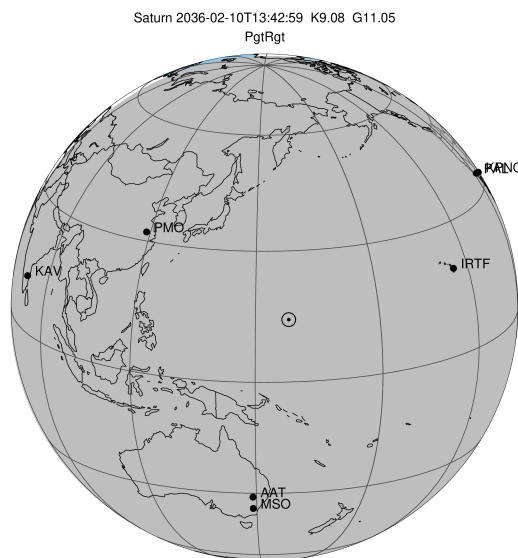


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-02-10T13:42:59.570
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 635033493357566592
 2Mass ID (if available) : 09103334+1722334

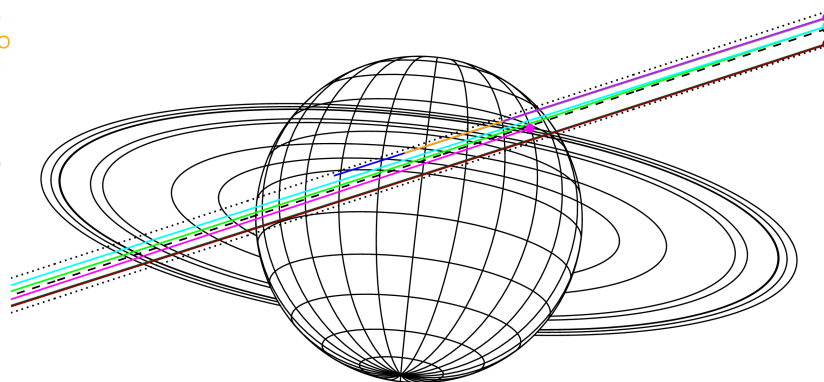
Saturn 2036-02-10T13:42:59 K9.08 G11.05 PgtRgt

ICRS Star Coord at Epoch: 09h 10m 33.32856s +17:22:31.97404s

RUWE (>1.4 is poor) : 1.21
 K magnitude : 9.081
 G magnitude : 11.049
 RP magnitude : 10.424
 BP magnitude : 11.509
 DUPflag : 0
 Distance (au) : 8.165
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.99
 Sun-Target sep (deg) : 173.87
 Sun-Moon sep (deg) : 13.36
 B (ring opening deg) : -16.47
 PA of pole (deg) : -6.73



Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 AAT
 MSO

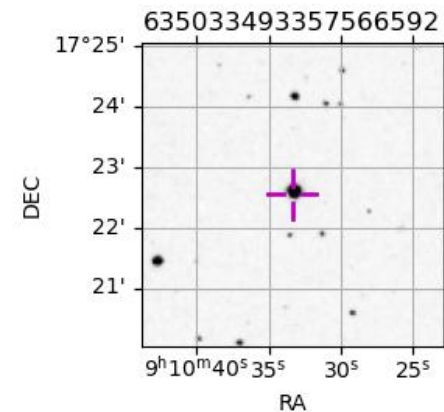


2036-02-10T13:42:59.5700 α: 09 10 33.3286 δ: +17 22 31.974 C/A 3.400° PA 198.11 deg v_sky -19.99 km/s D 08.16 AU
 Credit: Styled after SORA/Lucky Star

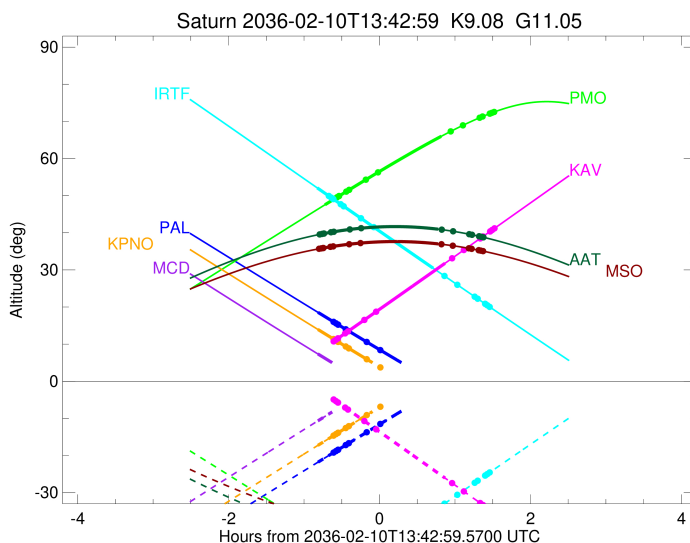
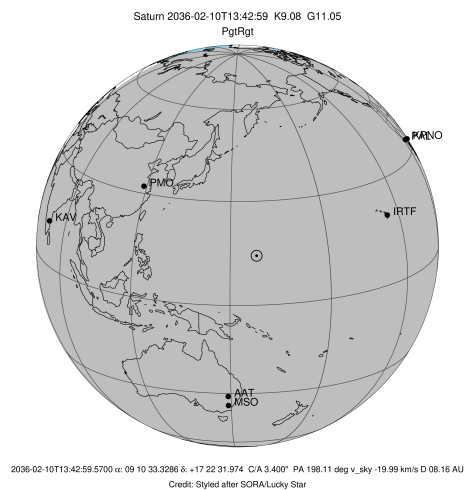
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (20	33.4	243.1		+		FEB 10 12:54 - FEB 10 12:54	PinRnn
PMO	Purple Mtn Obs	32.1	118.8		+	+	FEB 10 12:59 - FEB 10 15:14	PieRne
KPNO	Kitt Peak Natl	32.0	248.4		+		FEB 10 12:53 - FEB 10 12:53	PinRnn
MCD	McDonald Obs.	30.7	256.0		+		FEB 10 12:53 - FEB 10 12:53	PinRnn
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5		+	+	FEB 10 12:53 - FEB 10 15:10	PieRne
KAV	Kavalur Observ	12.6	78.8		+	+	FEB 10 14:35 - FEB 10 15:14	PneRne
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1		+	+	FEB 10 12:54 - FEB 10 15:05	PieRne
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0		+	+	FEB 10 12:54 - FEB 10 15:05	PieRne



target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-02-10T13:39:31.500
 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 : 635033493357566592
 2Mass ID (if available) : 09103334+1722334
 ICRS Star Coord at Epoch: 09h 10m 33.32856s +17:22:31.97404s
 RUWE (>1.4 is poor) : 1.21
 K magnitude : 9.081
 G magnitude : 11.049
 RP magnitude : 10.424
 BP magnitude : 11.509
 DUPflag : 0
 Distance (au) : 8.165
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.99
 Sun-Target sep (deg) : 173.87
 Sun-Moon sep (deg) : 14.20
 B (ring opening deg) : -16.47
 PA of pole (deg) : -6.73
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.219
 C/A sky separation (km) : 24980.8
 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

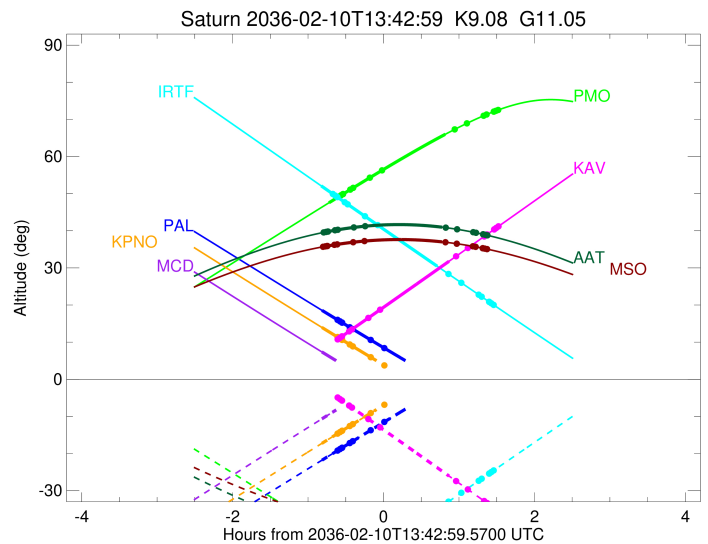
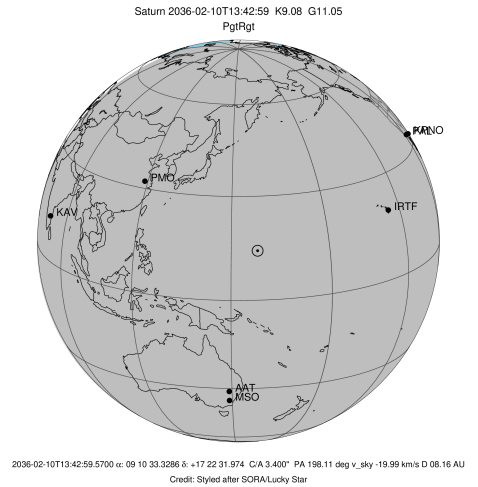


b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2036-02-10T13:06:35.163	b	15.98	-19.18	140461.00	-32.01		
A (OER)	I	2036-02-10T13:08:30.594	b	15.58	-18.78	136774.40	-31.87		
Encke (OEG)	I	2036-02-10T13:10:05.852	b	15.25	-18.45	133744.89	-31.74		
Encke (IEG)	I	2036-02-10T13:10:15.986	b	15.22	-18.42	133423.31	-31.73		
A (IER)	I	2036-02-10T13:16:17.552	b	13.98	-17.16	122050.38	-31.16		
B (OER)	I	2036-02-10T13:18:41.907	b	13.48	-16.66	117571.16	-30.89		
B (IER)	I	2036-02-10T13:32:59.337	b	10.56	-13.69	91984.69	-28.52		
C (IER)	I	2036-02-10T13:43:48.271	b	8.36	-11.46	74490.58	-25.04		
Saturn	I	2036-02-10T12:54:01.160		18.58	-21.81	60008.31		46.41	51.93
Saturn	E	2036-02-10T14:25:26.640		0.05x	-2.95x	60268.00		-0.03	-0.04
C (IER)	E	2036-02-10T14:36:14.069		-2.06x	-0.78x	74490.58	24.94		
B (IER)	E	2036-02-10T14:47:04.167		-4.15x	1.39x	91984.69	28.50		
B (OER)	E	2036-02-10T15:01:21.969		-6.88x	4.21x	117571.17	30.86		
A (IER)	E	2036-02-10T15:03:46.490		-7.33x	4.69x	122050.38	31.12		
Encke (IEG)	E	2036-02-10T15:09:48.725		-8.46x	5.87x	133423.31	31.65		
Encke (OEG)	E	2036-02-10T15:09:58.883		-8.49x	5.90x	133744.89	31.66		
A (OER)	E	2036-02-10T15:11:34.384		-8.79x	6.21x	136774.40	31.78		
F ring	E	2036-02-10T15:13:30.143		-9.15x	6.58x	140461.00	31.91		

```

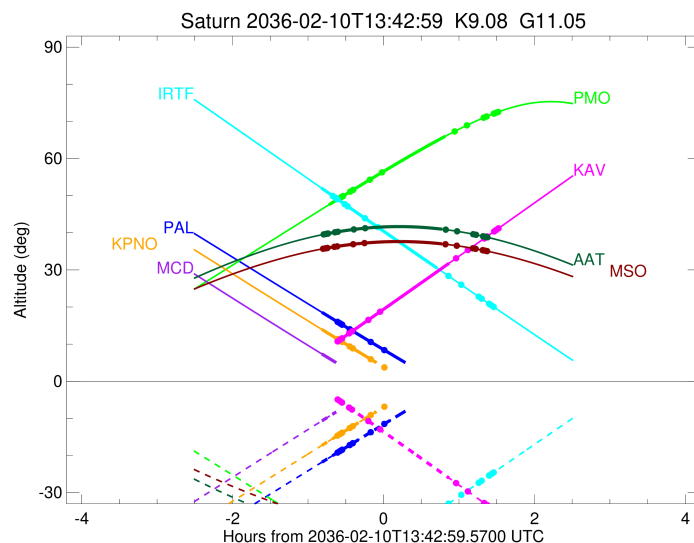
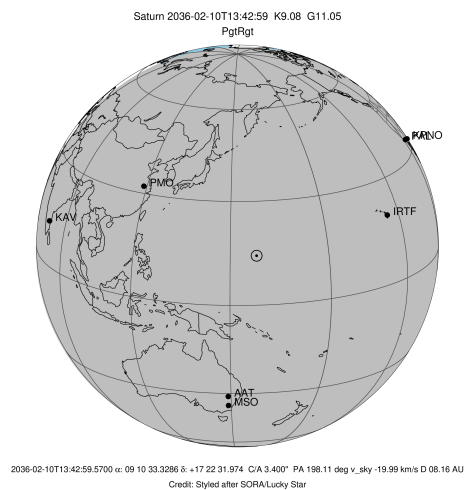
target                : Saturn
target radius (km)   : 60268.00
C/A epoch            : 2036-02-10T13:45:45.180
Event type           : PgtRgt
: Saturn occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : PMO
Location              : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)   : 118.82089
Altitude (km)        : 0.364
Gaia source ID       : 635033493357566592
2Mass ID (if available) : 09103334+1722334
ICRS Star Coord at Epoch: 09h 10m 33.32856s +17:22:31.97404s
RUWE (>1.4 is poor) : 1.21
K magnitude           : 9.081
G magnitude           : 11.049
RP magnitude          : 10.424
BP magnitude          : 11.509
DUPflag              : 0
Distance (au)         : 8.165
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -19.99
Sun-Target sep (deg) : 173.87
Sun-Moon sep (deg)   : 13.07
B (ring opening deg) : -16.47
PA of pole (deg)     : -6.73
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 3.547
C/A sky separation (km) : 21002.6
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

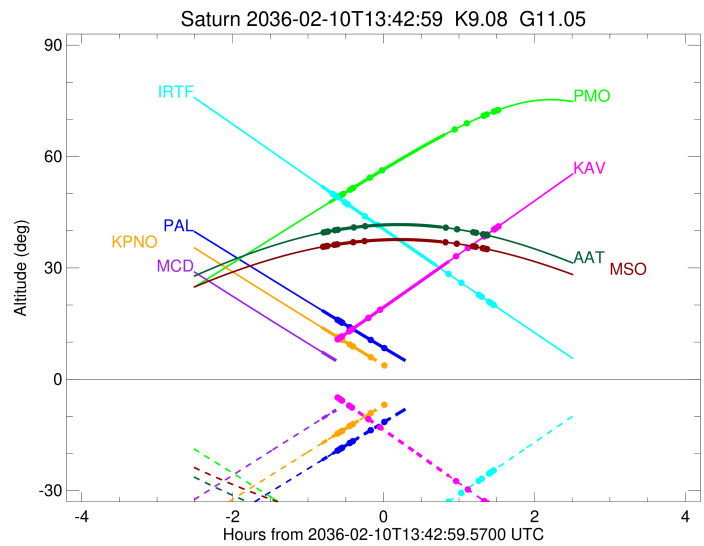
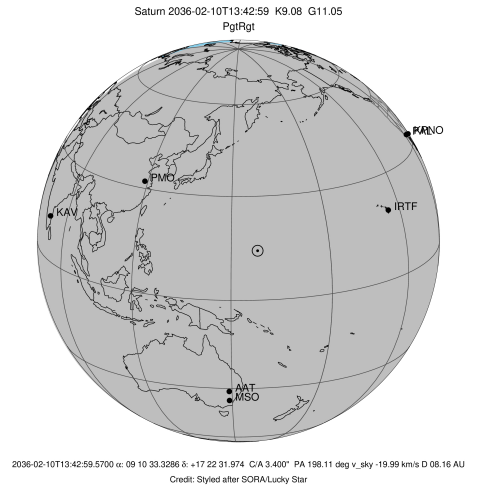
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2036-02-10T13:07:27.303	b	49.19	-43.09	140461.00	-33.50		
A (OER)	I	2036-02-10T13:09:17.519	b	49.57	-43.47	136774.40	-33.40		
Encke (OEG)	I	2036-02-10T13:10:48.345	b	49.89	-43.79	133744.89	-33.31		
Encke (IEG)	I	2036-02-10T13:10:58.000	b	49.92	-43.82	133423.31	-33.30		
A (IER)	I	2036-02-10T13:16:41.490	b	51.11	-45.01	122050.38	-32.90		
B (OER)	I	2036-02-10T13:18:58.017	b	51.59	-45.48	117571.16	-32.71		
B (IER)	I	2036-02-10T13:32:18.411	b	54.34	-48.23	91984.69	-31.04		
C (IER)	I	2036-02-10T13:42:01.566	b	56.32	-50.22	74490.58	-28.71		
Saturn	I	2036-02-10T12:59:35.801		47.54	-41.45	60038.67		42.87	48.48
Saturn	E	2036-02-10T14:32:02.034		65.98	-59.98	60265.51		-4.06	-4.98
C (IER)	E	2036-02-10T14:39:33.455		67.30	-61.35	74490.58	28.77		
B (IER)	E	2036-02-10T14:49:15.285		68.93	-63.06	91984.69	31.12		
B (OER)	E	2036-02-10T15:02:34.289		70.98	-65.28	117571.16	32.73		
A (IER)	E	2036-02-10T15:04:50.762		71.31	-65.64	122050.38	32.91		
Encke (IEG)	E	2036-02-10T15:10:34.345		72.08	-66.53	133423.31	33.28		
Encke (OEG)	E	2036-02-10T15:10:44.007		72.10	-66.55	133744.88	33.29		
A (OER)	E	2036-02-10T15:12:14.910		72.30	-66.78	136774.40	33.37		
F ring	E	2036-02-10T15:14:05.241		72.53	-67.05	140461.00	33.46		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-02-10T13:39:29.620
 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 : 635033493357566592
 2Mass ID (if available) : 09103334+1722334
 ICRS Star Coord at Epoch: 09h 10m 33.32856s +17:22:31.97404s
 RUWE (>1.4 is poor) : 1.21
 K magnitude : 9.081
 G magnitude : 11.049
 RP magnitude : 10.424
 BP magnitude : 11.509
 DUPflag : 0
 Distance (au) : 8.165
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.99
 Sun-Target sep (deg) : 173.87
 Sun-Moon sep (deg) : 14.19
 B (ring opening deg) : -16.47
 PA of pole (deg) : -6.73
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.225
 C/A sky separation (km) : 25021.3
 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	2036-02-10T13:06:34.858	b	11.35	-14.62	140461.00	-31.97		
A (OER)	I	2036-02-10T13:08:30.440	b	10.95	-14.21	136774.40	-31.82		
Encke (OEG)	I	2036-02-10T13:10:05.823	b	10.62	-13.88	133744.89	-31.70		
Encke (IEG)	I	2036-02-10T13:10:15.970	b	10.58	-13.84	133423.31	-31.68		
A (IER)	I	2036-02-10T13:16:18.009	b	9.34	-12.57	122050.38	-31.12		
B (OER)	I	2036-02-10T13:18:42.556	b	8.84	-12.07	117571.16	-30.85		
B (IER)	I	2036-02-10T13:33:01.156	b	5.91	-9.08	91984.69	-28.48		
C (IER)	I	2036-02-10T13:43:51.102	b	3.70x	-6.82	74490.58	-25.00		
Saturn	I	2036-02-10T12:53:55.446		13.98	-17.28	60007.78		46.47	51.99
Saturn	E	2036-02-10T14:25:28.723		-4.59x	1.71x	60268.00		-0.02	-0.02
C (IER)	E	2036-02-10T14:36:17.536		-6.69x	3.88x	74490.58	24.90		
B (IER)	E	2036-02-10T14:47:08.502		-8.77x	6.05x	91984.69	28.47		
B (OER)	E	2036-02-10T15:01:27.177		-11.47x	8.87x	117571.16	30.84		
A (IER)	E	2036-02-10T15:03:51.826		-11.92x	9.34x	122050.38	31.09		
Encke (IEG)	E	2036-02-10T15:09:54.366		-13.04x	10.51x	133423.31	31.62		
Encke (OEG)	E	2036-02-10T15:10:04.533		-13.07x	10.55x	133744.89	31.64		
A (OER)	E	2036-02-10T15:11:40.110		-13.37x	10.86x	136774.40	31.76		
F ring	E	2036-02-10T15:13:35.961		-13.72x	11.23x	140461.00	31.89		

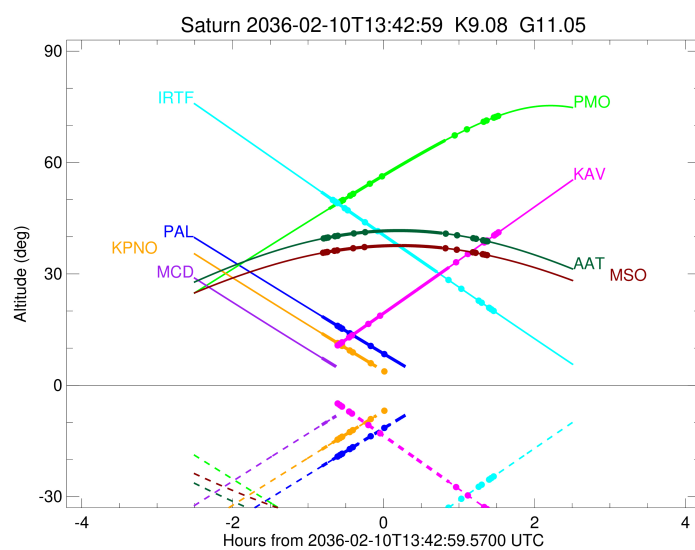
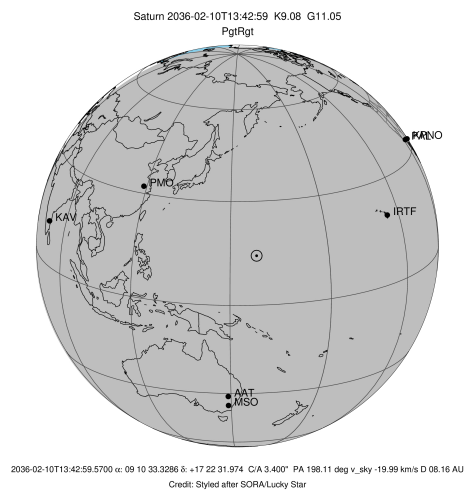
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-02-10T13:39:34.210
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 635033493357566592
 2Mass ID (if available) : 09103334+1722334
 ICRS Star Coord at Epoch: 09h 10m 33.32856s +17:22:31.97404s
 RUWE (>1.4 is poor) : 1.21
 K magnitude : 9.081
 G magnitude : 11.049
 RP magnitude : 10.424
 BP magnitude : 11.509
 DUPflag : 0
 Distance (au) : 8.165
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.99
 Sun-Target sep (deg) : 173.87
 Sun-Moon sep (deg) : 14.15
 B (ring opening deg) : -16.47
 PA of pole (deg) : -6.73
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.239
 C/A sky separation (km) : 25101.1
 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	2036-02-10T13:06:44.127	b	4.72x	-7.97	140461.00	-31.91		
A (OER)	I	2036-02-10T13:08:39.917	b	4.32x	-7.57	136774.40	-31.77		
Encke (OEG)	I	2036-02-10T13:10:15.472	b	4.00x	-7.23	133744.89	-31.64		
Encke (IEG)	I	2036-02-10T13:10:25.638	b	3.96x	-7.20	133423.31	-31.63		
A (IER)	I	2036-02-10T13:16:28.337	b	2.72x	-5.93	122050.38	-31.06		
B (OER)	I	2036-02-10T13:18:53.151	b	2.22x	-5.42	117571.17	-30.79		
B (IER)	I	2036-02-10T13:33:13.438	b	-0.69x	-2.43x	91984.69	-28.41		
C (IER)	I	2036-02-10T13:44:04.956	b	-2.88x	-0.18x	74490.58	-24.93		
Saturn	I	2036-02-10T12:53:54.905		7.38	-10.68	60006.77		46.59	52.10
Saturn	E	2036-02-10T14:25:38.380		-11.03x	8.27x	60268.00		0.01	0.01
C (IER)	E	2036-02-10T14:36:29.664		-13.09x	10.43x	74490.58	24.84		
B (IER)	E	2036-02-10T14:47:21.964		-15.12x	12.56x	91984.69	28.42		
B (OER)	E	2036-02-10T15:01:41.818		-17.74x	15.33x	117571.16	30.80		
A (IER)	E	2036-02-10T15:04:06.630		-18.17x	15.79x	122050.38	31.06		
Encke (IEG)	E	2036-02-10T15:10:09.543		-19.25x	16.94x	133423.31	31.59		
Encke (OEG)	E	2036-02-10T15:10:19.719		-19.28x	16.97x	133744.89	31.61		
A (OER)	E	2036-02-10T15:11:55.388		-19.57x	17.27x	136774.40	31.73		
F ring	E	2036-02-10T15:13:51.344		-19.91x	17.64x	140461.00	31.86		

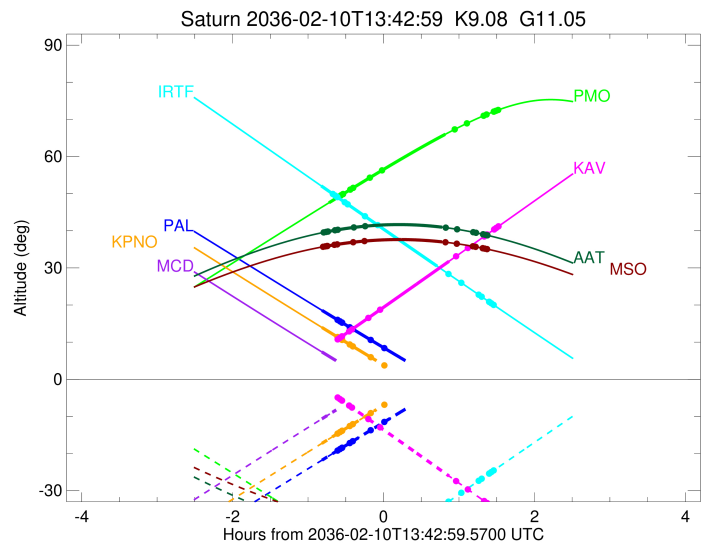
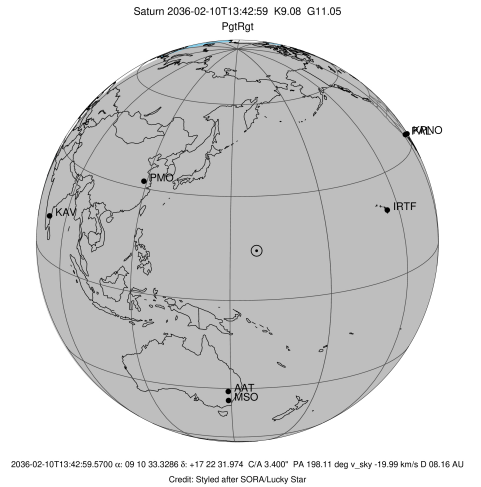
```

target                : Saturn
target radius (km)   : 60268.00
C/A epoch            : 2036-02-10T13:39:21.020
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       : 635033493357566592
2Mass ID (if available) : 09103334+1722334
ICRS Star Coord at Epoch: 09h 10m 33.32856s +17:22:31.97404s
RUWE (>1.4 is poor) : 1.21
K magnitude           : 9.081
G magnitude           : 11.049
RP magnitude          : 10.424
BP magnitude          : 11.509
DUPflag              : 0
Distance (au)        : 8.165
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -19.99
Sun-Target sep (deg) : 173.87
Sun-Moon sep (deg)   : 14.25
B (ring opening deg) : -16.47
PA of pole (deg)     : -6.73
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 3.802
C/A sky separation (km) : 22514.0
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	2036-02-10T13:02:50.199	b	49.89	-54.57	140461.00	-32.75		
A (OER)	I	2036-02-10T13:04:42.955	b	49.45	-54.13	136774.40	-32.63		
Encke (OEG)	I	2036-02-10T13:06:15.934	b	49.08	-53.77	133744.89	-32.53		
Encke (IEG)	I	2036-02-10T13:06:25.822	b	49.04	-53.73	133423.31	-32.52		
A (IER)	I	2036-02-10T13:12:18.024	b	47.66	-52.35	122050.38	-32.04		
B (OER)	I	2036-02-10T13:14:38.290	b	47.11	-51.80	117571.16	-31.82		
B (IER)	I	2036-02-10T13:28:25.091	b	43.87	-48.55	91984.69	-29.86		
C (IER)	I	2036-02-10T13:38:36.413	b	41.48	-46.16	74490.58	-27.10		
Saturn	I	2036-02-10T12:53:32.855		52.08	-56.76	60029.91		43.90	49.48
Saturn	E	2036-02-10T14:25:31.840		30.49	-35.12	60267.23		-2.26	-2.78
C (IER)	E	2036-02-10T14:34:36.594		28.38	-32.99	74490.58	27.03		
B (IER)	E	2036-02-10T14:44:48.931		26.00	-30.60	91984.69	29.81		
B (OER)	E	2036-02-10T14:58:37.902		22.80	-27.36	117571.16	31.69		
A (IER)	E	2036-02-10T15:00:58.795		22.25	-26.81	122050.38	31.89		
Encke (IEG)	E	2036-02-10T15:06:52.946		20.89	-25.43	133423.31	32.32		
Encke (OEG)	E	2036-02-10T15:07:02.895		20.85	-25.39	133744.89	32.33		
A (OER)	E	2036-02-10T15:08:36.478		20.49	-25.03	136774.40	32.42		
F ring	E	2036-02-10T15:10:30.009		20.05	-24.59	140461.00	32.52		

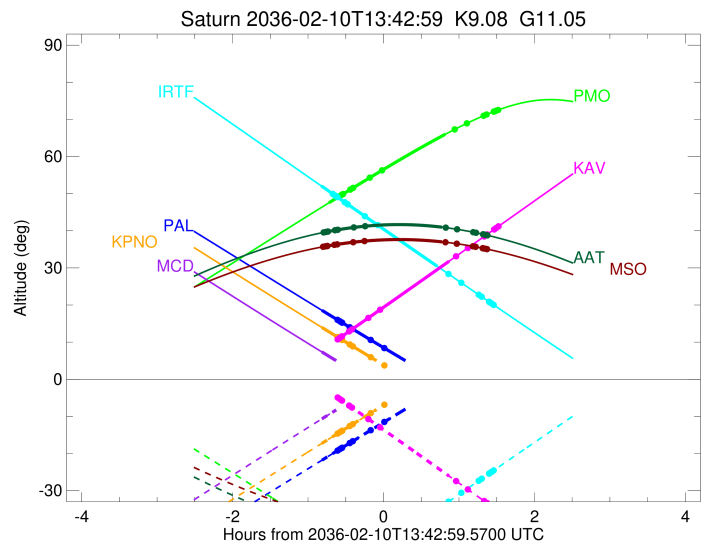
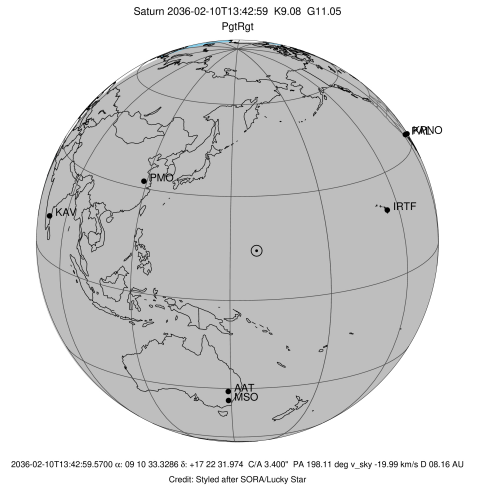
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-02-10T13:47:56.510
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 635033493357566592
 2Mass ID (if available) : 09103334+1722334
 ICRS Star Coord at Epoch: 09h 10m 33.32856s +17:22:31.97403s
 RUWE (>1.4 is poor) : 1.21
 K magnitude : 9.081
 G magnitude : 11.049
 RP magnitude : 10.424
 BP magnitude : 11.509
 DUPflag : 0
 Distance (au) : 8.165
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.99
 Sun-Target sep (deg) : 173.87
 Sun-Moon sep (deg) : 12.49
 B (ring opening deg) : -16.47
 PA of pole (deg) : -6.73
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.209
 C/A sky separation (km) : 19001.2
 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

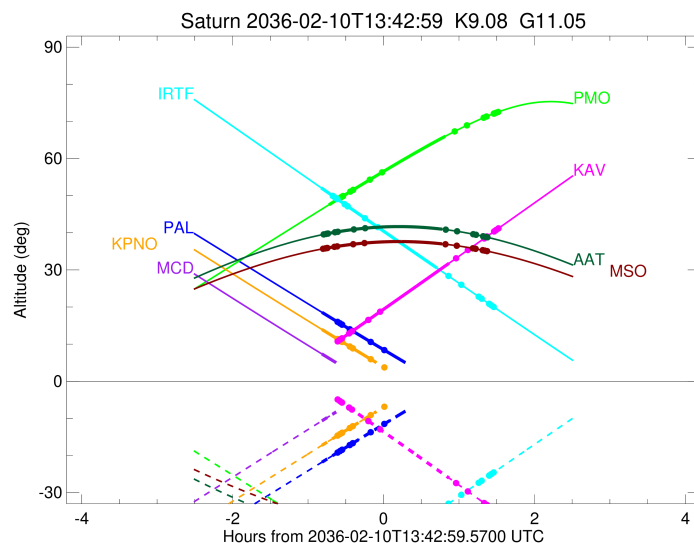
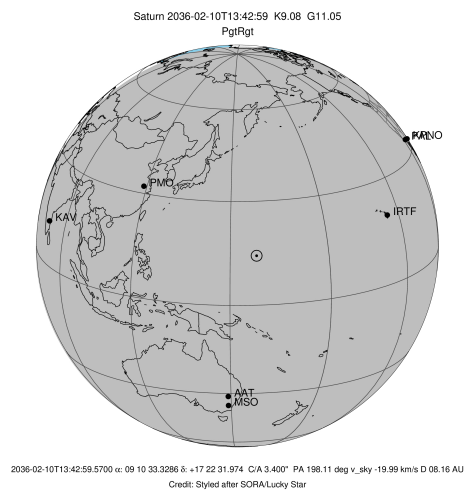
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2036-02-10T13:06:39.417	b	10.77	-4.94x	140461.00	-33.80		
A (OER)	I	2036-02-10T13:08:28.610	b	11.20	-5.38	136774.40	-33.72		
Encke (OEG)	I	2036-02-10T13:09:58.536	b	11.56	-5.73	133744.89	-33.65		
Encke (IEG)	I	2036-02-10T13:10:08.092	b	11.60	-5.77	133423.31	-33.65		
A (IER)	I	2036-02-10T13:15:47.595	b	12.93	-7.11	122050.38	-33.34		
B (OER)	I	2036-02-10T13:18:02.258	b	13.46	-7.65	117571.16	-33.19		
B (IER)	I	2036-02-10T13:31:07.216	b	16.56	-10.76	91984.69	-31.85		
C (IER)	I	2036-02-10T13:40:30.708	b	18.79	-13.00	74490.58	-30.06		
Saturn	I	2036-02-10T13:00:45.810		9.38	-3.55x	60051.96		41.32	46.94
Saturn	E	2036-02-10T14:35:06.965		31.79	-26.08	60261.98		-6.31	-7.74
C (IER)	E	2036-02-10T14:40:39.887		33.12	-27.41	74490.58	30.22		
B (IER)	E	2036-02-10T14:49:59.974		35.35	-29.66	91984.69	32.06		
B (OER)	E	2036-02-10T15:03:00.483		38.46	-32.79	117571.16	33.35		
A (IER)	E	2036-02-10T15:05:14.498		38.99	-33.33	122050.38	33.49		
Encke (IEG)	E	2036-02-10T15:10:52.468		40.34	-34.68	133423.31	33.79		
Encke (OEG)	E	2036-02-10T15:11:01.983		40.38	-34.72	133744.89	33.80		
A (OER)	E	2036-02-10T15:12:31.519		40.74	-35.08	136774.40	33.87		
F ring	E	2036-02-10T15:14:20.246		41.17	-35.52	140461.00	33.94		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-02-10T13:41:55.690
 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 : 635033493357566592
 2Mass ID (if available) : 09103334+1722334
 ICRS Star Coord at Epoch: 09h 10m 33.32856s +17:22:31.97404s
 RUWE (>1.4 is poor) : 1.21
 K magnitude : 9.081
 G magnitude : 11.049
 RP magnitude : 10.424
 BP magnitude : 11.509
 DUPflag : 0
 Distance (au) : 8.165
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.99
 Sun-Target sep (deg) : 173.87
 Sun-Moon sep (deg) : 13.53
 B (ring opening deg) : -16.47
 PA of pole (deg) : -6.73
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.622
 C/A sky separation (km) : 15524.5
 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	2036-02-10T12:55:32.718	b	39.57	-40.41	140461.00	-34.21		
A (OER)	I	2036-02-10T12:57:20.555	b	39.69	-40.58	136774.40	-34.16		
Encke (OEG)	I	2036-02-10T12:58:49.309	b	39.79	-40.72	133744.89	-34.11		
Encke (IEG)	I	2036-02-10T12:58:58.738	b	39.80	-40.73	133423.31	-34.10		
A (IER)	I	2036-02-10T13:04:33.270	b	40.15	-41.23	122050.38	-33.88		
B (OER)	I	2036-02-10T13:06:45.684	b	40.27	-41.42	117571.17	-33.77		
B (IER)	I	2036-02-10T13:19:32.825	b	40.91	-42.42	91984.69	-32.82		
C (IER)	I	2036-02-10T13:28:35.447	b	41.24	-43.01	74490.58	-31.55		
Saturn	I	2036-02-10T12:54:26.246		39.49	-40.30	60083.66		37.57	43.15
Saturn	E	2036-02-10T14:29:34.622		40.97	-44.45	60255.52		-9.11	-11.14
C (IER)	E	2036-02-10T14:32:26.123		40.85	-44.41	74490.58	31.65		
B (IER)	E	2036-02-10T14:41:27.619		40.40	-44.19	91984.69	32.83		
B (OER)	E	2036-02-10T14:54:15.908		39.62	-43.71	117571.17	33.67		
A (IER)	E	2036-02-10T14:56:28.768		39.47	-43.61	122050.38	33.76		
Encke (IEG)	E	2036-02-10T15:02:04.664		39.06	-43.32	133423.31	33.95		
Encke (OEG)	E	2036-02-10T15:02:14.136		39.05	-43.31	133744.89	33.95		
A (OER)	E	2036-02-10T15:03:43.305		38.93	-43.23	136774.40	34.00		
F ring	E	2036-02-10T15:05:31.673		38.79	-43.13	140461.00	34.04		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-02-10T13:41:51.160
 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 : 635033493357566592
 2Mass ID (if available) : 09103334+1722334
 ICRS Star Coord at Epoch: 09h 10m 33.32856s +17:22:31.97404s
 RUWE (>1.4 is poor) : 1.21
 K magnitude : 9.081
 G magnitude : 11.049
 RP magnitude : 10.424
 BP magnitude : 11.509
 DUPflag : 0
 Distance (au) : 8.165
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.99
 Sun-Target sep (deg) : 173.87
 Sun-Moon sep (deg) : 13.53
 B (ring opening deg) : -16.47
 PA of pole (deg) : -6.73
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.576
 C/A sky separation (km) : 15256.4
 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_itr93_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	2036-02-10T12:55:04.018	b	35.70	-36.72	140461.00	-34.23		
A (OER)	I	2036-02-10T12:56:51.805	b	35.81	-36.87	136774.40	-34.18		
Encke (OEG)	I	2036-02-10T12:58:20.512	b	35.90	-37.00	133744.88	-34.13		
Encke (IEG)	I	2036-02-10T12:58:29.936	b	35.91	-37.01	133423.31	-34.12		
A (IER)	I	2036-02-10T13:04:04.245	b	36.22	-37.47	122050.38	-33.91		
B (OER)	I	2036-02-10T13:06:16.547	b	36.34	-37.64	117571.16	-33.80		
B (IER)	I	2036-02-10T13:19:02.637	b	36.92	-38.55	91984.69	-32.88		
C (IER)	I	2036-02-10T13:28:03.871	b	37.23	-39.09	74490.58	-31.66		
Saturn	I	2036-02-10T12:54:15.690		35.65	-36.65	60085.61		37.33	42.91
Saturn	E	2036-02-10T14:29:35.935		37.01	-40.43	60254.78		-9.38	-11.46
C (IER)	E	2036-02-10T14:32:11.248		36.91	-40.40	74490.58	31.77		
B (IER)	E	2036-02-10T14:41:11.290		36.52	-40.21	91984.69	32.90		
B (OER)	E	2036-02-10T14:53:58.436		35.82	-39.79	117571.17	33.70		
A (IER)	E	2036-02-10T14:56:11.159		35.68	-39.70	122050.38	33.79		
Encke (IEG)	E	2036-02-10T15:01:46.764		35.31	-39.44	133423.31	33.98		
Encke (OEG)	E	2036-02-10T15:01:56.228		35.30	-39.43	133744.89	33.98		
A (OER)	E	2036-02-10T15:03:25.331		35.20	-39.36	136774.40	34.02		
F ring	E	2036-02-10T15:05:13.624		35.07	-39.27	140461.00	34.07		