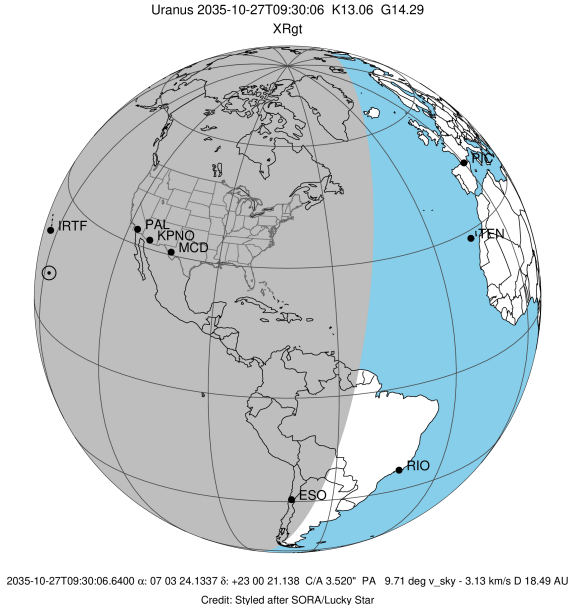


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2035-10-27T09:30:06.640  
 Event type : XRgt  
 : No Uranus occs  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3368434513997982080  
 2Mass ID (if available) : 07032415+2300213

ICRS Star Coord at Epoch: 07h 03m 24.13374s +23:00:21.13756s

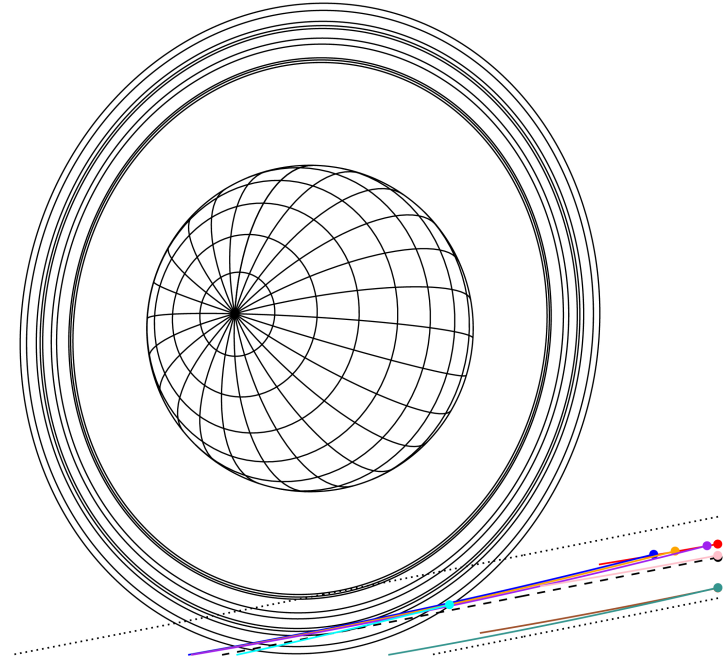
RUWE (>1.4 is poor) : 1.14  
 K magnitude : 13.058  
 G magnitude : 14.290  
 RP magnitude : 13.845  
 BP magnitude : 14.571  
 DUPflag : 0  
 Distance (au) : 18.495  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -3.13  
 Sun-Target sep (deg) : 108.73  
 Sun-Moon sep (deg) : 63.65  
 B (ring opening deg) : 61.97  
 PA of pole (deg) : 78.91

#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



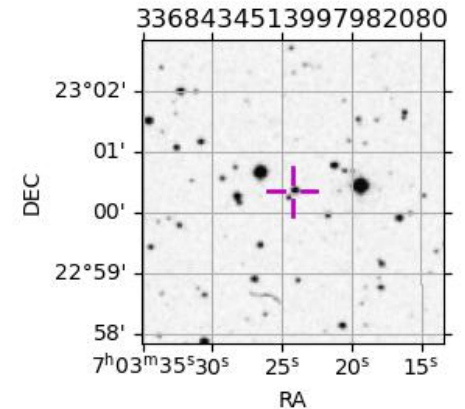
Uranus 2035-10-27T09:30:06 K13.06 G14.29 XRgt

Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO

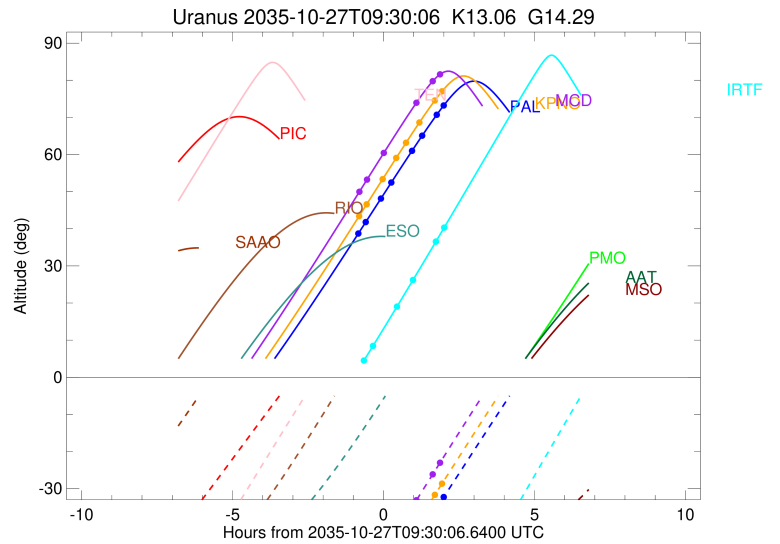
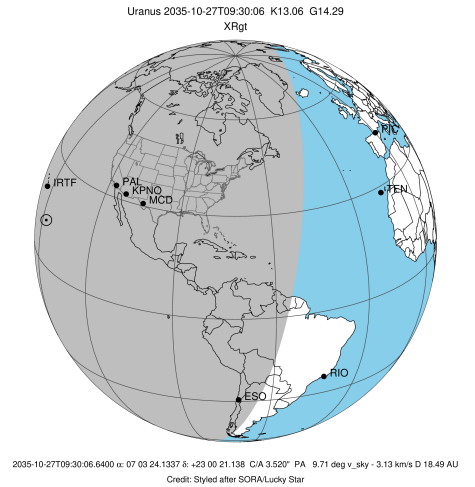


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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 (200")	33.4	243.1	++++		++++	OCT 27 08:44 - OCT 27 11:24	PnnRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	++++		++++	OCT 27 08:45 - OCT 27 11:21	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++		+++	OCT 27 08:46 - OCT 27 11:17	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++		+++	OCT 27 08:56 - OCT 27 11:24	PnnRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European Southern Obs	-29.3	289.3					PnnRnn
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2035-10-27T09:47:11.200  
 Event type : XRgt  
 : No Uranus occs  
 : 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 : 3368434513997982080  
 2Mass ID (if available) : 07032415+2300213  
 ICRS Star Coord at Epoch: 07h 03m 24.13374s +23:00:21.13756s  
 RUWE (>1.4 is poor) : 1.14  
 K magnitude : 13.058  
 G magnitude : 14.290  
 RP magnitude : 13.845  
 BP magnitude : 14.571  
 DUPflag : 0  
 Distance (au) : 18.495  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -3.13  
 Sun-Target sep (deg) : 108.73  
 Sun-Moon sep (deg) : 64.56  
 B (ring opening deg) : 61.97  
 PA of pole (deg) : 78.91  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.475  
 C/A sky separation (km) : 46610.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ura111.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ura111.bsp  
 ura161.bsp  
 vgr2.ura161.bsp  
 peph.ura160.bsp  
 earthstns\_itr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



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

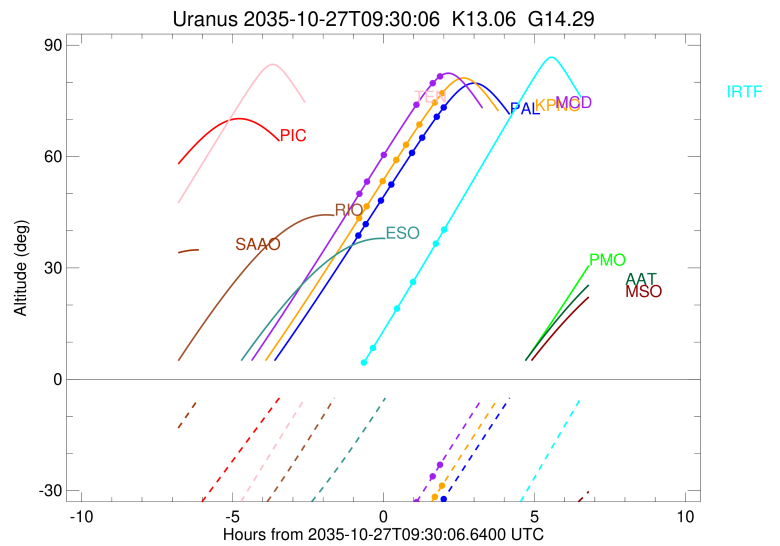
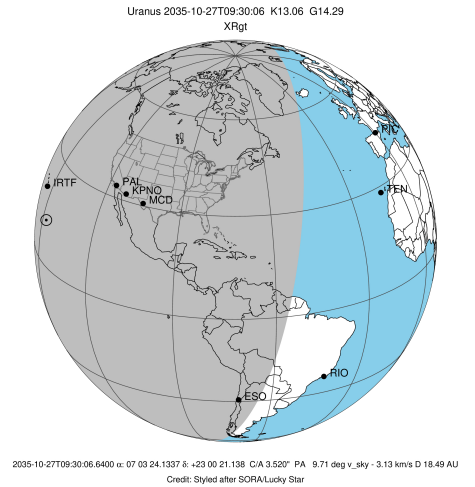
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-10-27T08:44:09.084		39.57	-63.68	50837.61	-1.30		
lambda	I	2035-10-27T08:55:00.230		41.85	-62.06	50026.71	-1.17		
delta	I	2035-10-27T09:25:22.847		48.22	-56.95	48300.35	-0.71		
gamma	I	2035-10-27T09:46:25.631		52.63	-53.08	47624.45	-0.35		

No planet occultations

gamma	E	2035-10-27T10:26:01.108		60.83	-45.35	47623.53	0.36		
delta	E	2035-10-27T10:46:38.185		65.01	-41.18	48300.35	0.73		
lambda	E	2035-10-27T11:15:46.635		70.68	-35.19	50026.71	1.23		
epsilon	E	2035-10-27T11:24:54.736		72.35	-33.29	50744.08	1.38		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2035-10-27T09:46:16.010
Event type          : XRgt
: No Uranus occs
: 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      : 3368434513997982080
2Mass ID (if available) : 07032415+2300213
ICRS Star Coord at Epoch: 07h 03m 24.13374s +23:00:21.13756s
RUWE (>1.4 is poor) : 1.14
K magnitude         : 13.058
G magnitude         : 14.290
RP magnitude        : 13.845
BP magnitude        : 14.571
DUPflag            : 0
Distance (au)       : 18.495
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -3.13
Sun-Target sep (deg) : 108.73
Sun-Moon sep (deg)  : 64.58
B (ring opening deg) : 61.97
PA of pole (deg)    : 78.91
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.489
C/A sky separation (km) : 46801.0
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.spk
ura111.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ura111.bsp
ura161.bsp
vgr2.ura161.bsp
peph.ura160.bsp
earthstns_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



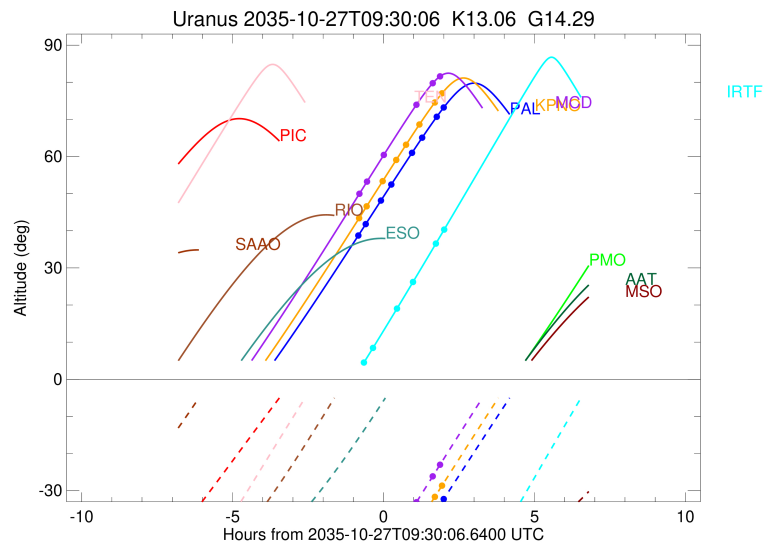
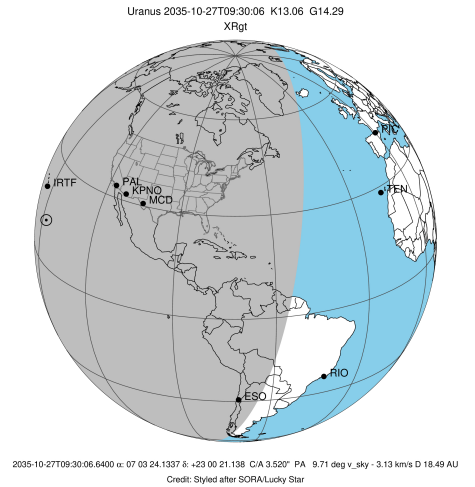
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b? alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-10-27T08:45:47.725	44.28	-60.97	50834.05	-1.28		
lambda	I	2035-10-27T08:56:49.323	46.63	-59.03	50026.71	-1.14		
delta	I	2035-10-27T09:28:49.397	53.45	-52.99	48300.35	-0.64		
gamma	I	2035-10-27T09:57:10.147	59.45	-47.32	47624.16	-0.15		

No planet occultations

gamma	E	2035-10-27T10:13:09.311	62.81	-44.05	47623.79	0.15		
delta	E	2035-10-27T10:41:06.988	68.56	-38.23	48300.35	0.66		
lambda	E	2035-10-27T11:11:59.824	74.53	-31.71	50026.71	1.20		
epsilon	E	2035-10-27T11:21:22.787	76.19	-29.73	50743.95	1.35		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2035-10-27T09:44:40.800  
 Event type : XRgt  
 : No Uranus occs  
 : 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 : 3368434513997982080  
 2Mass ID (if available) : 07032415+2300213  
 ICRS Star Coord at Epoch: 07h 03m 24.13374s +23:00:21.13756s  
 RUWE (>1.4 is poor) : 1.14  
 K magnitude : 13.058  
 G magnitude : 14.290  
 RP magnitude : 13.845  
 BP magnitude : 14.571  
 DUPflag : 0  
 Distance (au) : 18.495  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -3.13  
 Sun-Target sep (deg) : 108.73  
 Sun-Moon sep (deg) : 64.60  
 B (ring opening deg) : 61.97  
 PA of pole (deg) : 78.91  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.502  
 C/A sky separation (km) : 46968.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ura111.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ura111.bsp  
 ura161.bsp  
 vgr2.ura161.bsp  
 peph.ura160.bsp  
 earthstns\_itr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



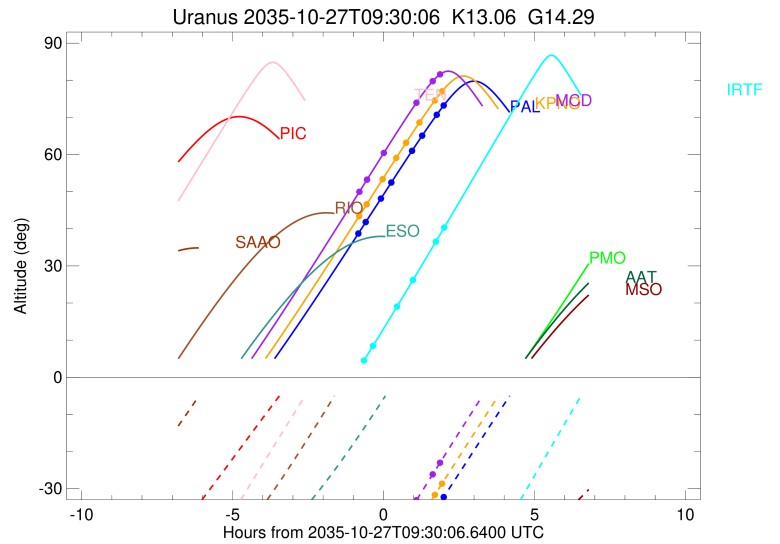
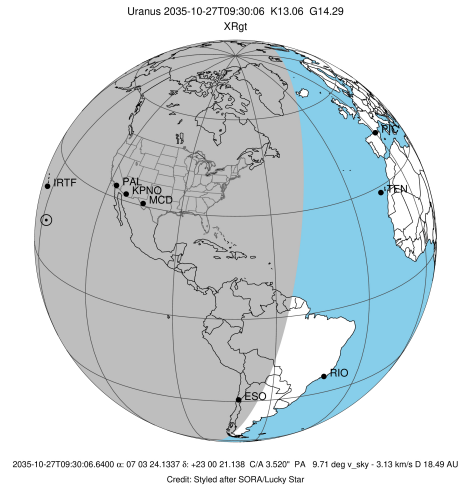
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-10-27T08:46:26.420		50.89	-55.86	50830.48	-1.26		
lambda	I	2035-10-27T08:57:34.848		53.29	-53.65	50026.71	-1.12		
delta	I	2035-10-27T09:31:09.517		60.52	-46.78	48300.35	-0.58		

No planet occultations

delta	E	2035-10-27T10:35:07.393		73.87	-33.21	48300.35	0.59		
lambda	E	2035-10-27T11:07:45.314		79.72	-26.19	50026.71	1.17		
epsilon	E	2035-10-27T11:17:21.543		81.04	-24.12	50743.89	1.32		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2035-10-27T09:51:05.400  
 Event type : XRgt  
 : No Uranus occs  
 : 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 : 3368434513997982080  
 2Mass ID (if available) : 07032415+2300213  
 ICRS Star Coord at Epoch: 07h 03m 24.13374s +23:00:21.13756s  
 RUWE (>1.4 is poor) : 1.14  
 K magnitude : 13.058  
 G magnitude : 14.290  
 RP magnitude : 13.845  
 BP magnitude : 14.571  
 DUPflag : 0  
 Distance (au) : 18.495  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -3.13  
 Sun-Target sep (deg) : 108.73  
 Sun-Moon sep (deg) : 64.24  
 B (ring opening deg) : 61.97  
 PA of pole (deg) : 78.91  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.522  
 C/A sky separation (km) : 47246.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ura111.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ura111.bsp  
 ura161.bsp  
 vgr2.ura161.bsp  
 peph.ura160.bsp  
 earthstns\_itr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-10-27T08:56:07.566		5.58	-71.93	50833.35	-1.07		
lambda	I	2035-10-27T09:09:27.679		8.50	-74.83	50026.71	-0.93		
delta	I	2035-10-27T09:57:56.152		19.27	-82.83	48300.35	-0.24		

No planet occultations

delta	E	2035-10-27T10:27:46.583		25.98	-81.30	48300.35	0.24		
lambda	E	2035-10-27T11:13:59.544		36.49	-72.24	50026.71	1.00		
epsilon	E	2035-10-27T11:24:59.035		39.01	-69.79	50743.65	1.17		