

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-08-24T04:46:51.290
 Event type : XRT
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 4068973955290849152
 2Mass ID (if available) : 17483900-2228410

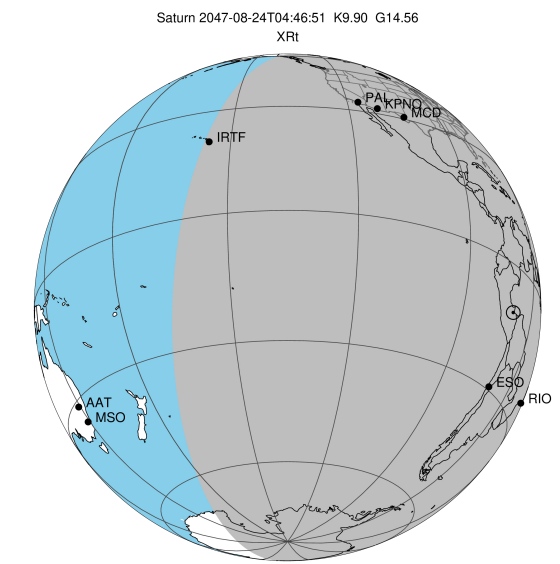
Saturn 2047-08-24T04:46:51 K9.90 G14.56 XRT

ICRS Star Coord at Epoch: 17h 48m 39.00208s -22:28:41.32907s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 9.898
 G magnitude : 14.558
 RP magnitude : 13.356
 BP magnitude : 16.112
 DUPflag : 0
 Distance (au) : 9.546
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -4.05
 Sun-Target sep (deg) : 117.05
 Sun-Moon sep (deg) : 79.69
 B (ring opening deg) : 26.86
 PA of pole (deg) : 5.29

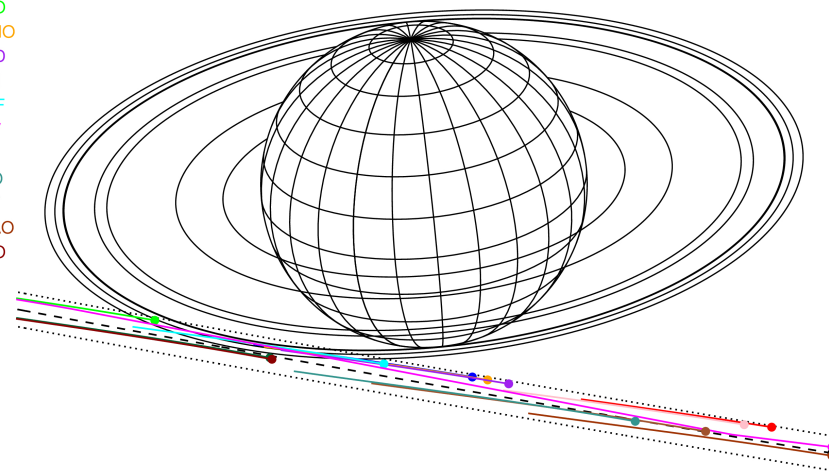
a(km) ring

- 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



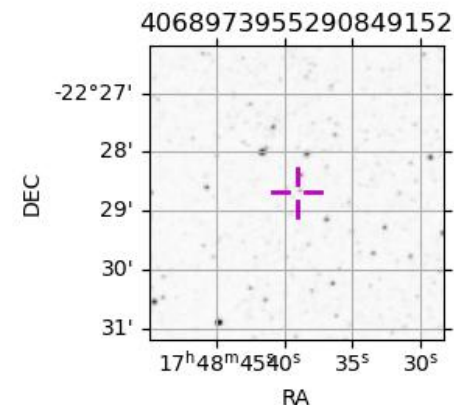
2047-08-24T04:46:51.2900 α: 17 48 39.0021 δ: -22 28 41.329 C/A ***** PA 349.96 deg v_sky - 4.05 km/s D 09.55 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 PMO
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO

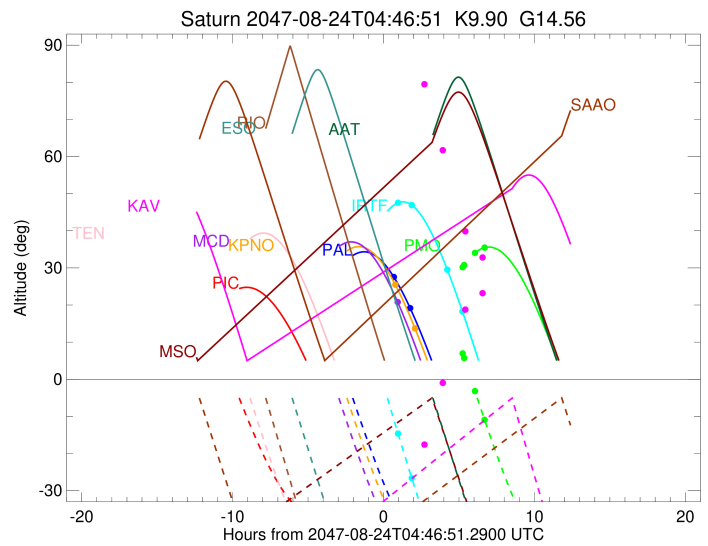
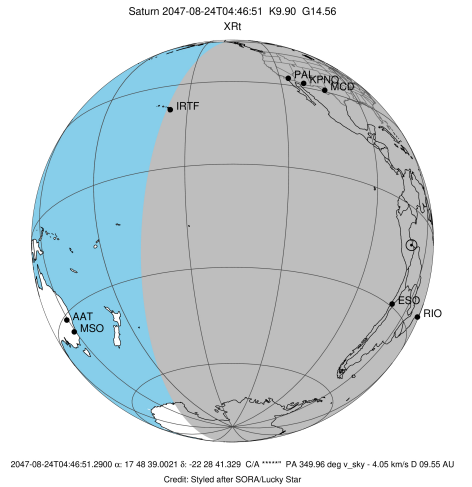


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+			AUG 24 05:26 - AUG 24 06:30	PnnRin
PMO	Purple Mtn Obs	32.1	118.8			+	AUG 24 11:29 - AUG 24 11:29	PnnRne
KPNO	Kitt Peak Natl	32.0	248.4	+			AUG 24 05:32 - AUG 24 06:48	PnnRin
MCD	McDonald Obs.	30.7	256.0	+			AUG 24 05:41 - AUG 24 05:41	PnnRin
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+		+	AUG 24 05:43 - AUG 24 10:02	PnnRie
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 : 2047-08-24T04:30:37.190
 Event type : XRt
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 4068973955290849152
 2Mass ID (if available) : 17483900-2228410
 ICRS Star Coord at Epoch: 17h 48m 39.00208s -22:28:41.32907s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 9.898
 G magnitude : 14.558
 RP magnitude : 13.356
 BP magnitude : 16.112
 DUPflag : 0
 Distance (au) : 9.546
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -4.05
 Sun-Target sep (deg) : 117.05
 Sun-Moon sep (deg) : 80.26
 B (ring opening deg) : 26.86
 PA of pole (deg) : 5.29
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.737
 C/A sky separation (km) : 67412.8
 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



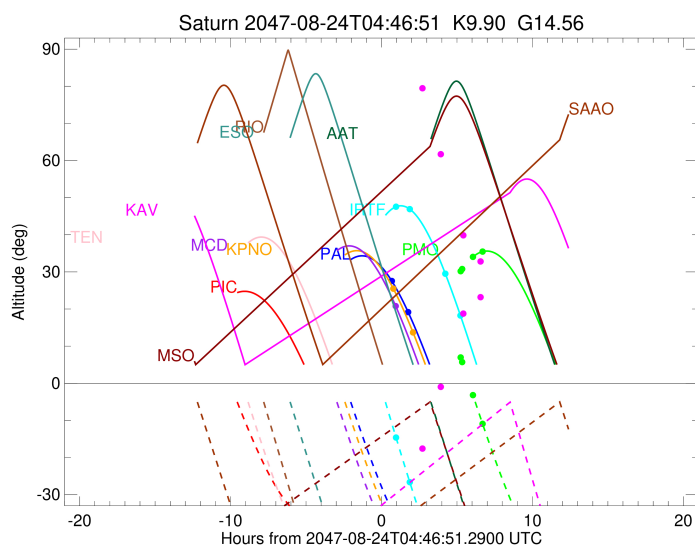
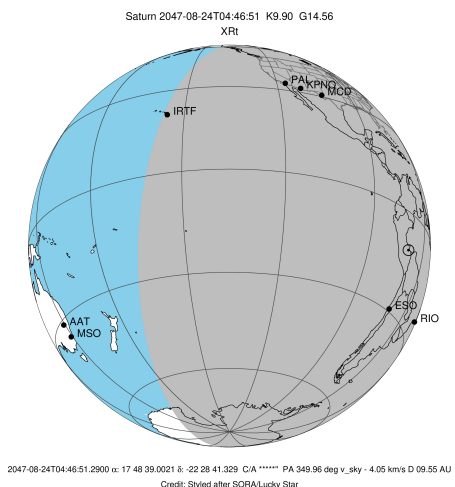
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-08-24T05:26:45.943		27.67	-34.12	140461.00	-1.30		
A (OER)	I	2047-08-24T06:30:09.310		19.55	-41.83	136774.40	-0.64		

No planet occultations

A (OER)	E	2047-08-24T08:43:46.063		-3.38x	-43.93	136774.40	0.59		
F ring	E	2047-08-24T09:55:57.691		-17.58x	-36.53	140461.00	1.09		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-08-24T05:17:34.740
 Event type : XRt
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 4068973955290849152
 2Mass ID (if available) : 17483900-2228410
 ICRS Star Coord at Epoch: 17h 48m 39.00208s -22:28:41.32907s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 9.898
 G magnitude : 14.558
 RP magnitude : 13.356
 BP magnitude : 16.112
 DUPflag : 0
 Distance (au) : 9.546
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -4.05
 Sun-Target sep (deg) : 117.05
 Sun-Moon sep (deg) : 79.15
 B (ring opening deg) : 26.86
 PA of pole (deg) : 5.29
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.898
 C/A sky separation (km) : 68530.7
 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



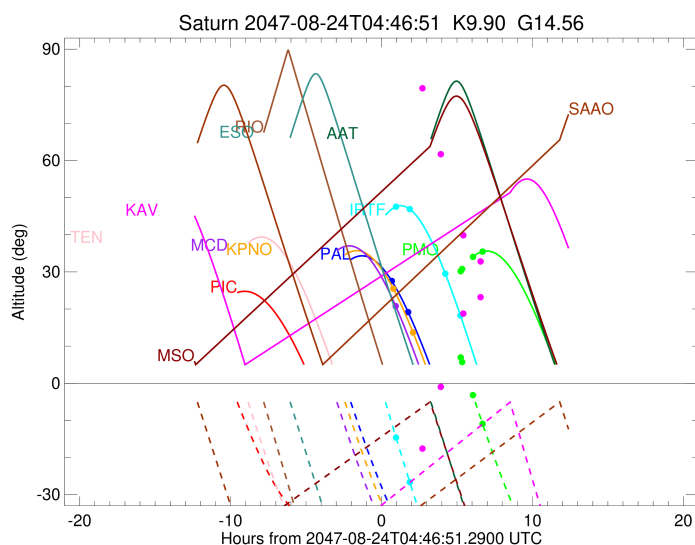
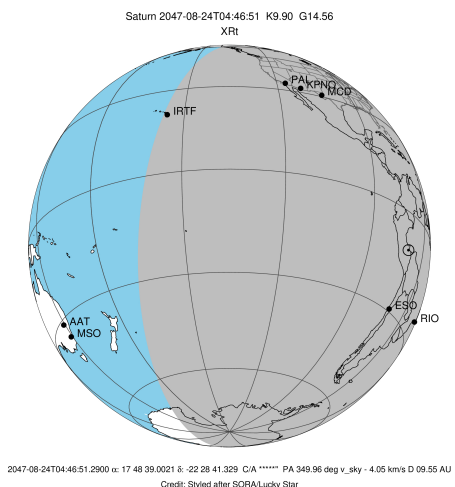
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-08-24T06:06:25.023	-7.66x	55.54x	140461.00	-1.75			
A (OER)	I	2047-08-24T06:45:30.331	-0.08x	48.04x	136774.40	-1.39			
Encke (OEG)	I	2047-08-24T07:28:39.509	7.90	39.25x	133744.89	-0.94			
Encke (IEG)	I	2047-08-24T07:34:33.002	8.95	38.03x	133423.31	-0.88			

No planet occultations

Encke (IEG)	E	2047-08-24T10:03:33.709	30.39	6.54x	133423.31	0.89			
Encke (OEG)	E	2047-08-24T10:09:21.466	30.94	5.32x	133744.89	0.96			
A (OER)	E	2047-08-24T10:51:35.933	34.11	-3.43x	136774.40	1.43			
F ring	E	2047-08-24T11:29:33.129	35.49	-11.10	140461.00	1.81			

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-08-24T04:28:10.840
 Event type : XRt
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 4068973955290849152
 2Mass ID (if available) : 17483900-2228410
 ICRS Star Coord at Epoch: 17h 48m 39.00208s -22:28:41.32907s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 9.898
 G magnitude : 14.558
 RP magnitude : 13.356
 BP magnitude : 16.112
 DUPflag : 0
 Distance (au) : 9.546
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -4.05
 Sun-Target sep (deg) : 117.05
 Sun-Moon sep (deg) : 80.27
 B (ring opening deg) : 26.86
 PA of pole (deg) : 5.29
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.769
 C/A sky separation (km) : 67634.3
 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



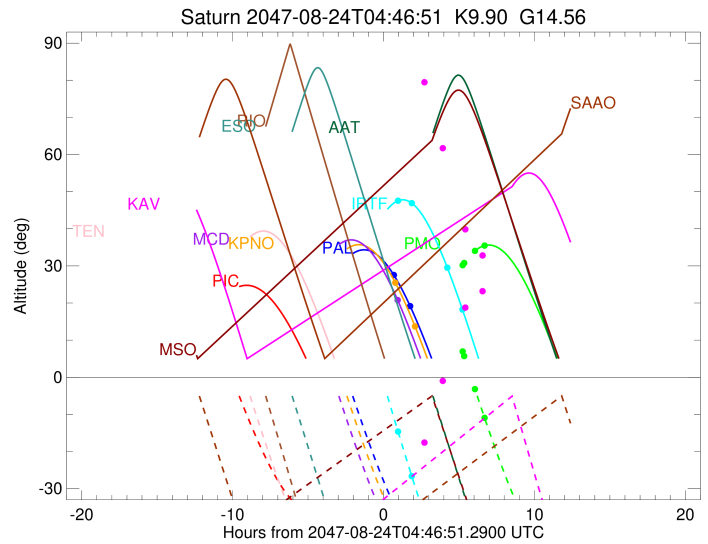
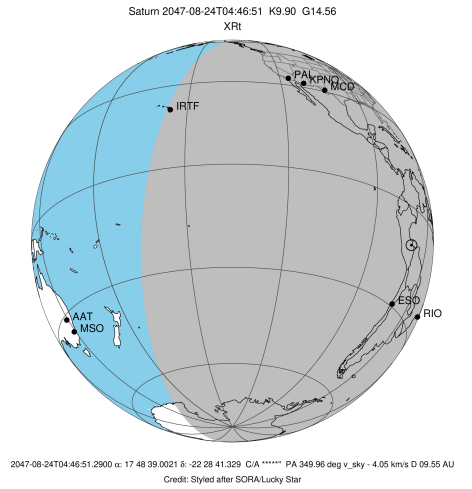
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-08-24T05:32:38.376		25.64	-38.88	140461.00	-1.20		
A (OER)	I	2047-08-24T06:48:00.308		14.39	-46.02	136774.41	-0.44		

No planet occultations

A (OER)	E	2047-08-24T08:22:42.819		-2.79x	-45.24	136774.42	0.41		
F ring	E	2047-08-24T09:47:32.985		-19.78x	-35.80	140461.00	1.01		

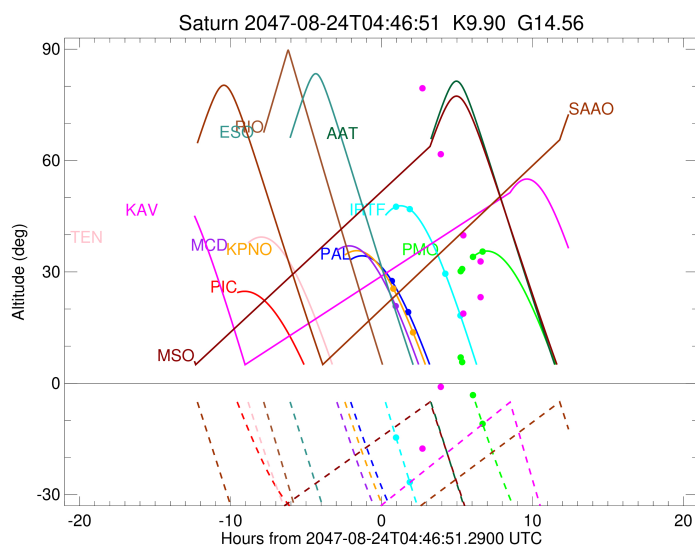
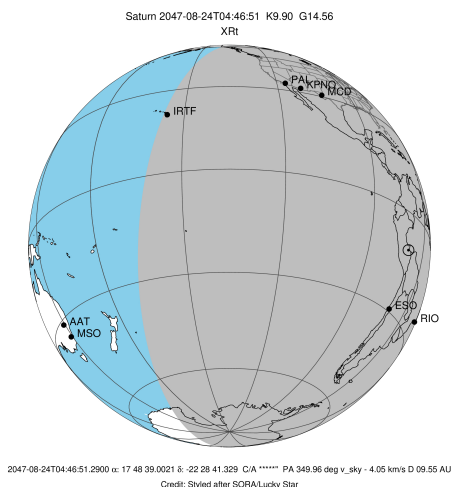
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-08-24T04:24:49.710
 Event type : XRt
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 4068973955290849152
 2Mass ID (if available) : 17483900-2228410
 ICRS Star Coord at Epoch: 17h 48m 39.00208s -22:28:41.32907s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 9.898
 G magnitude : 14.558
 RP magnitude : 13.356
 BP magnitude : 16.112
 DUPflag : 0
 Distance (au) : 9.545
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -4.05
 Sun-Target sep (deg) : 117.05
 Sun-Moon sep (deg) : 80.25
 B (ring opening deg) : 26.86
 PA of pole (deg) : 5.29
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.813
 C/A sky separation (km) : 67932.9
 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



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	2047-08-24T05:41:50.120		21.02	-44.50	140461.00	-1.06		
No planet occultations									
F ring	E	2047-08-24T09:36:37.520		-23.49x	-33.70	140461.00	0.89		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-08-24T04:50:03.810
 Event type : XRt
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 4068973955290849152
 2Mass ID (if available) : 17483900-2228410
 ICRS Star Coord at Epoch: 17h 48m 39.00208s -22:28:41.32907s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 9.898
 G magnitude : 14.558
 RP magnitude : 13.356
 BP magnitude : 16.112
 DUPflag : 0
 Distance (au) : 9.546
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -4.05
 Sun-Target sep (deg) : 117.05
 Sun-Moon sep (deg) : 80.33
 B (ring opening deg) : 26.86
 PA of pole (deg) : 5.29
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.794
 C/A sky separation (km) : 67807.8
 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	2047-08-24T05:43:39.158		47.53	-14.40	140461.00	-1.45		
A (OER)	I	2047-08-24T06:37:14.192		47.01	-26.21	136774.40	-0.83		
No planet occultations									
A (OER)	E	2047-08-24T09:03:02.441		29.08	-53.31	136774.40	0.78		
F ring	E	2047-08-24T10:02:05.649		17.96	-58.77	140461.00	1.29		