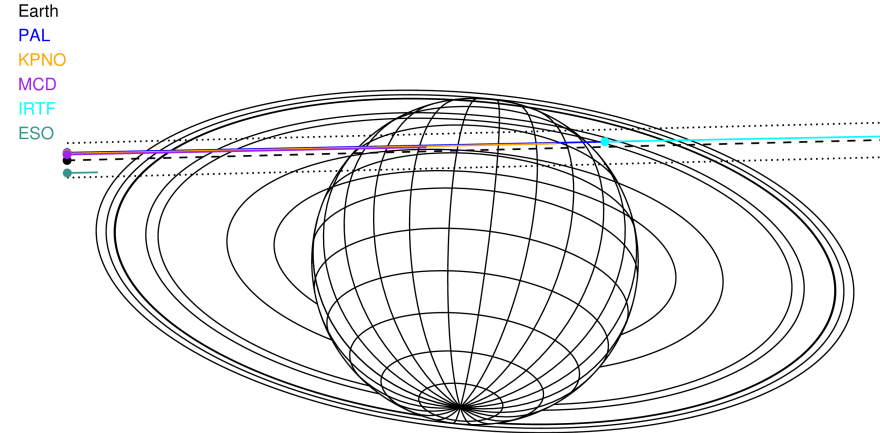


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-08-17T12:16:36.320
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3376976658492394752
 2Mass ID (if available) : 06144669+2224110

Saturn 2032-08-17T12:16:36 K8.46 G14.12 PgtRgt

ICRS Star Coord at Epoch: 06h 14m 46.69182s +22:24:11.09829s

RUWE (>1.4 is poor) : 1.25
 K magnitude : 8.455
 G magnitude : 14.124
 RP magnitude : 12.789
 BP magnitude : 16.225
 DUPflag : 0
 Distance (au) : 9.614
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 28.27
 Sun-Target sep (deg) : 51.29
 Sun-Moon sep (deg) : 176.27
 B (ring opening deg) : -26.20
 PA of pole (deg) : -5.79
 # a(km) ring

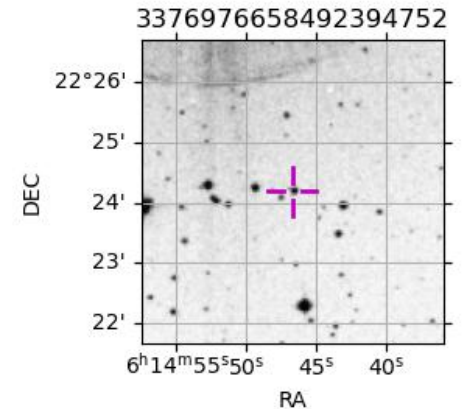


2032-08-17T12:16:36.3200 ex: 06 14 46.6918 s: +22 24 11.098 C/A 5.892° PA 181.44 deg v_sky +28.27 km/s D 09.61 AU
 Credit: Styled after SORA/Lucky Star

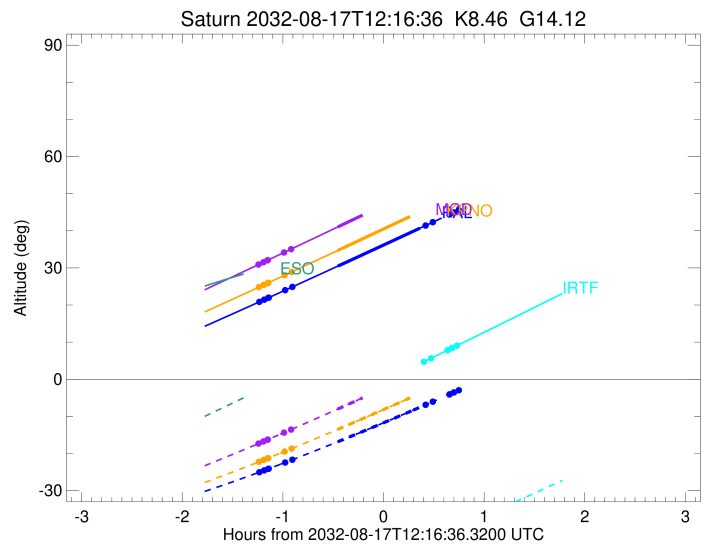
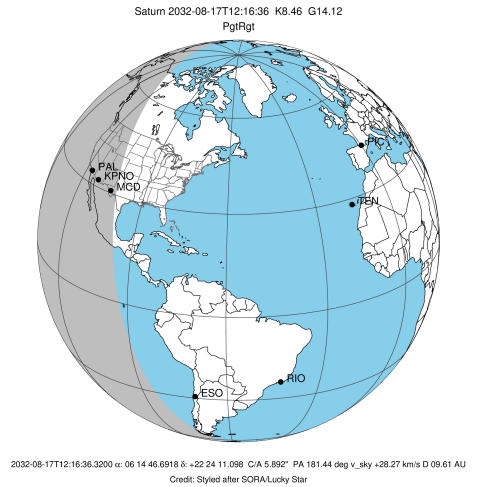
- 1 74490.6 C (IER)
- 2 91984.7 B (IER)
- 3 117571.2 B (OER)
- 4 122050.4 A (IER)
- 5 133423.3 Encke (IEG)
- 6 133744.9 Encke (OEG)
- 7 136774.4 A (OER)
- 8 140461.0 F ring

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	+ + + + +	+ +	+ +	AUG 17 11:02 - AUG 17 12:46	PieRie
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+ + + + +	+		AUG 17 11:02 - AUG 17 11:49	PinRin
MCD	McDonald Obs.	30.7	256.0	+ + + + +	+		AUG 17 11:02 - AUG 17 11:49	PinRin
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5			+ + + + +	AUG 17 12:44 - AUG 17 13:00	PnnRne
KAV	Kavalur Observ	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3					PnnRnn
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

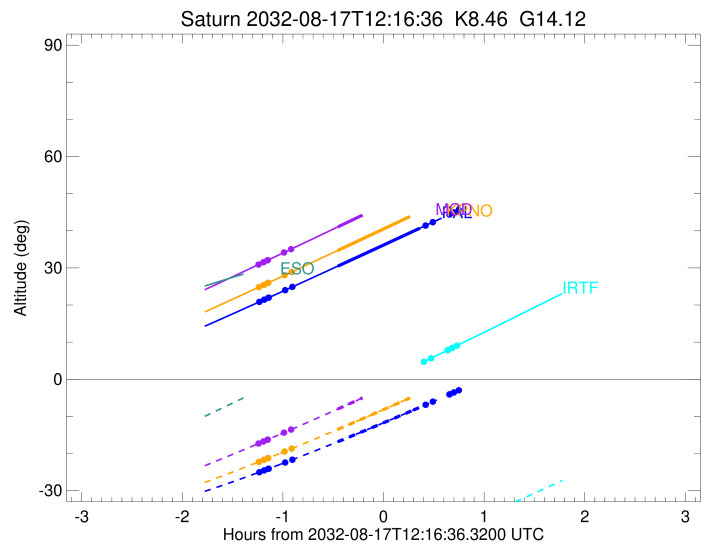
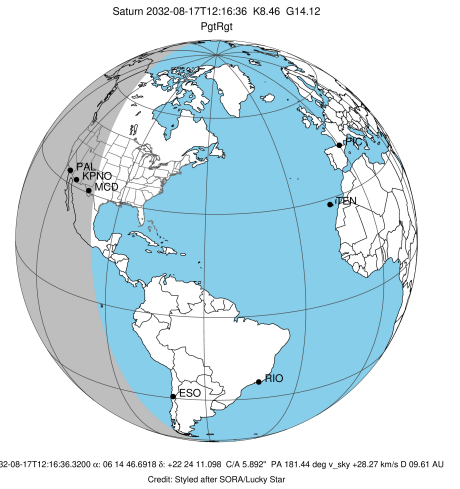


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-08-17T12:13:55.640
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3376976658492394752
 2Mass ID (if available) : 06144669+2224110
 ICRS Star Coord at Epoch: 06h 14m 46.69182s +22:24:11.09829s
 RUWE (>1.4 is poor) : 1.25
 K magnitude : 8.455
 G magnitude : 14.124
 RP magnitude : 12.789
 BP magnitude : 16.225
 DUPflag : 0
 Distance (au) : 9.615
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 28.27
 Sun-Target sep (deg) : 51.29
 Sun-Moon sep (deg) : 176.82
 B (ring opening deg) : -26.20
 PA of pole (deg) : -5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.196
 C/A sky separation (km) : 43204.5
 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	2032-08-17T11:02:29.715		20.83	-25.04	140461.00	-21.40		
A (OER)	I	2032-08-17T11:05:24.047		21.42	-24.56	136774.40	-20.89		
Encke (OEG)	I	2032-08-17T11:07:50.636		21.92	-24.15	133744.89	-20.44		
Encke (IEG)	I	2032-08-17T11:08:06.391		21.98	-24.10	133423.31	-20.39		
A (IER)	I	2032-08-17T11:17:54.297		23.98	-22.43	122050.38	-18.21		
B (OER)	I	2032-08-17T11:22:08.032		24.85	-21.70	117571.16	-17.08		
Saturn	I	2032-08-17T11:49:23.589		30.48	-16.82	59818.05		34.65	40.13
Saturn	E	2032-08-17T12:38:16.014		40.69	-7.55	59549.15		46.14	51.67
B (OER)	E	2032-08-17T12:41:44.452		41.42	-6.87	117571.17	16.97		
A (IER)	E	2032-08-17T12:45:59.812		42.31	-6.04	122050.38	18.09		
Encke (IEG)	E	2032-08-17T12:55:51.569		44.38	-4.09x	133423.31	20.25		
Encke (OEG)	E	2032-08-17T12:56:07.431		44.43	-4.04x	133744.89	20.30		
A (OER)	E	2032-08-17T12:58:35.026		44.95	-3.55x	136774.40	20.75		
F ring	E	2032-08-17T13:01:30.584		45.56	-2.97x	140461.00	21.24		

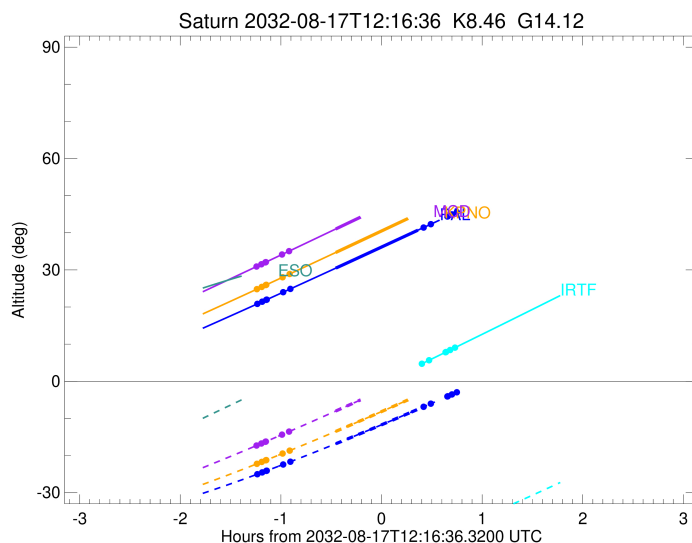
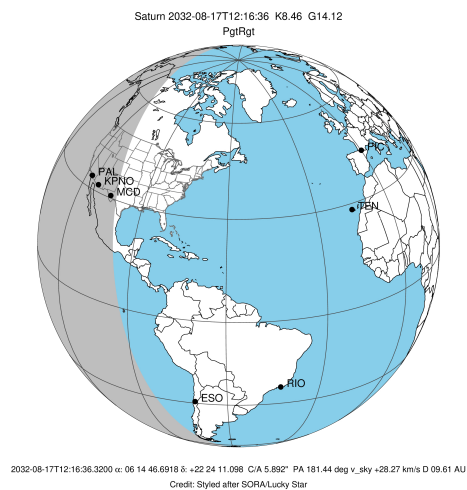
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-08-17T12:14:02.210
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3376976658492394752
 2Mass ID (if available) : 06144669+2224110
 ICRS Star Coord at Epoch: 06h 14m 46.69182s +22:24:11.09829s
 RUWE (>1.4 is poor) : 1.25
 K magnitude : 8.455
 G magnitude : 14.124
 RP magnitude : 12.789
 BP magnitude : 16.225
 DUPflag : 0
 Distance (au) : 9.615
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 28.27
 Sun-Target sep (deg) : 51.29
 Sun-Moon sep (deg) : 176.77
 B (ring opening deg) : -26.20
 PA of pole (deg) : -5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.154
 C/A sky separation (km) : 42912.0
 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	2032-08-17T11:02:14.934		24.80	-22.25	140461.00	-21.49		
A (OER)	I	2032-08-17T11:05:08.411		25.40	-21.73	136774.40	-21.00		
Encke (OEG)	I	2032-08-17T11:07:34.195		25.91	-21.29	133744.89	-20.56		
Encke (IEG)	I	2032-08-17T11:07:49.858		25.97	-21.25	133423.31	-20.51		
A (IER)	I	2032-08-17T11:17:33.404		28.00	-19.48	122050.38	-18.38		
B (OER)	I	2032-08-17T11:21:44.502		28.88	-18.71	117571.16	-17.28		
Saturn	I	2032-08-17T11:49:17.186		34.69	-13.51	59826.04		34.29	39.76
Saturn	E	2032-08-17T12:38:35.592		45.16	-3.77x	59556.50		45.83	51.37
B (OER)	E	2032-08-17T12:42:27.224		45.98	-2.99x	117571.16	17.17		
A (IER)	E	2032-08-17T12:46:39.873		46.88	-2.13x	122050.38	18.27		
Encke (IEG)	E	2032-08-17T12:56:27.098		48.97	-0.14x	133423.31	20.37		
Encke (OEG)	E	2032-08-17T12:56:42.863		49.02	-0.08x	133744.89	20.42		
A (OER)	E	2032-08-17T12:59:09.607		49.54	0.42x	136774.40	20.86		
F ring	E	2032-08-17T13:02:04.255		50.16	1.01x	140461.00	21.35		

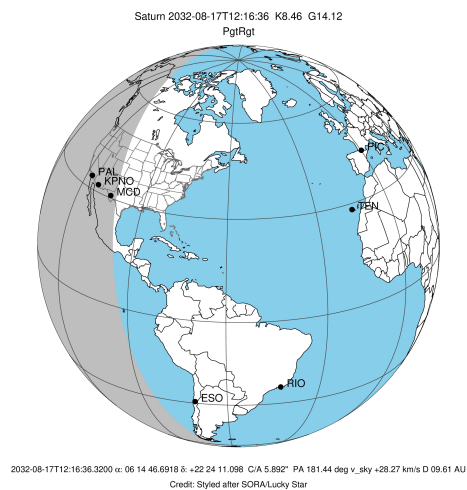
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-08-17T12:14:15.610
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3376976658492394752
 2Mass ID (if available) : 06144669+2224110
 ICRS Star Coord at Epoch: 06h 14m 46.69182s +22:24:11.09829s
 RUWE (>1.4 is poor) : 1.25
 K magnitude : 8.455
 G magnitude : 14.124
 RP magnitude : 12.789
 BP magnitude : 16.225
 DUPflag : 0
 Distance (au) : 9.615
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 28.27
 Sun-Target sep (deg) : 51.29
 Sun-Moon sep (deg) : 176.71
 B (ring opening deg) : -26.20
 PA of pole (deg) : -5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.106
 C/A sky separation (km) : 42574.5
 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



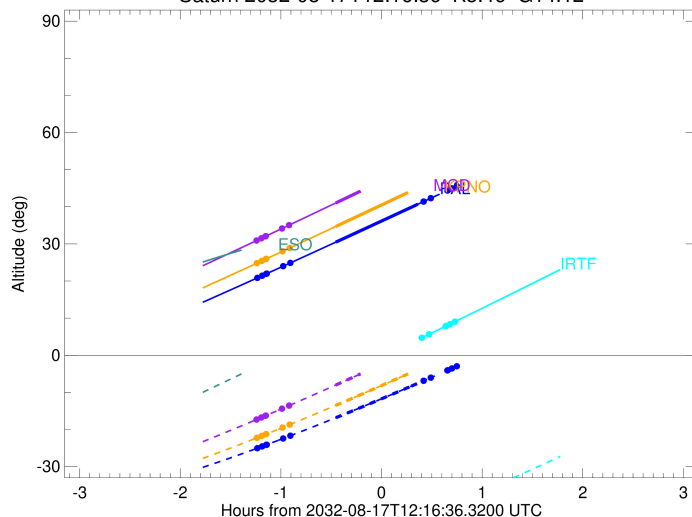
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2032-08-17T11:02:02.044		30.89	-17.32	140461.00	-21.60		
A (OER)	I	2032-08-17T11:04:54.593		31.51	-16.77	136774.40	-21.12		
Encke (OEG)	I	2032-08-17T11:07:19.498		32.02	-16.31	133744.89	-20.69		
Encke (IEG)	I	2032-08-17T11:07:35.061		32.08	-16.26	133423.31	-20.64		
A (IER)	I	2032-08-17T11:17:13.836		34.14	-14.39	122050.38	-18.57		
B (OER)	I	2032-08-17T11:21:22.048		35.02	-13.58	117571.16	-17.50		
Saturn	I	2032-08-17T11:49:15.413		41.01	-8.03	59835.36		33.87	39.32
Saturn	E	2032-08-17T12:39:04.079		51.76	2.21x	59564.74		45.48	51.03
B (OER)	E	2032-08-17T12:43:21.292		52.69	3.11x	117571.16	17.40		
A (IER)	E	2032-08-17T12:47:30.931		53.58	3.98x	122050.38	18.46		
Encke (IEG)	E	2032-08-17T12:57:13.075		55.67	6.02x	133423.31	20.52		
Encke (OEG)	E	2032-08-17T12:57:28.731		55.73	6.08x	133744.89	20.56		
A (OER)	E	2032-08-17T12:59:54.513		56.25	6.59x	136774.40	20.99		
F ring	E	2032-08-17T13:02:48.130		56.88	7.20x	140461.00	21.47		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-08-17T12:13:13.700
 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 : 3376976658492394752
 2Mass ID (if available) : 06144669+2224110
 ICRS Star Coord at Epoch: 06h 14m 46.69182s +22:24:11.09829s
 RUWE (>1.4 is poor) : 1.25
 K magnitude : 8.455
 G magnitude : 14.124
 RP magnitude : 12.789
 BP magnitude : 16.225
 DUPflag : 0
 Distance (au) : 9.615
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 28.27
 Sun-Target sep (deg) : 51.29
 Sun-Moon sep (deg) : 176.83
 B (ring opening deg) : -26.20
 PA of pole (deg) : -5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.211
 C/A sky separation (km) : 43308.0
 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



Saturn 2032-08-17T12:16:36 K8.46 G14.12



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2032-08-17T11:02:37.673		-15.96x	-55.92	140461.00	-21.53		
A (OER)	I	2032-08-17T11:05:30.968		-15.38x	-55.73	136774.40	-21.01		
Encke (OEG)	I	2032-08-17T11:07:56.727		-14.89x	-55.55	133744.89	-20.55		
Encke (IEG)	I	2032-08-17T11:08:12.396		-14.84x	-55.53	133423.31	-20.50		
A (IER)	I	2032-08-17T11:17:57.515		-12.85x	-54.74	122050.38	-18.28		
B (OER)	I	2032-08-17T11:22:10.410		-11.99x	-54.35	117571.16	-17.12		
Saturn	I	2032-08-17T11:48:59.237		-6.40x	-51.31	59813.88		34.83	40.33
Saturn	E	2032-08-17T12:37:17.173		3.98x	-43.91	59548.20		46.18	51.71
B (OER)	E	2032-08-17T12:40:42.019		4.73x	-43.32	117571.16	16.99		
A (IER)	E	2032-08-17T12:44:56.903		5.65	-42.57	122050.38	18.13		
Encke (IEG)	E	2032-08-17T12:54:46.851		7.81	-40.80	133423.31	20.32		
Encke (OEG)	E	2032-08-17T12:55:02.655		7.87	-40.75	133744.89	20.37		
A (OER)	E	2032-08-17T12:57:29.694		8.41	-40.30	136774.40	20.83		
F ring	E	2032-08-17T13:00:24.558		9.06	-39.76	140461.00	21.33		