

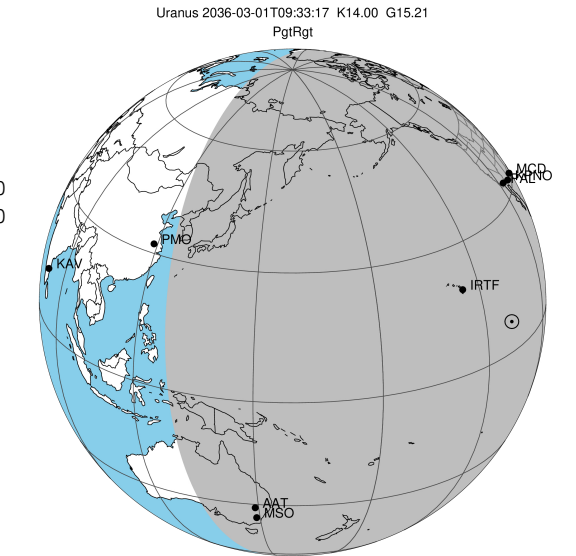
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-03-01T09:33:17.210  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3379627374867284352  
 2Mass ID (if available) : 06461815+2324058

ICRS Star Coord at Epoch: 06h 46m 18.16798s +23:24:05.73157s

RUWE (>1.4 is poor) : 1.00  
 K magnitude : 13.996  
 G magnitude : 15.209  
 RP magnitude : 14.809  
 BP magnitude : 15.449  
 DUPflag : 0  
 Distance (au) : 18.305  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -8.35  
 Sun-Target sep (deg) : 119.73  
 Sun-Moon sep (deg) : 83.04  
 B (ring opening deg) : 65.71  
 PA of pole (deg) : 74.60

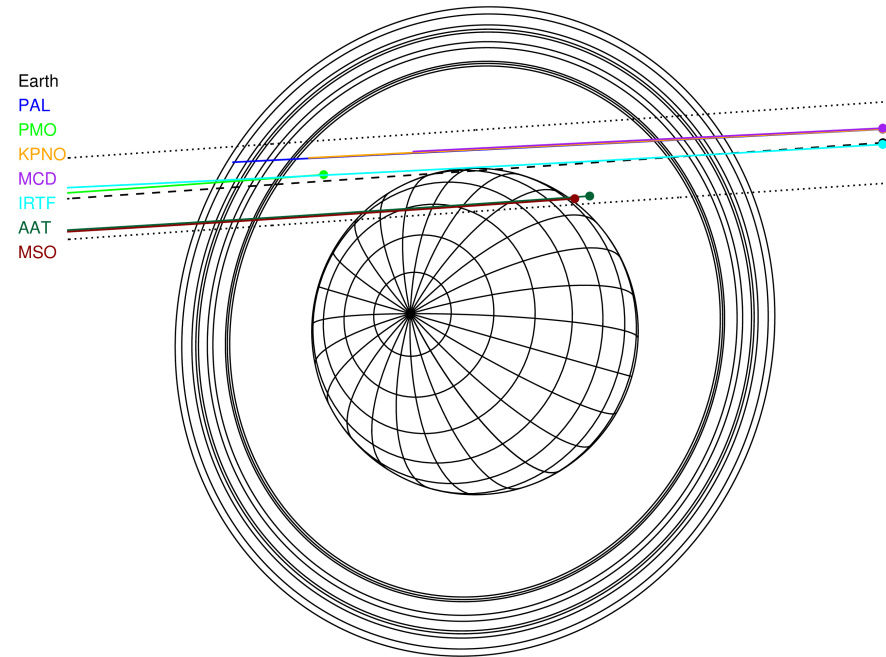
# a(km) ring

- 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



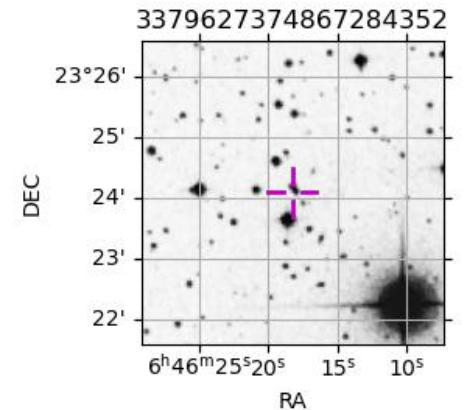
2036-03-01T09:33:17.2100 α: 06 46 18.1680 δ: +23 24 05.732 C/A 1.897'' PA 183.93 deg v\_sky - 8.35 km/s D 18.31 AU  
 Credit: Styled after SORA/Lucky Star

Uranus 2036-03-01T09:33:17 K14.00 G15.21 PgtRgt

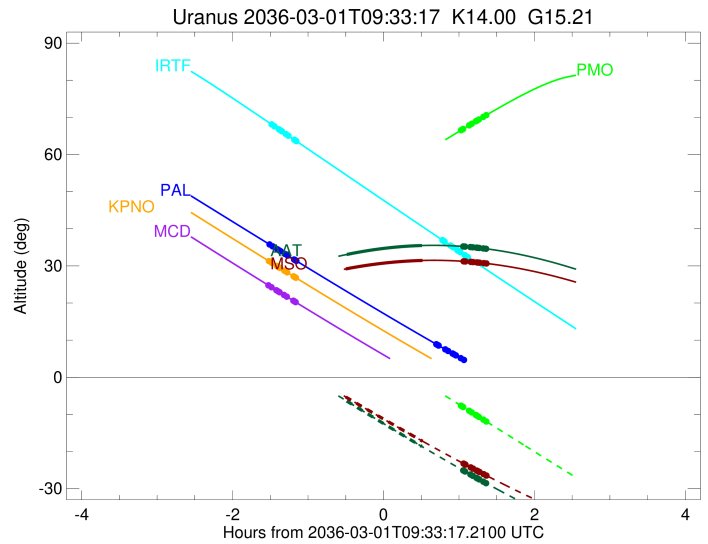
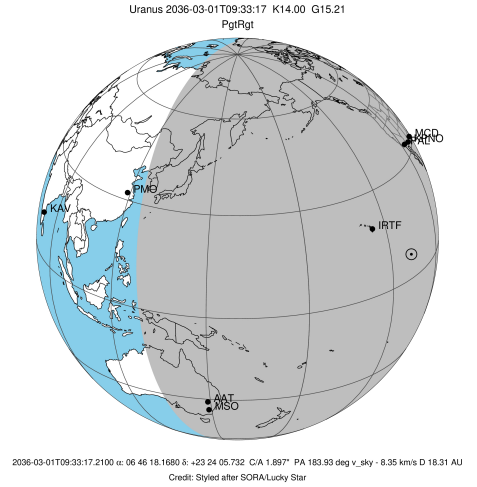


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++		+++++	MAR 01 08:03 - MAR 01 10:34	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8			+++++	MAR 01 10:35 - MAR 01 10:54	PnnRne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++			MAR 01 08:02 - MAR 01 08:23	PnnRin
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++			MAR 01 08:02 - MAR 01 08:23	PnnRin
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++		+++++	MAR 01 08:05 - MAR 01 10:40	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		+ +	+++++	MAR 01 09:04 - MAR 01 10:54	PieRne
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0		+ +	+++++	MAR 01 09:03 - MAR 01 10:55	PieRne



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-03-01T09:22:08.840  
 Event type : PgtRgt  
 : Uranus 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 : 3379627374867284352  
 2Mass ID (if available) : 06461815+2324058  
 ICRS Star Coord at Epoch: 06h 46m 18.16798s +23:24:05.73157s  
 RUWE (>1.4 is poor) : 1.00  
 K magnitude : 13.996  
 G magnitude : 15.209  
 RP magnitude : 14.809  
 BP magnitude : 15.449  
 DUPflag : 0  
 Distance (au) : 18.305  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -8.35  
 Sun-Target sep (deg) : 119.73  
 Sun-Moon sep (deg) : 83.40  
 B (ring opening deg) : 65.71  
 PA of pole (deg) : 74.60  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 2.137  
 C/A sky separation (km) : 28377.1  
 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

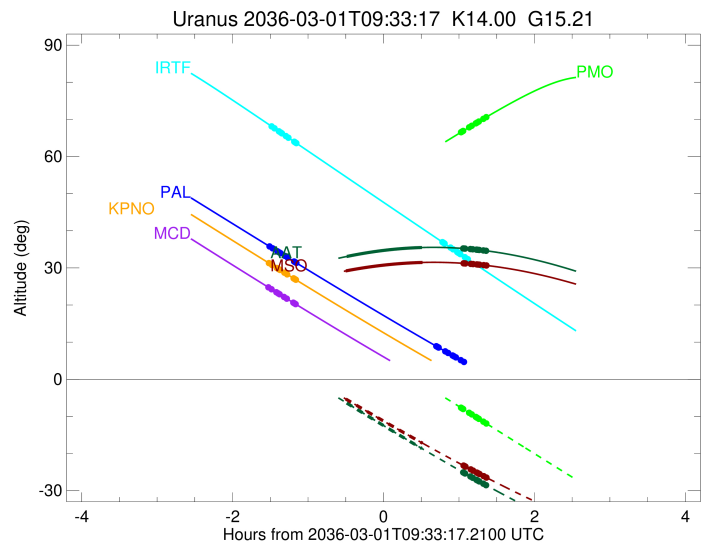
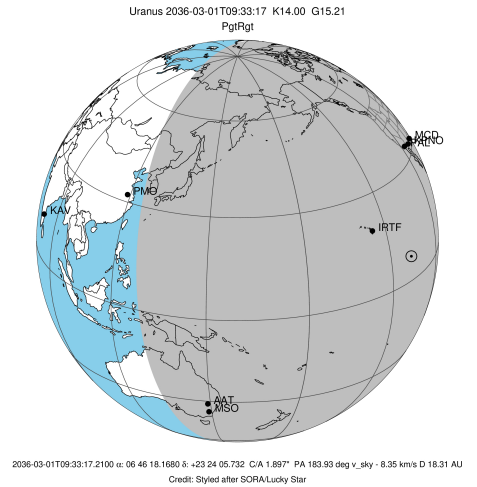


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-03-01T08:03:26.509		35.62	-64.12	50817.08	-7.66		
lambda	I	2036-03-01T08:05:09.716		35.26	-64.11	50026.71	-7.63		
delta	I	2036-03-01T08:08:58.146		34.47	-64.05	48300.35	-7.48		
gamma	I	2036-03-01T08:10:29.149		34.16	-64.01	47621.94	-7.42		
eta	I	2036-03-01T08:11:29.369		33.95	-63.99	47176.12	-7.38		
beta	I	2036-03-01T08:14:59.316		33.22	-63.89	45641.94	-7.23		
alpha	I	2036-03-01T08:17:04.130		32.79	-63.82	44747.25	-7.13		
4	I	2036-03-01T08:22:13.354		31.72	-63.61	42582.80	-6.86		
5	I	2036-03-01T08:23:04.952		31.54	-63.57	42222.12	-6.79		
6	I	2036-03-01T08:24:06.050		31.33	-63.52	41815.88	-6.75		

No planet occultations

6	E	2036-03-01T10:15:22.125		8.88	-49.30	41875.21	6.57		
5	E	2036-03-01T10:16:03.696		8.75	-49.18	42157.02	6.61		
4	E	2036-03-01T10:17:12.252		8.53	-48.97	42613.78	6.68		
alpha	E	2036-03-01T10:22:21.595		7.53	-48.05	44731.11	6.92		
beta	E	2036-03-01T10:24:35.435		7.10	-47.64	45659.40	7.00		
eta	E	2036-03-01T10:28:09.988		6.41	-46.99	47176.12	7.14		
gamma	E	2036-03-01T10:29:12.594		6.21	-46.79	47624.49	7.18		
delta	E	2036-03-01T10:30:46.369		5.91	-46.50	48300.35	7.23		
lambda	E	2036-03-01T10:34:42.945		5.16	-45.77	50026.71	7.36		
epsilon	E	2036-03-01T10:37:01.269		4.72x	-45.34	51049.22	7.39		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-03-01T09:40:37.760  
 Event type : PgtRgt  
 : Uranus 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 : 3379627374867284352  
 2Mass ID (if available) : 06461815+2324058  
 ICRS Star Coord at Epoch: 06h 46m 18.16798s +23:24:05.73157s  
 RUWE (>1.4 is poor) : 1.00  
 K magnitude : 13.996  
 G magnitude : 15.209  
 RP magnitude : 14.809  
 BP magnitude : 15.449  
 DUPflag : 0  
 Distance (au) : 18.305  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -8.35  
 Sun-Target sep (deg) : 119.73  
 Sun-Moon sep (deg) : 83.73  
 B (ring opening deg) : 65.71  
 PA of pole (deg) : 74.60  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.979  
 C/A sky separation (km) : 26279.2  
 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

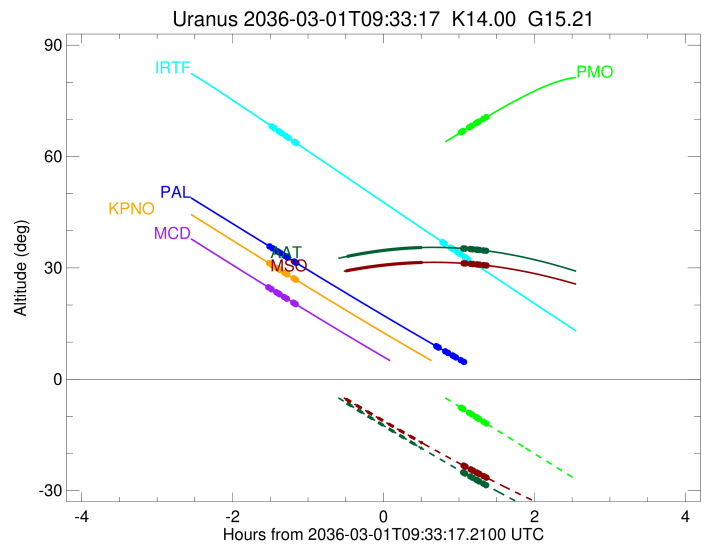
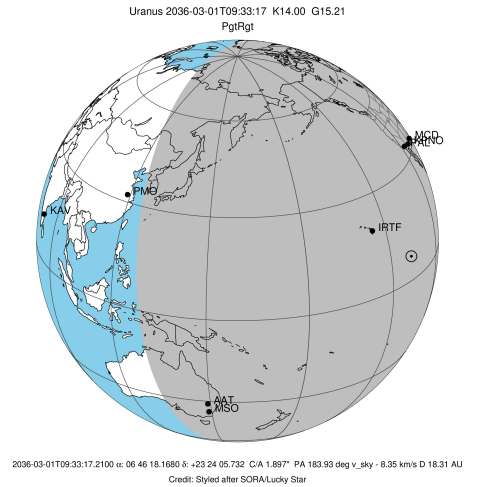


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-03-01T08:20:53.127		38.21	19.94x	50822.17	-7.94		
lambda	I	2036-03-01T08:22:33.342		38.56	19.61x	50026.71	-7.91		
delta	I	2036-03-01T08:26:12.975		39.34	18.89x	48300.35	-7.80		
gamma	I	2036-03-01T08:27:40.155		39.65	18.60x	47622.02	-7.76		
eta	I	2036-03-01T08:28:37.760		39.85	18.42x	47176.12	-7.72		
beta	I	2036-03-01T08:31:57.849		40.56	17.76x	45642.13	-7.60		
alpha	I	2036-03-01T08:33:56.397		40.98	17.36x	44746.65	-7.53		
4	I	2036-03-01T08:38:47.946		42.01	16.40x	42581.15	-7.32		
5	I	2036-03-01T08:39:35.560		42.18	16.24x	42225.18	-7.26		
6	I	2036-03-01T08:40:33.332		42.38	16.05x	41814.44	-7.23		

No planet occultations

6	E	2036-03-01T10:35:02.331		66.57	-7.68	41876.76	7.31		
5	E	2036-03-01T10:35:39.966		66.70	-7.81	42158.96	7.34		
4	E	2036-03-01T10:36:41.137		66.91	-8.03	42612.27	7.40		
alpha	E	2036-03-01T10:41:21.138		67.86	-9.02	44728.51	7.61		
beta	E	2036-03-01T10:43:23.474		68.28	-9.45	45661.00	7.69		
eta	E	2036-03-01T10:46:38.982		68.94	-10.14	47176.12	7.82		
gamma	E	2036-03-01T10:47:36.253		69.13	-10.34	47624.88	7.85		
delta	E	2036-03-01T10:49:01.997		69.42	-10.65	48300.35	7.90		
lambda	E	2036-03-01T10:52:38.834		70.14	-11.41	50026.71	8.02		
epsilon	E	2036-03-01T10:54:49.324		70.57	-11.87	51077.31	8.05		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-03-01T09:21:52.340  
 Event type : PgtRgt  
 : Uranus 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 : 3379627374867284352  
 2Mass ID (if available) : 06461815+2324058  
 ICRS Star Coord at Epoch: 06h 46m 18.16798s +23:24:05.73157s  
 RUWE (>1.4 is poor) : 1.00  
 K magnitude : 13.996  
 G magnitude : 15.209  
 RP magnitude : 14.809  
 BP magnitude : 15.449  
 DUPflag : 0  
 Distance (au) : 18.305  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -8.35  
 Sun-Target sep (deg) : 119.73  
 Sun-Moon sep (deg) : 83.33  
 B (ring opening deg) : 65.71  
 PA of pole (deg) : 74.60  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 2.143  
 C/A sky separation (km) : 28456.2  
 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

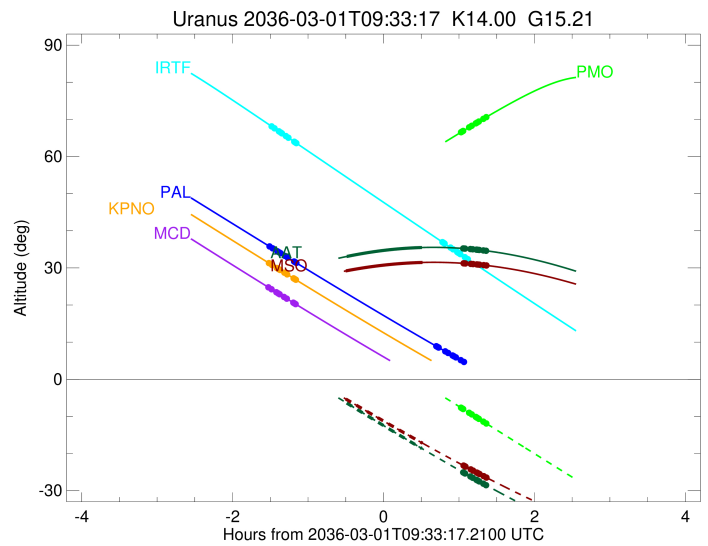
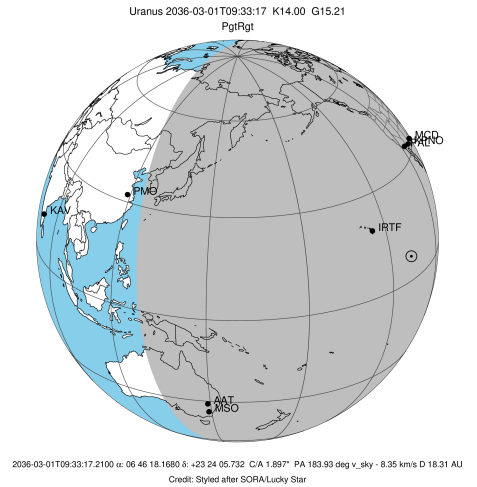


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-03-01T08:02:56.817		31.13	-64.88	50816.75	-7.63		
lambda	I	2036-03-01T08:04:40.486		30.77	-64.78	50026.71	-7.59		
delta	I	2036-03-01T08:08:30.064		29.97	-64.55	48300.35	-7.45		
gamma	I	2036-03-01T08:10:01.539		29.65	-64.45	47621.93	-7.39		
eta	I	2036-03-01T08:11:02.074		29.44	-64.38	47176.12	-7.34		
beta	I	2036-03-01T08:14:33.154		28.70	-64.13	45641.93	-7.19		
alpha	I	2036-03-01T08:16:38.657		28.26	-63.96	44747.28	-7.09		
4	I	2036-03-01T08:21:49.688		27.18	-63.53	42582.89	-6.82		
5	I	2036-03-01T08:22:41.645		27.00	-63.45	42221.95	-6.75		
6	I	2036-03-01T08:23:43.084		26.79	-63.36	41815.96	-6.71		

No planet occultations

6	E	2036-03-01T10:15:11.239		4.29x	-46.10	41875.16	6.53		
5	E	2036-03-01T10:15:53.097		4.16x	-45.97	42156.98	6.56		
4	E	2036-03-01T10:17:02.147		3.93x	-45.74	42613.82	6.63		
alpha	E	2036-03-01T10:22:13.570		2.94x	-44.74	44731.19	6.87		
beta	E	2036-03-01T10:24:28.259		2.51x	-44.30	45659.35	6.96		
eta	E	2036-03-01T10:28:04.175		1.82x	-43.60	47176.12	7.10		
gamma	E	2036-03-01T10:29:07.169		1.62x	-43.39	47624.48	7.14		
delta	E	2036-03-01T10:30:41.523		1.32x	-43.08	48300.35	7.19		
lambda	E	2036-03-01T10:34:39.532		0.57x	-42.30	50026.71	7.31		
epsilon	E	2036-03-01T10:36:58.581		0.13x	-41.84	51048.49	7.34		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-03-01T09:21:45.330  
 Event type : PgtRgt  
 : Uranus 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 : 3379627374867284352  
 2Mass ID (if available) : 06461815+2324058  
 ICRS Star Coord at Epoch: 06h 46m 18.16798s +23:24:05.73157s  
 RUWE (>1.4 is poor) : 1.00  
 K magnitude : 13.996  
 G magnitude : 15.209  
 RP magnitude : 14.809  
 BP magnitude : 15.449  
 DUPflag : 0  
 Distance (au) : 18.305  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -8.35  
 Sun-Target sep (deg) : 119.73  
 Sun-Moon sep (deg) : 83.23  
 B (ring opening deg) : 65.71  
 PA of pole (deg) : 74.60  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 2.157  
 C/A sky separation (km) : 28633.4  
 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	2036-03-01T08:02:32.610		24.61	-63.56	50815.84	-7.56		
lambda	I	2036-03-01T08:04:17.076		24.24	-63.36	50026.71	-7.52		
delta	I	2036-03-01T08:08:08.749		23.43	-62.90	48300.35	-7.38		
gamma	I	2036-03-01T08:09:41.088		23.11	-62.71	47621.92	-7.32		
eta	I	2036-03-01T08:10:42.200		22.90	-62.59	47176.12	-7.27		
beta	I	2036-03-01T08:14:15.368		22.16	-62.13	45641.90	-7.12		
alpha	I	2036-03-01T08:16:22.140		21.72	-61.85	44747.37	-7.02		
4	I	2036-03-01T08:21:36.539		20.62	-61.14	42583.13	-6.75		
5	I	2036-03-01T08:22:29.203		20.44	-61.02	42221.51	-6.67		
6	I	2036-03-01T08:23:31.252		20.23	-60.87	41816.17	-6.63		

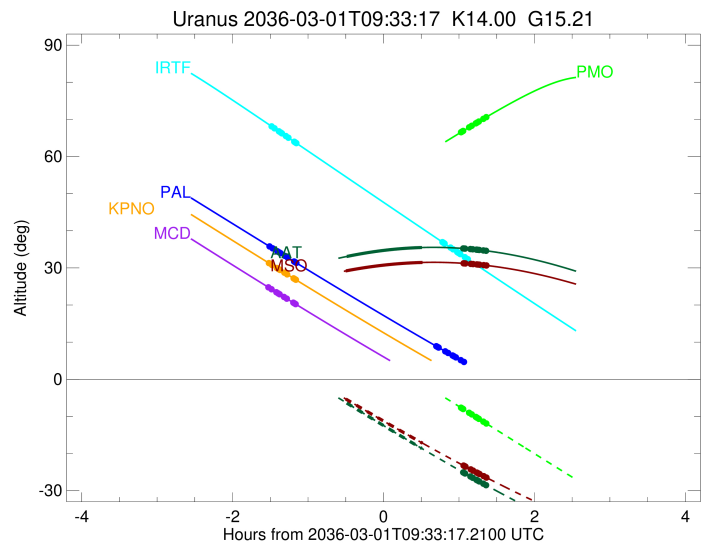
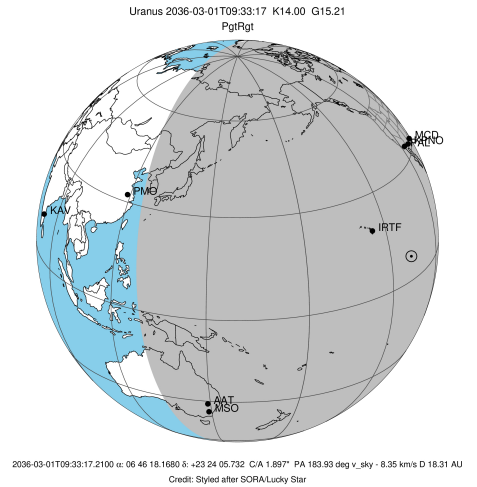
No planet occultations

6	E	2036-03-01T10:15:05.435	-2.06x	-40.57	41875.05	6.45			
5	E	2036-03-01T10:15:47.797	-2.19x	-40.42	42156.88	6.49			
4	E	2036-03-01T10:16:57.717	-2.41x	-40.19	42613.91	6.55			
alpha	E	2036-03-01T10:22:12.731	-3.40x	-39.10	44731.34	6.80			
beta	E	2036-03-01T10:24:28.855	-3.82x	-38.64	45659.26	6.89			
eta	E	2036-03-01T10:28:07.068	-4.50x	-37.88	47176.12	7.03			
gamma	E	2036-03-01T10:29:10.709	-4.70x	-37.66	47624.46	7.06			
delta	E	2036-03-01T10:30:46.026	-4.99x	-37.33	48300.35	7.12			
lambda	E	2036-03-01T10:34:46.395	-5.73x	-36.50	50026.71	7.24			
epsilon	E	2036-03-01T10:37:06.581	-6.16x	-36.01	51047.00	7.27			



```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch              : 2036-03-01T09:24:17.200
Event type             : PgtRgt
: Uranus 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        : 3379627374867284352
2Mass ID (if available) : 06461815+2324058
ICRS Star Coord at Epoch: 06h 46m 18.16798s +23:24:05.73157s
RUWE (>1.4 is poor)  : 1.00
K magnitude           : 13.996
G magnitude           : 15.209
RP magnitude          : 14.809
BP magnitude          : 15.449
DUPflag              : 0
Distance (au)         : 18.305
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -8.35
Sun-Target sep (deg)  : 119.73
Sun-Moon sep (deg)    : 83.80
B (ring opening deg)  : 65.71
PA of pole (deg)      : 74.60
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.932
C/A sky separation (km) : 25656.1
NAIF SPICE kernels    : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```

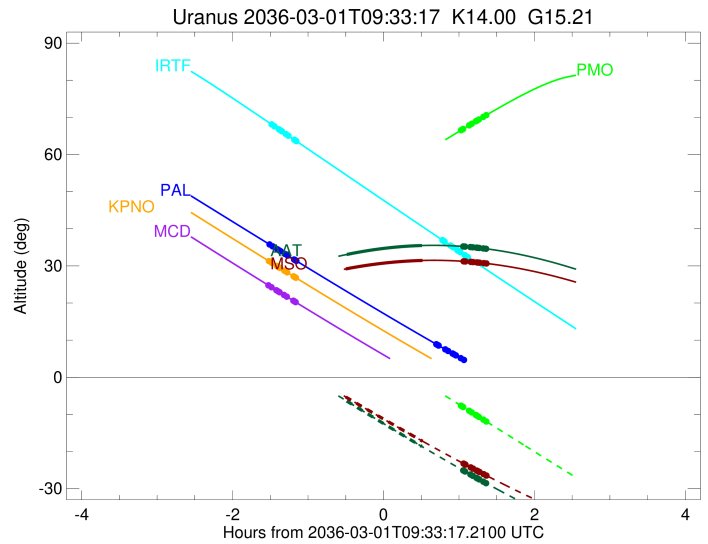
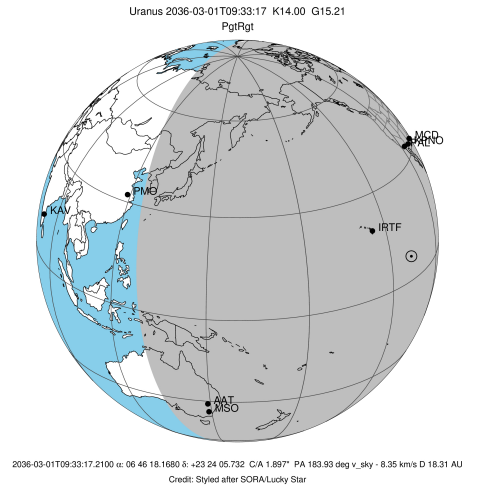


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-03-01T08:05:00.203		67.97	-51.82	50831.58	-8.20		
lambda	I	2036-03-01T08:06:38.418		67.60	-52.20	50026.71	-8.17		
delta	I	2036-03-01T08:10:11.162		66.78	-53.01	48300.35	-8.06		
gamma	I	2036-03-01T08:11:35.586		66.46	-53.33	47622.15	-8.01		
eta	I	2036-03-01T08:12:31.392		66.25	-53.54	47176.12	-7.98		
beta	I	2036-03-01T08:15:45.122		65.50	-54.27	45642.41	-7.85		
alpha	I	2036-03-01T08:17:40.049		65.06	-54.70	44745.84	-7.78		
4	I	2036-03-01T08:22:22.227		63.98	-55.77	42579.25	-7.57		
5	I	2036-03-01T08:23:07.489		63.81	-55.94	42228.61	-7.51		
6	I	2036-03-01T08:24:04.037		63.59	-56.15	41812.91	-7.48		

No planet occultations

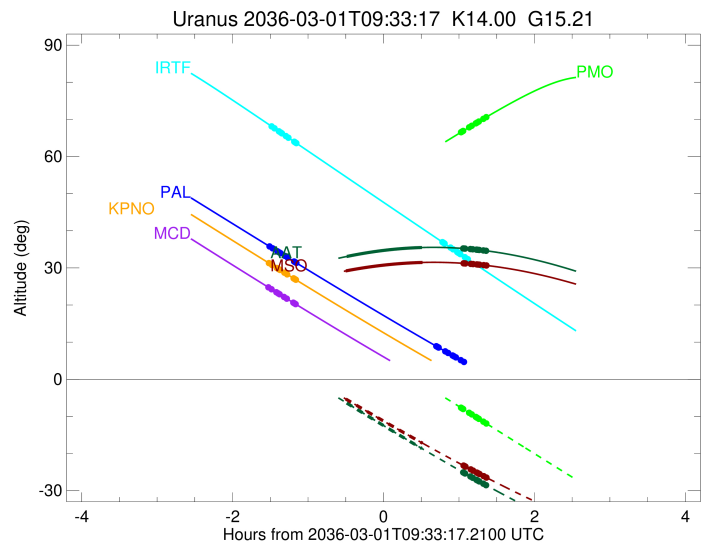
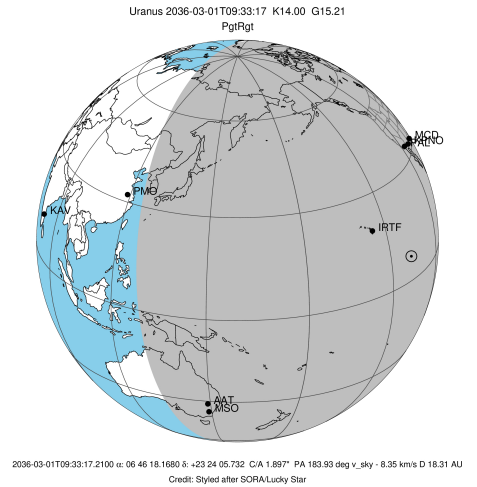
6	E	2036-03-01T10:20:15.052		36.92	-77.13	41876.73	7.32		
5	E	2036-03-01T10:20:52.623		36.78	-77.17	42158.91	7.35		
4	E	2036-03-01T10:21:53.765		36.55	-77.23	42612.31	7.40		
alpha	E	2036-03-01T10:26:34.164		35.48	-77.44	44728.63	7.59		
beta	E	2036-03-01T10:28:36.930		35.02	-77.51	45660.91	7.66		
eta	E	2036-03-01T10:31:53.519		34.27	-77.56	47176.12	7.77		
gamma	E	2036-03-01T10:32:51.174		34.05	-77.57	47624.85	7.80		
delta	E	2036-03-01T10:34:17.562		33.73	-77.57	48300.35	7.84		
lambda	E	2036-03-01T10:37:56.330		32.90	-77.54	50026.71	7.94		
epsilon	E	2036-03-01T10:40:07.837		32.40	-77.48	51074.53	7.96		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-03-01T09:34:21.720  
 Event type : PgtRgt  
 : Uranus 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 : 3379627374867284352  
 2Mass ID (if available) : 06461815+2324058  
 ICRS Star Coord at Epoch: 06h 46m 18.16798s +23:24:05.73157s  
 RUWE (>1.4 is poor) : 1.00  
 K magnitude : 13.996  
 G magnitude : 15.209  
 RP magnitude : 14.809  
 BP magnitude : 15.449  
 DUPflag : 0  
 Distance (au) : 18.305  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -8.35  
 Sun-Target sep (deg) : 119.73  
 Sun-Moon sep (deg) : 83.55  
 B (ring opening deg) : 65.71  
 PA of pole (deg) : 74.60  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.499  
 C/A sky separation (km) : 19907.1  
 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	2036-03-01T08:10:24.374		28.09	4.94x	50861.68	-8.69		
lambda	I	2036-03-01T08:12:00.365		28.27	4.60x	50026.71	-8.69		
delta	I	2036-03-01T08:15:19.809		28.64	3.89x	48300.35	-8.63		
gamma	I	2036-03-01T08:16:38.498		28.79	3.61x	47622.60	-8.60		
eta	I	2036-03-01T08:17:30.465		28.88	3.43x	47176.12	-8.58		
beta	I	2036-03-01T08:20:29.684		29.20	2.79x	45643.52	-8.52		
alpha	I	2036-03-01T08:22:15.917		29.39	2.42x	44742.88	-8.48		
4	I	2036-03-01T08:26:33.151		29.84	1.50x	42572.68	-8.37		
5	I	2036-03-01T08:27:11.619		29.90	1.37x	42240.49	-8.34		
6	I	2036-03-01T08:28:04.594		29.99	1.18x	41807.97	-8.32		
Uranus	I	2036-03-01T09:04:00.041		33.07	-6.39	25504.50		-7.82	-8.18
Uranus	E	2036-03-01T10:03:50.202		35.49	-18.66	25213.59		20.21	21.08
6	E	2036-03-01T10:36:45.138		35.24	-25.11	41878.90	8.32		
5	E	2036-03-01T10:37:18.973		35.22	-25.22	42164.56	8.33		
4	E	2036-03-01T10:38:11.470		35.20	-25.39	42608.34	8.37		
alpha	E	2036-03-01T10:42:20.861		35.08	-26.18	44723.19	8.48		
beta	E	2036-03-01T10:44:12.101		35.02	-26.53	45664.12	8.51		
eta	E	2036-03-01T10:47:09.155		34.92	-27.09	47176.12	8.58		
gamma	E	2036-03-01T10:48:01.502		34.89	-27.25	47625.65	8.60		
delta	E	2036-03-01T10:49:19.877		34.84	-27.50	48300.35	8.62		
lambda	E	2036-03-01T10:52:39.427		34.71	-28.12	50026.71	8.68		
epsilon	E	2036-03-01T10:54:46.419		34.62	-28.52	51131.25	8.69		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-03-01T09:34:15.620  
 Event type : PgtRgt  
 : Uranus 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 : 3379627374867284352  
 2Mass ID (if available) : 06461815+2324058  
 ICRS Star Coord at Epoch: 06h 46m 18.16798s +23:24:05.73157s  
 RUWE (>1.4 is poor) : 1.00  
 K magnitude : 13.996  
 G magnitude : 15.209  
 RP magnitude : 14.809  
 BP magnitude : 15.449  
 DUPflag : 0  
 Distance (au) : 18.305  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -8.35  
 Sun-Target sep (deg) : 119.73  
 Sun-Moon sep (deg) : 83.50  
 B (ring opening deg) : 65.71  
 PA of pole (deg) : 74.60  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.481  
 C/A sky separation (km) : 19663.2  
 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	2036-03-01T08:09:58.279		24.58	5.46x	50863.21	-8.69		
lambda	I	2036-03-01T08:11:34.409		24.75	5.13x	50026.71	-8.69		
delta	I	2036-03-01T08:14:53.749		25.10	4.45x	48300.35	-8.63		
gamma	I	2036-03-01T08:16:12.383		25.23	4.19x	47622.62	-8.61		
eta	I	2036-03-01T08:17:04.314		25.32	4.01x	47176.12	-8.59		
beta	I	2036-03-01T08:20:03.372		25.62	3.40x	45643.58	-8.53		
alpha	I	2036-03-01T08:21:49.520		25.80	3.04x	44742.74	-8.49		
4	I	2036-03-01T08:26:06.424		26.21	2.17x	42572.38	-8.38		
5	I	2036-03-01T08:26:44.727		26.27	2.04x	42241.03	-8.35		
6	I	2036-03-01T08:27:37.705		26.35	1.86x	41807.76	-8.34		
Uranus	I	2036-03-01T09:03:16.613		29.19	-5.31	25499.78		-8.15	-8.53
Uranus	E	2036-03-01T10:04:22.022		31.47	-17.22	25206.92		20.41	21.30
6	E	2036-03-01T10:37:02.582		31.23	-23.27	41878.96	8.33		
5	E	2036-03-01T10:37:36.405		31.22	-23.37	42164.82	8.34		
4	E	2036-03-01T10:38:28.765		31.20	-23.53	42608.17	8.38		
alpha	E	2036-03-01T10:42:37.870		31.09	-24.28	44722.98	8.48		
beta	E	2036-03-01T10:44:29.054		31.03	-24.61	45664.24	8.52		
eta	E	2036-03-01T10:47:25.973		30.94	-25.13	47176.12	8.58		
gamma	E	2036-03-01T10:48:18.296		30.91	-25.28	47625.68	8.60		
delta	E	2036-03-01T10:49:36.630		30.87	-25.51	48300.35	8.62		
lambda	E	2036-03-01T10:52:56.116		30.75	-26.10	50026.71	8.68		
epsilon	E	2036-03-01T10:55:03.337		30.66	-26.47	51133.44	8.69		