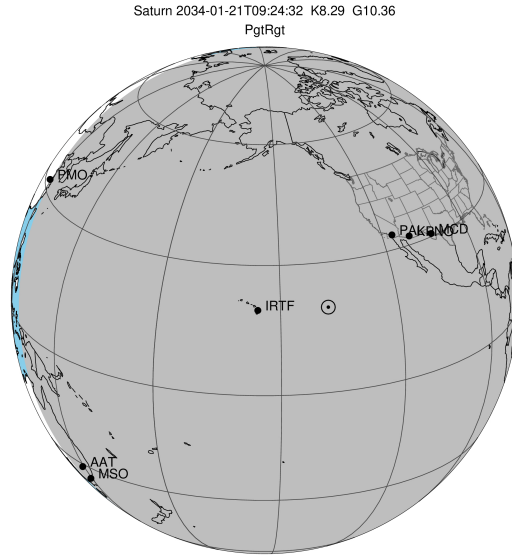


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2034-01-21T09:24:32.870
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3367394105417878272
 2Mass ID (if available) : 07103042+2210114

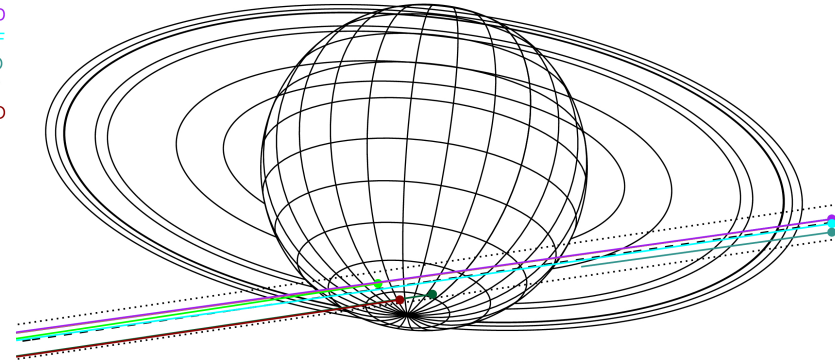
Saturn 2034-01-21T09:24:32 K8.29 G10.36 PgtRgt

ICRS Star Coord at Epoch: 07h 10m 30.34679s +22:10:10.40158s

RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.294
 G magnitude : 10.363
 RP magnitude : 9.684
 BP magnitude : 10.897
 DUPflag : 0
 Distance (au) : 8.077
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.18
 Sun-Target sep (deg) : 165.36
 Sun-Moon sep (deg) : 152.82
 B (ring opening deg) : -24.57
 PA of pole (deg) : -6.58



Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 ESO
 AAT
 MSO

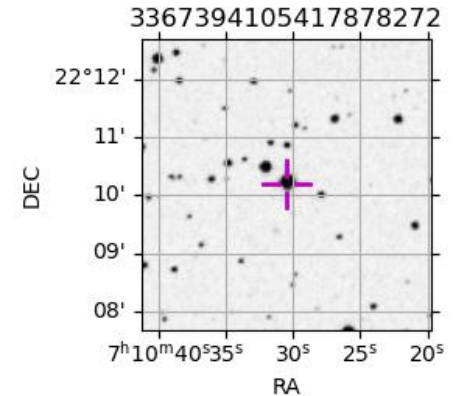


2034-01-21T09:24:32.8700 a: 07 10 30.3468 & +22 10 10.402 C/A 7.158° PA 8.33 deg v_sky -19.18 km/s D 08.08 AU
 Credit: Styled after SORA/Lucky Star

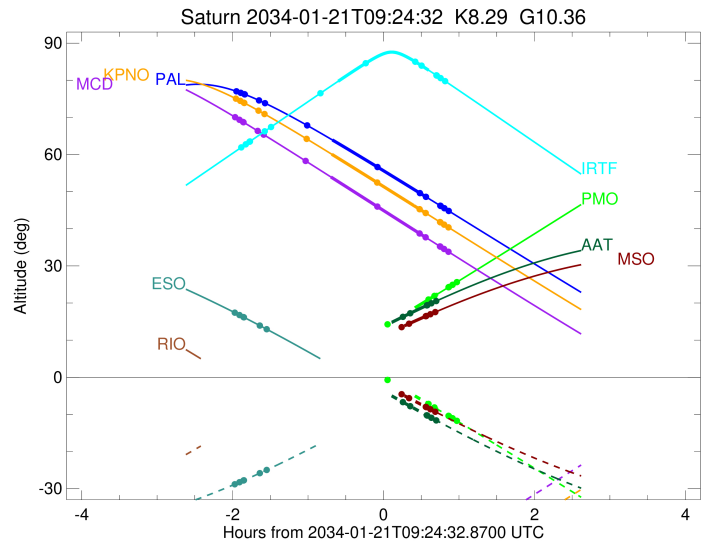
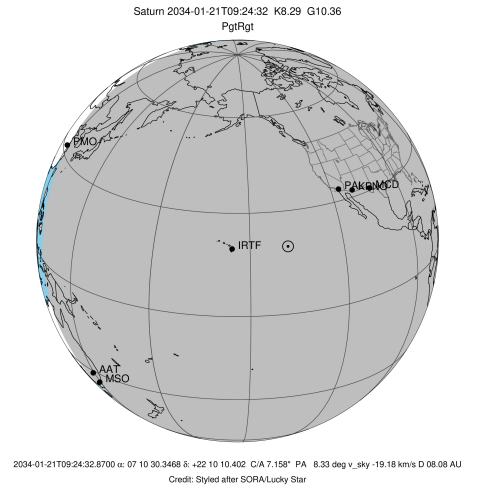
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	+ + + + +	+ +	+ + + +	JAN 21 07:27 - JAN 21 10:16	PieRie
PMO	Purple Mtn Obs	32.1	118.8		+	+ + + +	JAN 21 10:07 - JAN 21 10:22	PneRne
KPNO	Kitt Peak Natl	32.0	248.4	+ + + + +	+ +	+ + + +	JAN 21 07:27 - JAN 21 10:16	PieRie
MCD	McDonald Obs.	30.7	256.0	+ + + + +	+ +	+ + + +	JAN 21 07:26 - JAN 21 10:16	PieRie
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ + + + +	+ +	+ + + +	JAN 21 07:31 - JAN 21 10:13	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	+ + + + +			JAN 21 07:26 - JAN 21 07:51	PnnRin
AAT	Siding Spring	-31.3	149.1		+	+ + +	JAN 21 09:59 - JAN 21 10:06	PneRne
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0		+	+ +	JAN 21 09:58 - JAN 21 10:05	PneRne

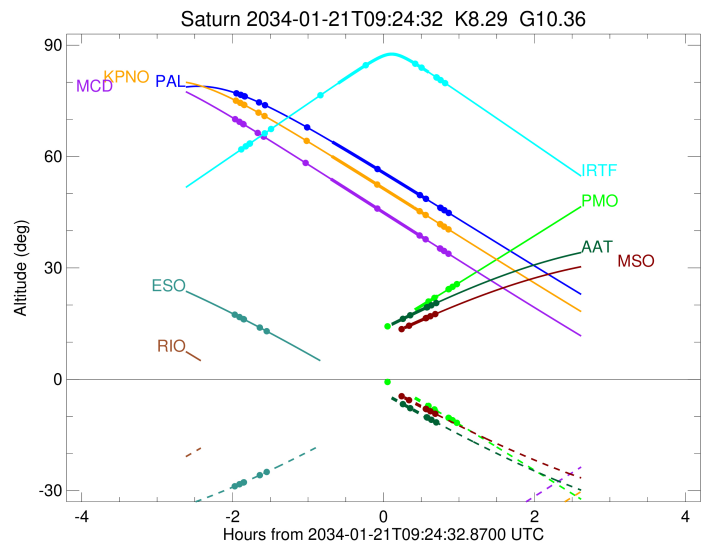
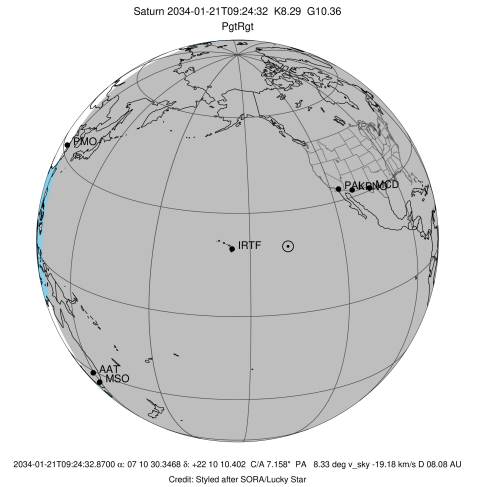


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2034-01-21T09:22:16.250
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3367394105417878272
 2Mass ID (if available) : 07103042+2210114
 ICRS Star Coord at Epoch: 07h 10m 30.34679s +22:10:10.40158s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.294
 G magnitude : 10.363
 RP magnitude : 9.684
 BP magnitude : 10.897
 DUPflag : 0
 Distance (au) : 8.077
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.18
 Sun-Target sep (deg) : 165.36
 Sun-Moon sep (deg) : 152.82
 B (ring opening deg) : -24.57
 PA of pole (deg) : -6.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.804
 C/A sky separation (km) : 39856.0
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2034-01-21T07:27:37.270		77.03	-74.99	140461.00	-17.90		
A (OER)	I	2034-01-21T07:31:04.837		76.62	-75.33	136774.40	-17.62		
Encke (OEG)	I	2034-01-21T07:33:57.977		76.25	-75.59	133744.89	-17.37		
Encke (IEG)	I	2034-01-21T07:34:16.504		76.21	-75.61	133423.31	-17.34		
A (IER)	I	2034-01-21T07:45:33.880		74.59	-76.36	122050.38	-16.18		
B (OER)	I	2034-01-21T07:50:15.601		73.85	-76.55	117571.16	-15.60		
B (IER)	I	2034-01-21T08:23:46.801		67.86	-75.54	91984.69	-9.05		
Saturn	I	2034-01-21T08:43:50.590		63.94	-73.30	60061.56		-24.45	-29.09
Saturn	E	2034-01-21T10:00:14.099		48.20	-59.87	59583.76		-49.29	-54.67
B (IER)	E	2034-01-21T09:19:41.653	b	56.65	-67.57	91984.69	9.00		
B (OER)	E	2034-01-21T09:53:30.051	b	49.61	-61.20	117571.16	15.45		
A (IER)	E	2034-01-21T09:58:14.702	b	48.61	-60.26	122050.38	16.02		
Encke (IEG)	E	2034-01-21T10:09:39.490		46.22	-57.99	133423.31	17.15		
Encke (OEG)	E	2034-01-21T10:09:58.228		46.16	-57.92	133744.89	17.18		
A (OER)	E	2034-01-21T10:12:53.362		45.54	-57.34	136774.40	17.42		
F ring	E	2034-01-21T10:16:23.377		44.81	-56.63	140461.00	17.69		

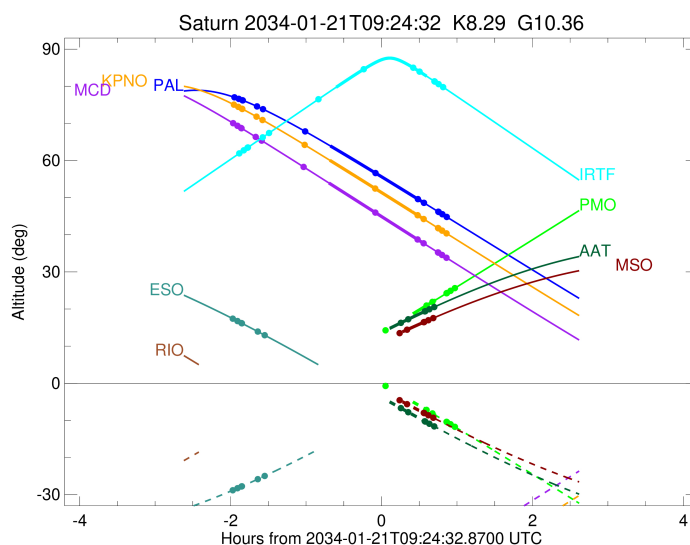
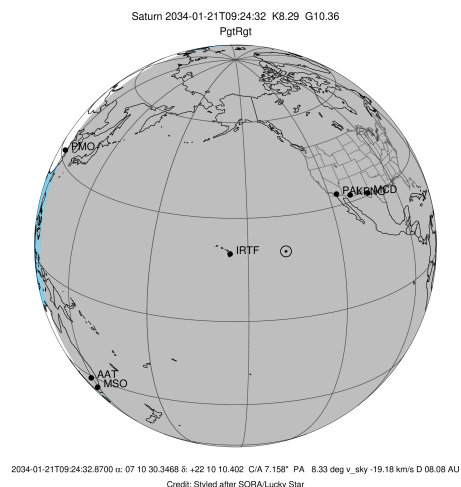
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2034-01-21T09:29:18.940
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3367394105417878272
 2Mass ID (if available) : 07103042+2210114
 ICRS Star Coord at Epoch: 07h 10m 30.34679s +22:10:10.40158s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.294
 G magnitude : 10.363
 RP magnitude : 9.684
 BP magnitude : 10.897
 DUPflag : 0
 Distance (au) : 8.077
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.18
 Sun-Target sep (deg) : 165.36
 Sun-Moon sep (deg) : 153.74
 B (ring opening deg) : -24.57
 PA of pole (deg) : -6.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.790
 C/A sky separation (km) : 39773.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



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

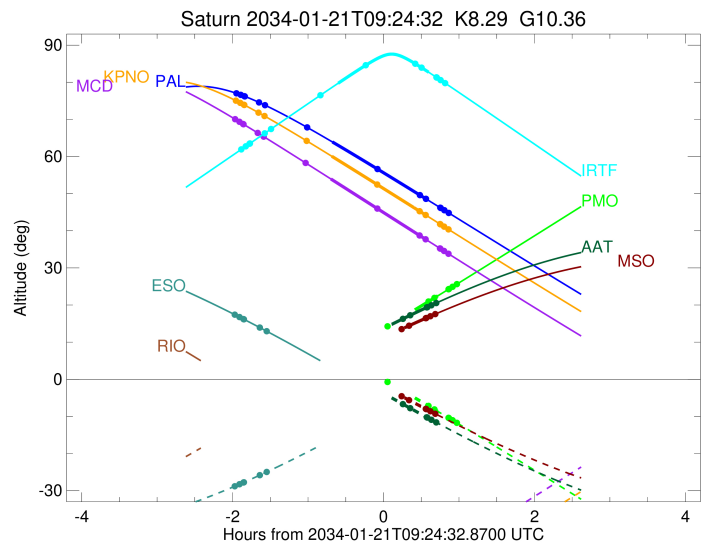
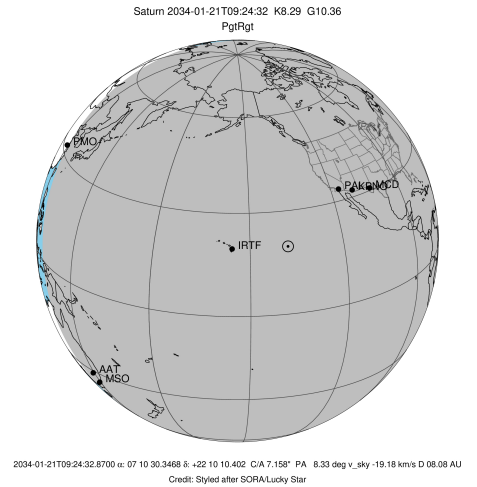
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2034-01-21T07:32:03.614		-8.07x	20.12x	140461.00	-17.78		
A (OER)	I	2034-01-21T07:35:32.454		-7.45x	19.56x	136774.40	-17.52		
Encke (OEG)	I	2034-01-21T07:38:26.472		-6.92x	19.09x	133744.89	-17.29		
Encke (IEG)	I	2034-01-21T07:38:45.082		-6.86x	19.04x	133423.31	-17.27		
A (IER)	I	2034-01-21T07:50:03.902		-4.79x	17.16x	122050.38	-16.19		
B (OER)	I	2034-01-21T07:54:45.139		-3.92x	16.37x	117571.16	-15.65		
B (IER)	I	2034-01-21T08:27:31.810		2.30x	10.62x	91984.69	-9.62		
Saturn	I	2034-01-21T08:50:12.572		6.73	6.45x	60074.37		-23.63	-28.17
Saturn	E	2034-01-21T10:07:43.017		22.47	-8.66	59572.67		-49.84	-55.19
B (IER)	E	2034-01-21T09:27:41.366	b	14.24	-0.71x	91984.69	9.64		
B (OER)	E	2034-01-21T10:00:20.609	b	20.94	-7.18	117571.16	15.75		
A (IER)	E	2034-01-21T10:04:59.937	b	21.90	-8.12	122050.38	16.31		
Encke (IEG)	E	2034-01-21T10:16:13.147		24.24	-10.38	133423.31	17.43		
Encke (OEG)	E	2034-01-21T10:16:31.583		24.30	-10.45	133744.89	17.46		
A (OER)	E	2034-01-21T10:19:23.938		24.90	-11.03	136774.40	17.70		
F ring	E	2034-01-21T10:22:50.674		25.62	-11.73	140461.00	17.97		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2034-01-21T09:21:54.810
 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 : 3367394105417878272
 2Mass ID (if available) : 07103042+2210114
 ICRS Star Coord at Epoch: 07h 10m 30.34679s +22:10:10.40158s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.294
 G magnitude : 10.363
 RP magnitude : 9.684
 BP magnitude : 10.897
 DUPflag : 0
 Distance (au) : 8.077
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.18
 Sun-Target sep (deg) : 165.36
 Sun-Moon sep (deg) : 152.75
 B (ring opening deg) : -24.57
 PA of pole (deg) : -6.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.798
 C/A sky separation (km) : 39821.9
 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



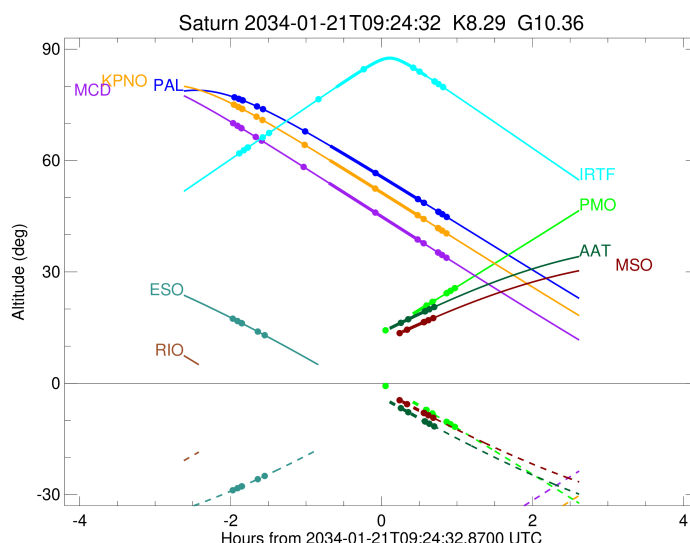
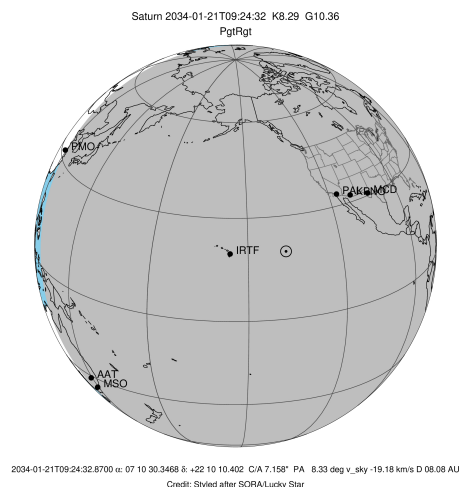
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2034-01-21T07:27:12.179		75.05	-77.84	140461.00	-17.89		
A (OER)	I	2034-01-21T07:30:39.832		74.46	-77.97	136774.40	-17.61		
Encke (OEG)	I	2034-01-21T07:33:33.045		73.95	-78.03	133744.89	-17.36		
Encke (IEG)	I	2034-01-21T07:33:51.579		73.89	-78.04	133423.31	-17.34		
A (IER)	I	2034-01-21T07:45:09.230		71.82	-77.95	122050.38	-16.18		
B (OER)	I	2034-01-21T07:49:51.057		70.93	-77.75	117571.16	-15.60		
B (IER)	I	2034-01-21T08:23:22.173		64.24	-74.26	91984.69	-9.06		
Saturn	I	2034-01-21T08:43:25.751		60.07	-71.02	60061.76		-24.44	-29.08
Saturn	E	2034-01-21T09:59:56.733		43.85	-56.00	59584.84		-49.23	-54.62
B (IER)	E	2034-01-21T09:19:27.589	b	52.47	-64.25	91984.69	9.00		
B (OER)	E	2034-01-21T09:53:16.846	b	45.27	-57.39	117571.16	15.43		
A (IER)	E	2034-01-21T09:58:01.786	b	44.25	-56.40	122050.38	16.00		
Encke (IEG)	E	2034-01-21T10:09:27.341		41.82	-54.02	133423.31	17.13		
Encke (OEG)	E	2034-01-21T10:09:46.100		41.75	-53.95	133744.89	17.16		
A (OER)	E	2034-01-21T10:12:41.445		41.13	-53.34	136774.40	17.40		
F ring	E	2034-01-21T10:16:11.718		40.38	-52.61	140461.00	17.66		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2034-01-21T09:21:27.820
 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 : 3367394105417878272
 2Mass ID (if available) : 07103042+2210114
 ICRS Star Coord at Epoch: 07h 10m 30.34679s +22:10:10.40158s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.294
 G magnitude : 10.363
 RP magnitude : 9.684
 BP magnitude : 10.897
 DUPflag : 0
 Distance (au) : 8.077
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.18
 Sun-Target sep (deg) : 165.36
 Sun-Moon sep (deg) : 152.64
 B (ring opening deg) : -24.57
 PA of pole (deg) : -6.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.774
 C/A sky separation (km) : 39683.9
 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



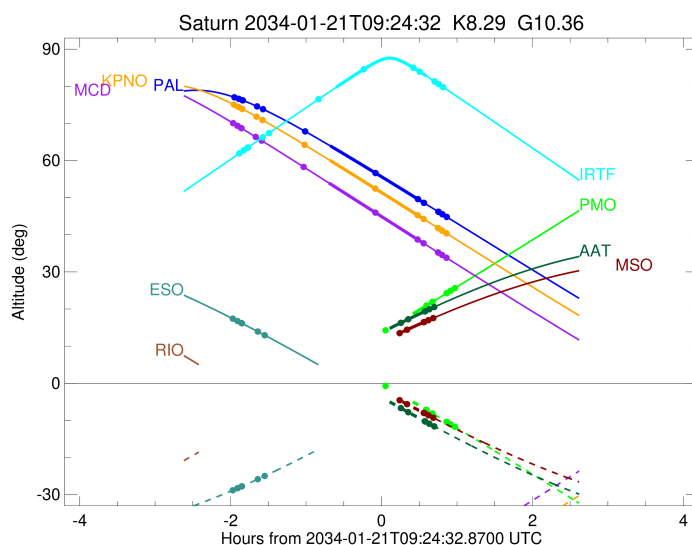
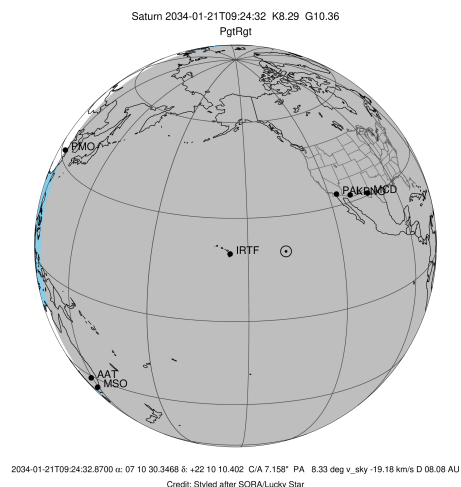
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2034-01-21T07:26:34.692		70.06	-78.50	140461.00	-17.90		
A (OER)	I	2034-01-21T07:30:02.256		69.35	-78.18	136774.40	-17.62		
Encke (OEG)	I	2034-01-21T07:32:55.375		68.76	-77.89	133744.89	-17.37		
Encke (IEG)	I	2034-01-21T07:33:13.898		68.70	-77.85	133423.31	-17.35		
A (IER)	I	2034-01-21T07:44:30.945		66.36	-76.44	122050.38	-16.20		
B (OER)	I	2034-01-21T07:49:12.375		65.38	-75.76	117571.16	-15.62		
B (IER)	I	2034-01-21T08:22:33.249		58.29	-69.96	91984.69	-9.17		
Saturn	I	2034-01-21T08:42:48.785		53.94	-65.98	60063.76		-24.31	-28.94
Saturn	E	2034-01-21T09:59:40.637		37.35	-49.83	59588.07		-49.07	-54.47
B (IER)	E	2034-01-21T09:19:34.545	b	46.00	-58.37	91984.69	9.12		
B (OER)	E	2034-01-21T09:53:14.699	b	38.74	-51.21	117571.16	15.44		
A (IER)	E	2034-01-21T09:57:59.456	b	37.72	-50.19	122050.38	16.01		
Encke (IEG)	E	2034-01-21T10:09:24.989		35.26	-47.74	133423.31	17.12		
Encke (OEG)	E	2034-01-21T10:09:43.754		35.19	-47.67	133744.89	17.15		
A (OER)	E	2034-01-21T10:12:39.170		34.57	-47.04	136774.40	17.39		
F ring	E	2034-01-21T10:16:09.559		33.82	-46.29	140461.00	17.65		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2034-01-21T09:24:46.160
 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 : 3367394105417878272
 2Mass ID (if available) : 07103042+2210114
 ICRS Star Coord at Epoch: 07h 10m 30.34679s +22:10:10.40158s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.294
 G magnitude : 10.363
 RP magnitude : 9.684
 BP magnitude : 10.897
 DUPflag : 0
 Distance (au) : 8.077
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.18
 Sun-Target sep (deg) : 165.36
 Sun-Moon sep (deg) : 153.27
 B (ring opening deg) : -24.57
 PA of pole (deg) : -6.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.206
 C/A sky separation (km) : 42210.5
 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



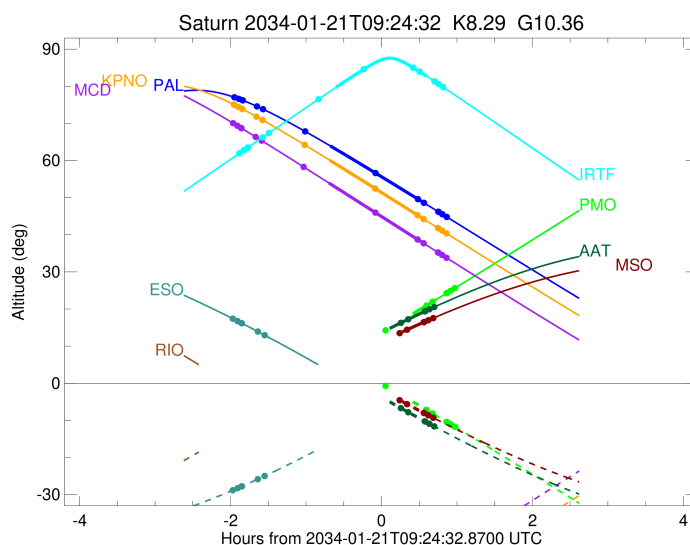
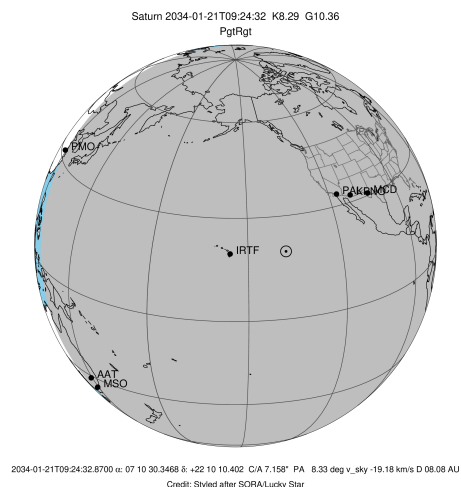
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2034-01-21T07:31:27.938		61.92	-47.41	140461.00	-17.40		
A (OER)	I	2034-01-21T07:35:01.757		62.75	-48.24	136774.40	-17.08		
Encke (OEG)	I	2034-01-21T07:38:00.603		63.44	-48.93	133744.89	-16.79		
Encke (IEG)	I	2034-01-21T07:38:19.769		63.52	-49.01	133423.31	-16.76		
A (IER)	I	2034-01-21T07:50:05.349		66.25	-51.75	122050.38	-15.41		
B (OER)	I	2034-01-21T07:55:02.417		67.40	-52.91	117571.17	-14.73		
B (IER)	I	2034-01-21T08:34:16.193		76.48	-62.08	91984.69	-5.94		
Saturn	I	2034-01-21T08:48:28.904		79.74	-65.41	60019.67		-27.01	-31.94
Saturn	E	2034-01-21T10:00:28.847		82.71	-82.32	59532.80		-51.83	-57.06
B (IER)	E	2034-01-21T09:10:24.451	b	84.59	-70.56	91984.69	5.93		
B (OER)	E	2034-01-21T09:49:47.510	b	85.00	-79.81	117571.16	14.65		
A (IER)	E	2034-01-21T09:54:46.181	b	83.95	-80.98	122050.38	15.33		
Encke (IEG)	E	2034-01-21T10:06:35.548		81.34	-83.76	133423.31	16.67		
Encke (OEG)	E	2034-01-21T10:06:54.816		81.27	-83.83	133744.89	16.71		
A (OER)	E	2034-01-21T10:09:54.622		80.60	-84.54	136774.40	16.99		
F ring	E	2034-01-21T10:13:29.593		79.78	-85.38	140461.00	17.30		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2034-01-21T09:19:42.950
 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 : 3367394105417878272
 2Mass ID (if available) : 07103042+2210114
 ICRS Star Coord at Epoch: 07h 10m 30.34679s +22:10:10.40158s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.294
 G magnitude : 10.363
 RP magnitude : 9.684
 BP magnitude : 10.897
 DUPflag : 0
 Distance (au) : 8.077
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.18
 Sun-Target sep (deg) : 165.36
 Sun-Moon sep (deg) : 151.95
 B (ring opening deg) : -24.57
 PA of pole (deg) : -6.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.552
 C/A sky separation (km) : 44239.1
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2034-01-21T07:26:16.349		17.41	-28.82	140461.00	-16.50		
A (OER)	I	2034-01-21T07:30:02.206		16.76	-28.28	136774.40	-16.14		
Encke (OEG)	I	2034-01-21T07:33:11.868		16.21	-27.81	133744.89	-15.81		
Encke (IEG)	I	2034-01-21T07:33:32.237		16.15	-27.76	133423.31	-15.77		
A (IER)	I	2034-01-21T07:46:09.553		13.93	-25.84	122050.38	-14.20		
B (OER)	I	2034-01-21T07:51:34.137		12.96	-24.99	117571.17	-13.39		
Saturn	I	2034-01-21T08:44:39.175		3.00x	-15.96	59970.72		-29.82	-35.00
Saturn	E	2034-01-21T09:54:16.755		-11.00x	-2.71x	59495.32		-53.74	-58.83
B (OER)	E	2034-01-21T09:39:50.620	b	-8.03x	-5.56	117571.16	13.24		
A (IER)	E	2034-01-21T09:45:19.061	b	-9.16x	-4.49x	122050.38	14.03		
Encke (IEG)	E	2034-01-21T09:58:06.192		-11.80x	-1.95x	133423.31	15.56		
Encke (OEG)	E	2034-01-21T09:58:26.840		-11.87x	-1.88x	133744.89	15.59		
A (OER)	E	2034-01-21T10:01:39.137		-12.53x	-1.24x	136774.40	15.91		
F ring	E	2034-01-21T10:05:28.223		-13.33x	-0.48x	140461.00	16.27		

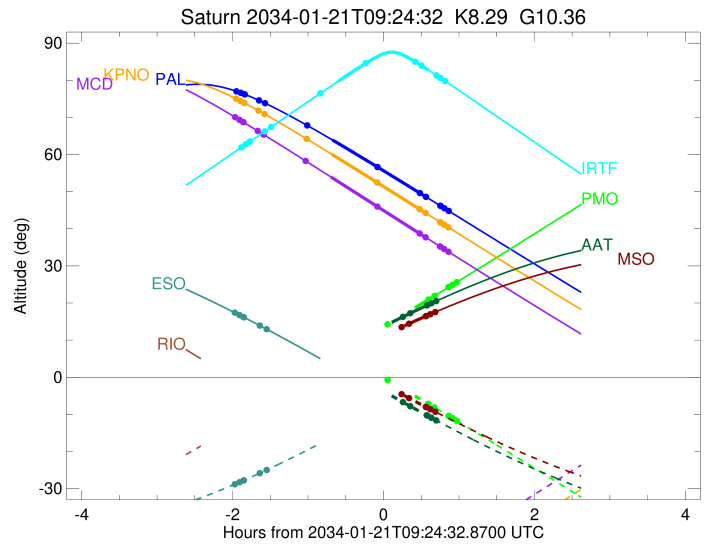
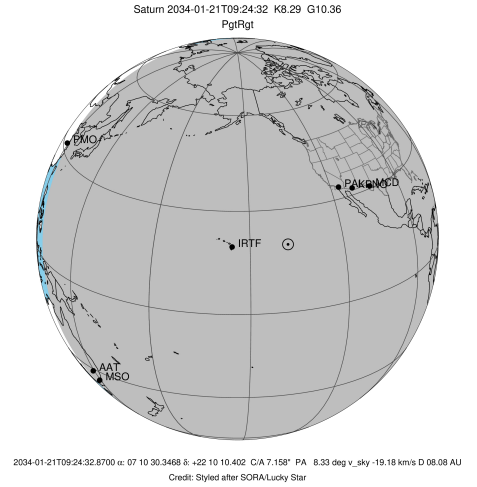
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2034-01-21T09:27:43.280
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 3367394105417878272
 2Mass ID (if available) : 07103042+2210114
 ICRS Star Coord at Epoch: 07h 10m 30.34679s +22:10:10.40158s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.294
 G magnitude : 10.363
 RP magnitude : 9.684
 BP magnitude : 10.897
 DUPflag : 0
 Distance (au) : 8.077
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.18
 Sun-Target sep (deg) : 165.36
 Sun-Moon sep (deg) : 153.36
 B (ring opening deg) : -24.57
 PA of pole (deg) : -6.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.979
 C/A sky separation (km) : 46739.0
 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	2034-01-21T07:35:18.792	-6.80x	18.30x	140461.00	-15.98			
A (OER)	I	2034-01-21T07:39:12.405	-6.02x	17.49x	136774.40	-15.57			
Encke (OEG)	I	2034-01-21T07:42:29.241	-5.37x	16.80x	133744.89	-15.20			
Encke (IEG)	I	2034-01-21T07:42:50.420	-5.30x	16.73x	133423.31	-15.16			
A (IER)	I	2034-01-21T07:56:05.357	-2.69x	13.98x	122050.38	-13.37			
B (OER)	I	2034-01-21T08:01:52.431	-1.56x	12.79x	117571.16	-12.42			
Saturn	I	2034-01-21T08:55:28.303	8.53	1.93x	59923.22	-32.40		-37.76	
Saturn	E	2034-01-21T09:59:13.979	19.40	-10.29	59436.81	-56.82		-61.65	
B (OER)	E	2034-01-21T09:39:59.370	b	16.28	-6.70	117571.16	12.45		
A (IER)	E	2034-01-21T09:45:45.556	b	17.23	-7.79	122050.38	13.41		
Encke (IEG)	E	2034-01-21T09:58:57.686	b	19.36	-10.24	133423.31	15.23		
Encke (OEG)	E	2034-01-21T09:59:18.773		19.41	-10.31	133744.89	15.27		
A (OER)	E	2034-01-21T10:02:34.709		19.92	-10.90	136774.40	15.65		
F ring	E	2034-01-21T10:06:27.148		20.52	-11.61	140461.00	16.07		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2034-01-21T09:27:31.140
 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 : 3367394105417878272
 2Mass ID (if available) : 07103042+2210114
 ICRS Star Coord at Epoch: 07h 10m 30.34679s +22:10:10.40158s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.294
 G magnitude : 10.363
 RP magnitude : 9.684
 BP magnitude : 10.897
 DUPflag : 0
 Distance (au) : 8.077
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.18
 Sun-Target sep (deg) : 165.36
 Sun-Moon sep (deg) : 153.31
 B (ring opening deg) : -24.57
 PA of pole (deg) : -6.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.023
 C/A sky separation (km) : 46998.6
 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



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	2034-01-21T07:35:16.326	-8.33x	19.19x	140461.00	-15.89			
A (OER)	I	2034-01-21T07:39:11.369	-7.58x	18.40x	136774.40	-15.47			
Encke (OEG)	I	2034-01-21T07:42:29.530	-6.95x	17.74x	133744.89	-15.10			
Encke (IEG)	I	2034-01-21T07:42:50.859	-6.88x	17.67x	133423.31	-15.06			
A (IER)	I	2034-01-21T07:56:12.759	-4.36x	15.01x	122050.38	-13.23			
B (OER)	I	2034-01-21T08:02:04.016	-3.27x	13.85x	117571.16	-12.26			
Saturn	I	2034-01-21T08:55:32.598	6.33	3.47x	59916.34	-32.76		-32.76	-38.15
Saturn	E	2034-01-21T09:58:45.435	16.53	-8.08	59431.97	-57.08		-57.08	-61.88
B (OER)	E	2034-01-21T09:38:59.047	b	13.51	-4.57x	117571.16	12.28		
A (IER)	E	2034-01-21T09:44:49.487	b	14.42	-5.62	122050.38	13.26		
Encke (IEG)	E	2034-01-21T09:58:08.791	b	16.44	-7.98	133423.31	15.12		
Encke (OEG)	E	2034-01-21T09:58:30.035	b	16.49	-8.04	133744.89	15.16		
A (OER)	E	2034-01-21T10:01:47.356		16.98	-8.61	136774.40	15.54		
F ring	E	2034-01-21T10:05:41.300		17.55	-9.29	140461.00	15.97		