRin
AAT	Siding Spring	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0					PnnRnn



target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-10-04T05:54:04.110
 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 : 4070223928211293824
 2Mass ID (if available) : 17520348-2235526
 ICRS Star Coord at Epoch: 17h 52m 03.47702s -22:35:52.68114s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 9.694
 G magnitude : 14.417
 RP magnitude : 13.198
 BP magnitude : 16.032
 DUPflag : 0
 Distance (au) : 10.208
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.83
 Sun-Target sep (deg) : 77.89
 Sun-Moon sep (deg) : 105.01
 B (ring opening deg) : 26.91
 PA of pole (deg) : 5.37
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.076
 C/A sky separation (km) : 15370.9
 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

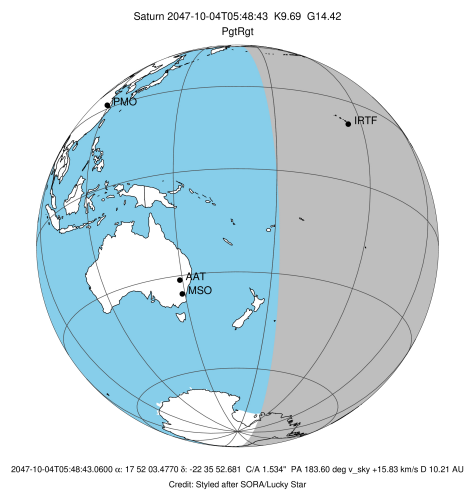


Saturn 2047-10-04T05:48:43 K9.69 G14.42

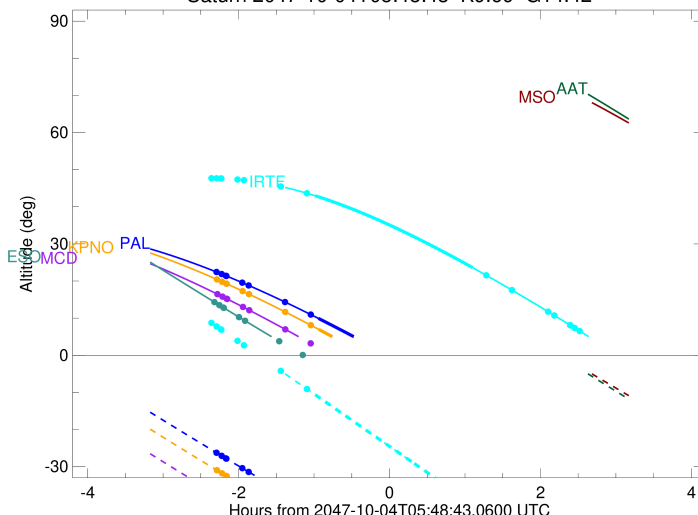


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-10-04T03:31:14.754		22.42	-26.27	140461.00	-15.04		
A (OER)	I	2047-10-04T03:35:19.977		21.87	-27.11	136774.40	-15.02		
Encke (OEG)	I	2047-10-04T03:38:41.741		21.41	-27.79	133744.89	-15.01		
Encke (IEG)	I	2047-10-04T03:39:03.172		21.36	-27.86	133423.31	-15.00		
A (IER)	I	2047-10-04T03:51:43.111		19.55	-30.42	122050.38	-14.92		
B (OER)	I	2047-10-04T03:56:43.680		18.82	-31.43	117571.16	-14.88		
B (IER)	I	2047-10-04T04:25:42.614		14.33	-37.14	91984.69	-14.49		
C (IER)	I	2047-10-04T04:46:11.628		10.95	-41.04	74490.58	-13.91		
Saturn	I	2047-10-04T04:52:12.056		9.93	-42.16	60166.18		15.12	18.34
Saturn	E	2047-10-04T06:55:30.327	-13.10x	-59.65	60211.95			11.15	13.61
C (IER)	E	2047-10-04T07:06:16.825	-15.25x	-60.34	74490.58		14.17		
B (IER)	E	2047-10-04T07:26:20.088	-19.29x	-61.09	91984.69		14.84		
B (OER)	E	2047-10-04T07:54:32.445	-25.05x	-60.87	117571.16		15.34		
A (IER)	E	2047-10-04T07:59:23.794	-26.04x	-60.68	122050.38		15.40		
Encke (IEG)	E	2047-10-04T08:11:38.937	-28.57x	-60.02	133423.31		15.53		
Encke (OEG)	E	2047-10-04T08:11:59.638	-28.64x	-60.00	133744.89		15.54		
A (OER)	E	2047-10-04T08:15:14.452	-29.32x	-59.78	136774.40		15.57		
F ring	E	2047-10-04T08:19:11.034	-30.13x	-59.49	140461.00		15.60		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-10-04T05:54:16.910
 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 : 4070223928211293824
 2Mass ID (if available) : 17520348-2235526
 ICRS Star Coord at Epoch: 17h 52m 03.47702s -22:35:52.68114s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 9.694
 G magnitude : 14.417
 RP magnitude : 13.198
 BP magnitude : 16.032
 DUPflag : 0
 Distance (au) : 10.208
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.83
 Sun-Target sep (deg) : 77.89
 Sun-Moon sep (deg) : 104.96
 B (ring opening deg) : 26.91
 PA of pole (deg) : 5.37
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.037
 C/A sky separation (km) : 15080.7
 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

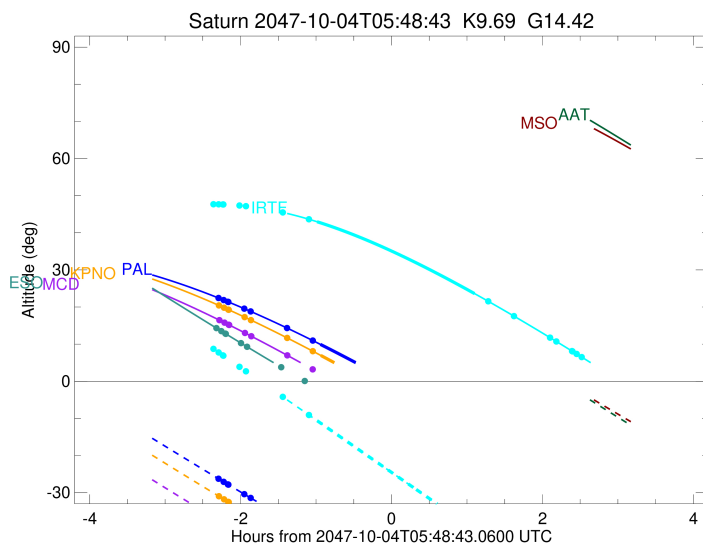
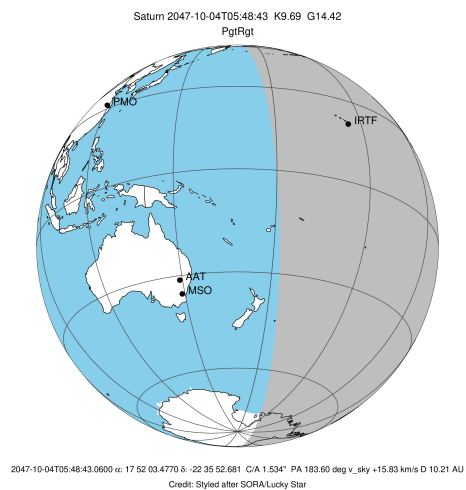


Saturn 2047-10-04T05:48:43 K9.69 G14.42



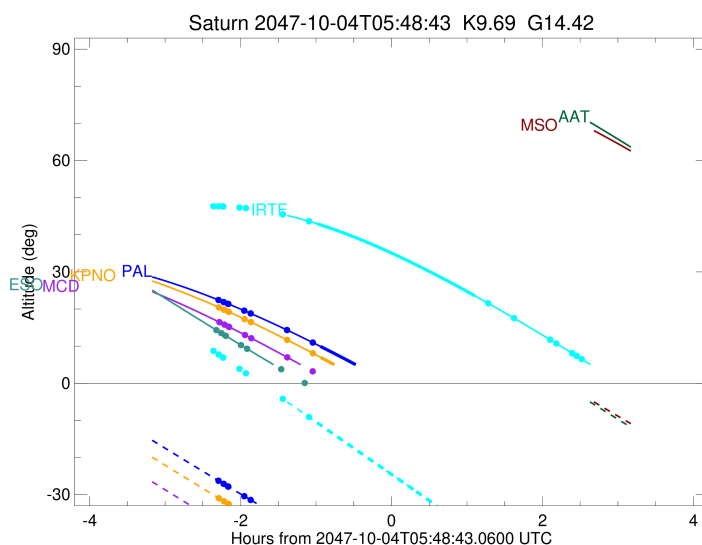
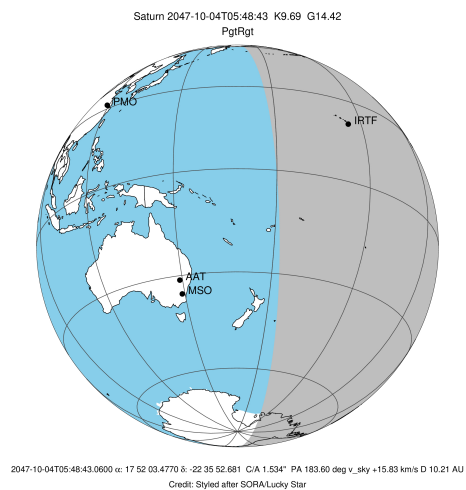
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-10-04T03:31:33.527		20.42	-30.98	140461.00	-15.08		
A (OER)	I	2047-10-04T03:35:38.083		19.81	-31.81	136774.40	-15.07		
Encke (OEG)	I	2047-10-04T03:38:59.278		19.30	-32.50	133744.89	-15.05		
Encke (IEG)	I	2047-10-04T03:39:20.647		19.25	-32.57	133423.31	-15.05		
A (IER)	I	2047-10-04T03:51:58.267		17.28	-35.12	122050.38	-14.97		
B (OER)	I	2047-10-04T03:56:57.835		16.48	-36.12	117571.16	-14.93		
B (IER)	I	2047-10-04T04:25:49.716		11.67	-41.78	91984.69	-14.56		
C (IER)	I	2047-10-04T04:46:11.644		8.09	-45.60	74490.58	-14.01		
Saturn	I	2047-10-04T04:52:27.496		6.97	-46.74	60169.12		14.90	18.08
Saturn	E	2047-10-04T06:55:39.692		-16.94x	-62.18	60214.59		10.88	13.28
C (IER)	E	2047-10-04T07:06:38.069		-19.19x	-62.49	74490.58	14.28		
B (IER)	E	2047-10-04T07:26:33.790		-23.31x	-62.44	91984.69	14.92		
B (OER)	E	2047-10-04T07:54:38.238		-29.17x	-61.05	117571.16	15.41		
A (IER)	E	2047-10-04T07:59:28.413		-30.18x	-60.67	122050.38	15.46		
Encke (IEG)	E	2047-10-04T08:11:40.767		-32.76x	-59.54	133423.31	15.59		
Encke (OEG)	E	2047-10-04T08:12:01.393		-32.83x	-59.50	133744.89	15.59		
A (OER)	E	2047-10-04T08:15:15.505		-33.51x	-59.16	136774.40	15.62		
F ring	E	2047-10-04T08:19:11.254		-34.34x	-58.73	140461.00	15.65		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-10-04T05:54:27.180
 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 : 4070223928211293824
 2Mass ID (if available) : 17520348-2235526
 ICRS Star Coord at Epoch: 17h 52m 03.47702s -22:35:52.68114s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 9.694
 G magnitude : 14.417
 RP magnitude : 13.198
 BP magnitude : 16.032
 DUPflag : 0
 Distance (au) : 10.208
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.83
 Sun-Target sep (deg) : 77.89
 Sun-Moon sep (deg) : 104.88
 B (ring opening deg) : 26.91
 PA of pole (deg) : 5.37
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.986
 C/A sky separation (km) : 14701.2
 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	2047-10-04T03:31:56.344		16.46	-37.62	140461.00	-15.15		
A (OER)	I	2047-10-04T03:35:59.870		15.78	-38.44	136774.40	-15.13		
Encke (OEG)	I	2047-10-04T03:39:20.195		15.22	-39.12	133744.89	-15.12		
Encke (IEG)	I	2047-10-04T03:39:41.470		15.16	-39.19	133423.31	-15.11		
A (IER)	I	2047-10-04T03:52:15.590		13.00	-41.68	122050.38	-15.04		
B (OER)	I	2047-10-04T03:57:13.671		12.14	-42.66	117571.16	-15.01		
B (IER)	I	2047-10-04T04:25:55.401		6.97	-48.10	91984.69	-14.66		
C (IER)	I	2047-10-04T04:46:07.579		3.19x	-51.70	74490.58	-14.14		
Saturn	I	2047-10-04T04:52:43.297		1.94x	-52.81	60172.99		14.60	17.72
Saturn	E	2047-10-04T06:55:43.878		-22.89x	-63.72	60217.87		10.54	12.87
C (IER)	E	2047-10-04T07:06:56.306		-25.24x	-63.33	74490.58	14.42		
B (IER)	E	2047-10-04T07:26:42.146		-29.43x	-62.05	91984.69	15.03		
B (OER)	E	2047-10-04T07:54:36.167		-35.38x	-59.11	117571.16	15.49		
A (IER)	E	2047-10-04T07:59:24.797		-36.41x	-58.49	122050.38	15.55		
Encke (IEG)	E	2047-10-04T08:11:33.483		-39.02x	-56.81	133423.31	15.66		
Encke (OEG)	E	2047-10-04T08:11:54.010		-39.09x	-56.77	133744.89	15.67		
A (OER)	E	2047-10-04T08:15:07.203		-39.78x	-56.29	136774.40	15.69		
F ring	E	2047-10-04T08:19:01.859		-40.63x	-55.70	140461.00	15.73		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-10-04T05:52:20.760
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 4070223928211293824
 2Mass ID (if available) : 17520348-2235526
 ICRS Star Coord at Epoch: 17h 52m 03.47702s -22:35:52.68114s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 9.694
 G magnitude : 14.417
 RP magnitude : 13.198
 BP magnitude : 16.032
 DUPflag : 0
 Distance (au) : 10.208
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 15.83
 Sun-Target sep (deg) : 77.89
 Sun-Moon sep (deg) : 105.46
 B (ring opening deg) : 26.91
 PA of pole (deg) : 5.37
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.079
 C/A sky separation (km) : 15391.8
 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	2047-10-04T03:27:11.983		47.69	8.72x	140461.00	-14.89		
A (OER)	I	2047-10-04T03:31:19.839		47.67	7.75x	136774.40	-14.86		
Encke (OEG)	I	2047-10-04T03:34:43.825		47.63	6.96x	133744.89	-14.84		
Encke (IEG)	I	2047-10-04T03:35:05.495		47.63	6.87x	133423.31	-14.84		
A (IER)	I	2047-10-04T03:47:54.270		47.34	3.87x	122050.38	-14.74		
B (OER)	I	2047-10-04T03:52:58.525		47.17	2.69x	117571.16	-14.70		
B (IER)	I	2047-10-04T04:22:20.819		45.47	-4.21x	91984.69	-14.29		
C (IER)	I	2047-10-04T04:43:08.362		43.64	-9.10	74490.58	-13.69		
Saturn	I	2047-10-04T04:49:31.626		42.98	-10.61	60168.89		14.91	18.10
Saturn	E	2047-10-04T06:54:50.431		23.60	-39.96	60210.35		11.31	13.80
C (IER)	E	2047-10-04T07:05:39.021		21.54	-42.45	74490.58	13.90		
B (IER)	E	2047-10-04T07:26:05.761		17.55	-47.12	91984.69	14.56		
B (OER)	E	2047-10-04T07:54:50.554		11.74	-53.57	117571.16	15.06		
A (IER)	E	2047-10-04T07:59:47.401		10.72	-54.65	122050.38	15.12		
Encke (IEG)	E	2047-10-04T08:12:16.280		8.12	-57.37	133423.31	15.25		
Encke (OEG)	E	2047-10-04T08:12:37.365		8.05	-57.44	133744.89	15.25		
A (OER)	E	2047-10-04T08:15:55.780		7.36	-58.15	136774.40	15.28		
F ring	E	2047-10-04T08:19:56.714		6.51	-59.00	140461.00	15.32		

