

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-11-09T05:36:42.460
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3412954220843585536
 2Mass ID (if available) : 04452551+2217545

ICRS Star Coord at Epoch: 04h 45m 25.58170s +22:17:54.09656s

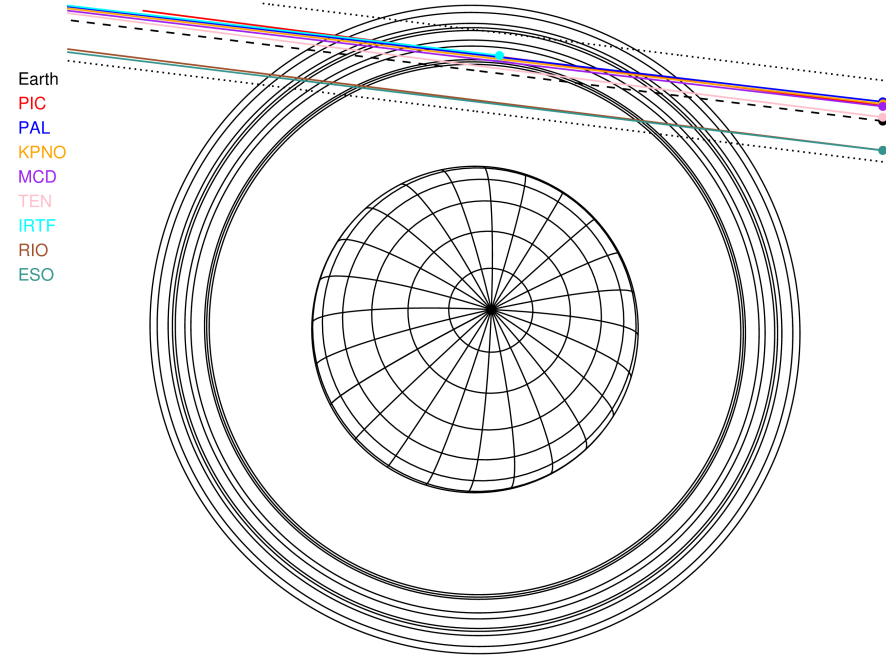
RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.691
 G magnitude : 18.225
 RP magnitude : 17.104
 BP magnitude : 19.586
 DUPflag : 0
 Distance (au) : 18.402
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.15
 Sun-Moon sep (deg) : 55.75
 B (ring opening deg) : 80.92
 PA of pole (deg) : -39.37

#	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



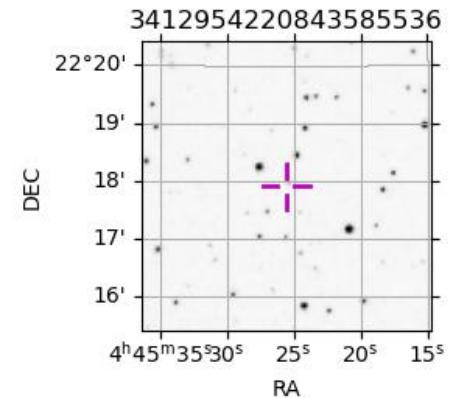
2028-11-09T05:36:42.4600 ra: 04 45 25.5817 s: +22 17 54.097 C/A 3.021'' PA 172.93 deg v_sky -20.47 km/s D 18.40 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2028-11-09T05:36:42 K14.69 G18.23 XRgt

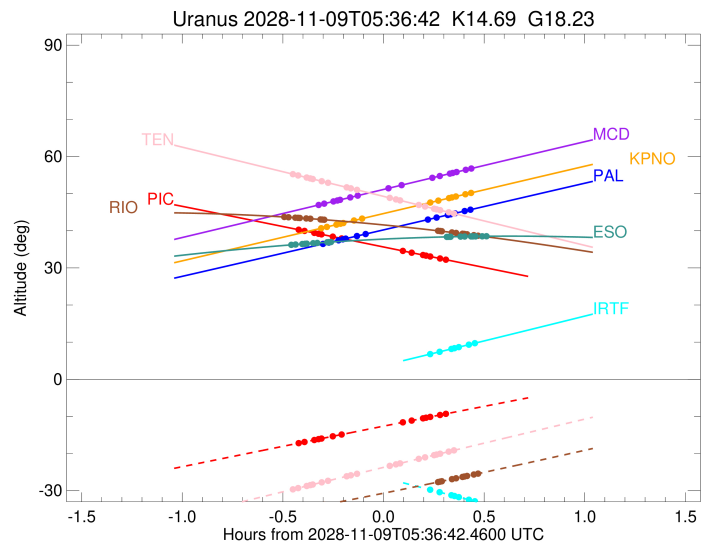
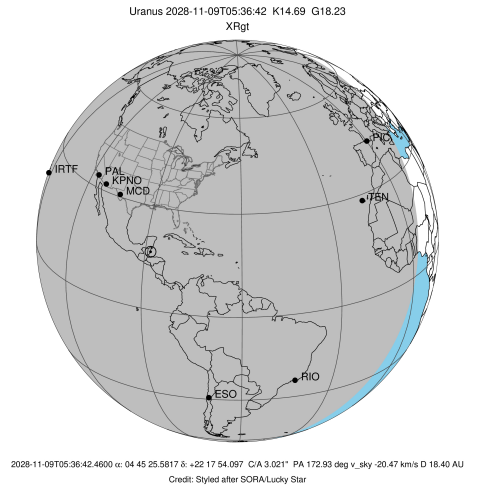


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++++		+++++++	NOV 09 05:11 - NOV 09 05:55	PnnRie
PAL	Palomar Mt (200")	33.4	243.1	+++++++		+++++++	NOV 09 05:19 - NOV 09 06:02	PnnRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++++		+++++++	NOV 09 05:18 - NOV 09 06:02	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++++		+++++++	NOV 09 05:17 - NOV 09 06:02	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++++		+++++++	NOV 09 05:10 - NOV 09 05:57	PnnRie
IRTF	Mauna Kea/IRTF	19.8	204.5			+++++++	NOV 09 05:50 - NOV 09 06:03	PnnRne
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++++		+++++++	NOV 09 05:07 - NOV 09 06:05	PnnRie
ESO	European Southern Obs	-29.3	289.3	+++++++		+++++++	NOV 09 05:09 - NOV 09 06:07	PnnRie
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 : 2028-11-09T05:32:57.310
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3412954220843585536
 2Mass ID (if available) : 04452551+2217545
 ICRS Star Coord at Epoch: 04h 45m 25.58170s +22:17:54.09656s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.691
 G magnitude : 18.225
 RP magnitude : 17.104
 BP magnitude : 19.586
 DUPflag : 0
 Distance (au) : 18.402
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.15
 Sun-Moon sep (deg) : 55.85
 B (ring opening deg) : 80.92
 PA of pole (deg) : -39.37
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.212
 C/A sky separation (km) : 42864.7
 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

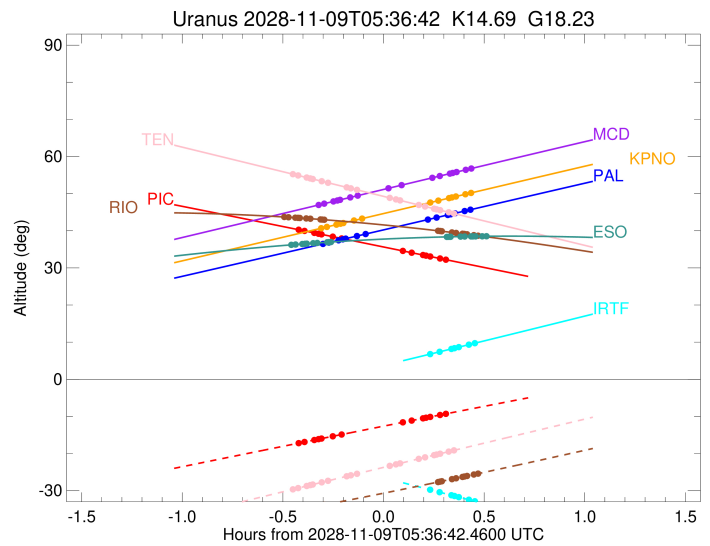
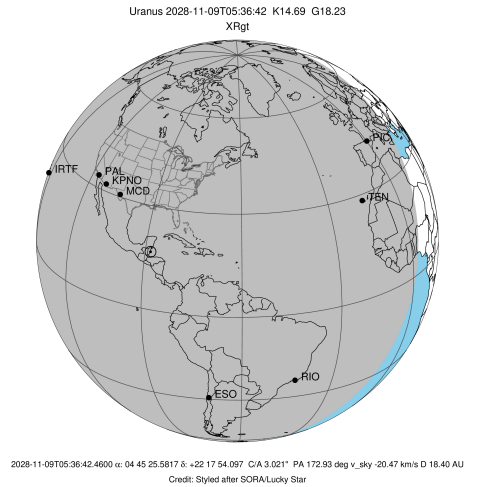


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2028-11-09T05:11:58.448		40.18	-17.11	50795.97	-10.94		
lambda	I	2028-11-09T05:13:10.705		39.96	-16.89	50026.71	-10.42		
delta	I	2028-11-09T05:16:06.341		39.42	-16.36	48300.35	-9.22		
gamma	I	2028-11-09T05:17:22.281		39.19	-16.13	47621.05	-8.66		
eta	I	2028-11-09T05:18:14.829		39.03	-15.97	47176.12	-8.27		
beta	I	2028-11-09T05:21:40.383		38.40	-15.35	45645.24	-6.61		
alpha	I	2028-11-09T05:24:15.071		37.93	-14.88	44725.55	-5.23		

No planet occultations

alpha	E	2028-11-09T05:42:23.699		34.59	-11.61	44708.47	5.23		
beta	E	2028-11-09T05:45:03.612		34.10	-11.14	45655.86	6.60		
eta	E	2028-11-09T05:48:27.857		33.47	-10.53	47176.12	8.25		
gamma	E	2028-11-09T05:49:20.617		33.31	-10.37	47622.12	8.65		
delta	E	2028-11-09T05:50:36.570		33.08	-10.15	48300.35	9.20		
lambda	E	2028-11-09T05:53:32.560		32.54	-9.63	50026.71	10.39		
epsilon	E	2028-11-09T05:55:19.209		32.21	-9.31	51170.83	10.92		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-11-09T05:40:16.260
 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 : 3412954220843585536
 2Mass ID (if available) : 04452551+2217545
 ICRS Star Coord at Epoch: 04h 45m 25.58170s +22:17:54.09656s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.691
 G magnitude : 18.225
 RP magnitude : 17.104
 BP magnitude : 19.586
 DUPflag : 0
 Distance (au) : 18.402
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.15
 Sun-Moon sep (deg) : 56.63
 B (ring opening deg) : 80.92
 PA of pole (deg) : -39.37
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.208
 C/A sky separation (km) : 42814.8
 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

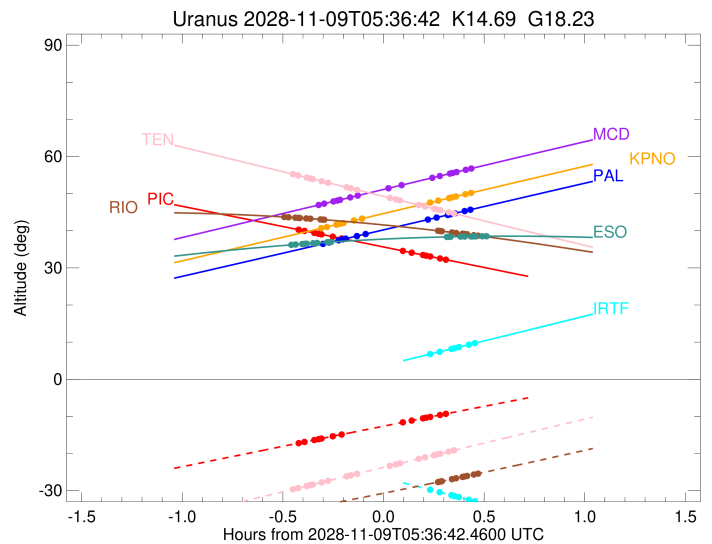
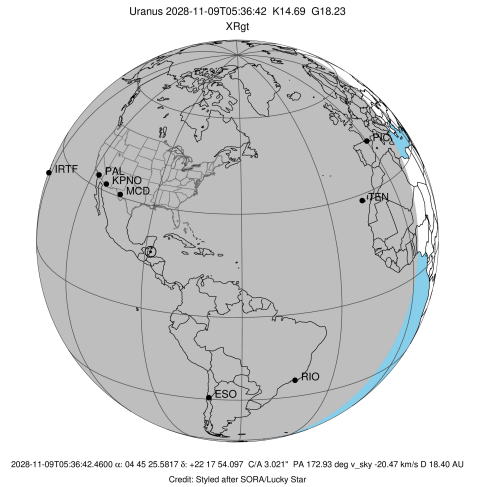


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2028-11-09T05:19:13.096		36.58	-56.22	50797.81	-10.96		
lambda	I	2028-11-09T05:20:25.355		36.83	-56.45	50026.71	-10.44		
delta	I	2028-11-09T05:23:20.386		37.44	-57.02	48300.35	-9.26		
gamma	I	2028-11-09T05:24:35.957		37.70	-57.27	47621.04	-8.71		
eta	I	2028-11-09T05:25:28.199		37.88	-57.44	47176.12	-8.32		
beta	I	2028-11-09T05:28:52.007		38.60	-58.10	45645.33	-6.68		
alpha	I	2028-11-09T05:31:24.512		39.13	-58.58	44725.33	-5.33		

No planet occultations

alpha	E	2028-11-09T05:49:51.912		43.00	-62.05	44707.94	5.34		
beta	E	2028-11-09T05:52:29.216		43.55	-62.53	45656.16	6.70		
eta	E	2028-11-09T05:55:50.980		44.25	-63.13	47176.12	8.34		
gamma	E	2028-11-09T05:56:43.223		44.44	-63.29	47622.16	8.73		
delta	E	2028-11-09T05:57:58.469		44.70	-63.51	48300.35	9.29		
lambda	E	2028-11-09T06:00:52.987		45.31	-64.03	50026.71	10.48		
epsilon	E	2028-11-09T06:02:39.317		45.68	-64.34	51176.43	11.00		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-11-09T05:40:06.140
 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 : 3412954220843585536
 2Mass ID (if available) : 04452551+2217545
 ICRS Star Coord at Epoch: 04h 45m 25.58170s +22:17:54.09656s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.691
 G magnitude : 18.225
 RP magnitude : 17.104
 BP magnitude : 19.586
 DUPflag : 0
 Distance (au) : 18.402
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.15
 Sun-Moon sep (deg) : 56.66
 B (ring opening deg) : 80.92
 PA of pole (deg) : -39.37
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.184
 C/A sky separation (km) : 42502.1
 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

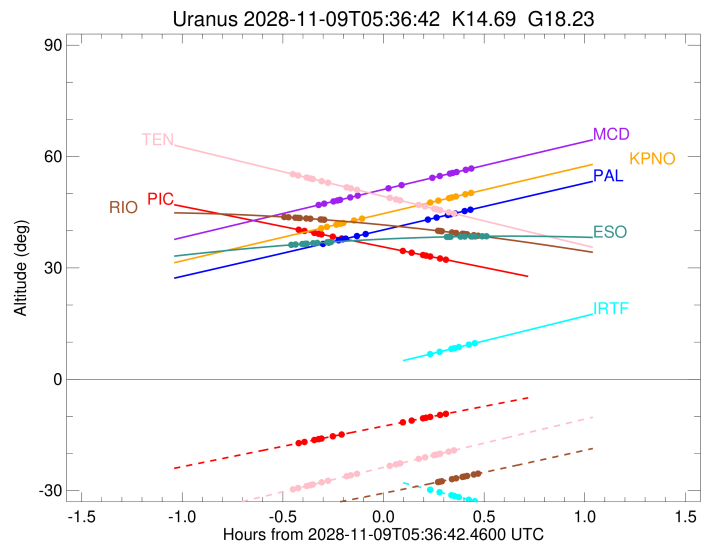
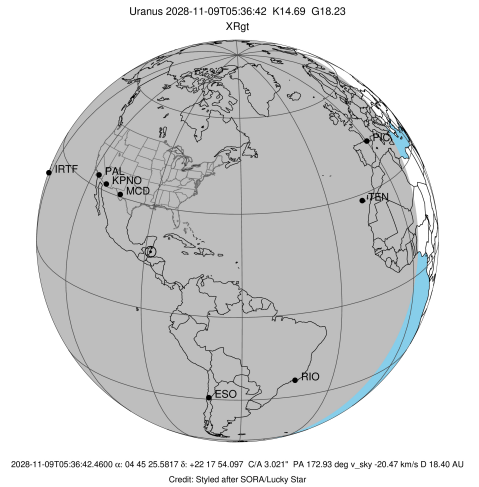


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2028-11-09T05:18:40.823		40.80	-60.75	50795.47	-11.19		
lambda	I	2028-11-09T05:19:51.340		41.05	-60.98	50026.71	-10.68		
delta	I	2028-11-09T05:22:41.878		41.65	-61.53	48300.35	-9.54		
gamma	I	2028-11-09T05:23:55.057		41.91	-61.76	47621.06	-9.02		
eta	I	2028-11-09T05:24:45.440		42.09	-61.92	47176.12	-8.64		
beta	I	2028-11-09T05:27:59.706		42.78	-62.54	45645.07	-7.10		
alpha	I	2028-11-09T05:30:20.893		43.28	-62.99	44726.20	-5.87		

No planet occultations

alpha	E	2028-11-09T05:50:34.803		47.59	-66.68	44707.11	5.88		
beta	E	2028-11-09T05:53:00.792		48.11	-67.10	45656.56	7.12		
eta	E	2028-11-09T05:56:13.037		48.79	-67.65	47176.12	8.66		
gamma	E	2028-11-09T05:57:03.427		48.97	-67.80	47622.22	9.04		
delta	E	2028-11-09T05:58:16.291		49.23	-68.00	48300.35	9.57		
lambda	E	2028-11-09T06:01:06.342		49.83	-68.47	50026.71	10.72		
epsilon	E	2028-11-09T06:02:50.884		50.21	-68.76	51181.04	11.22		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-11-09T05:39:45.600
 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 : 3412954220843585536
 2Mass ID (if available) : 04452551+2217545
 ICRS Star Coord at Epoch: 04h 45m 25.58170s +22:17:54.09656s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.691
 G magnitude : 18.225
 RP magnitude : 17.104
 BP magnitude : 19.586
 DUPflag : 0
 Distance (au) : 18.402
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.15
 Sun-Moon sep (deg) : 56.68
 B (ring opening deg) : 80.92
 PA of pole (deg) : -39.37
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.156
 C/A sky separation (km) : 42123.9
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

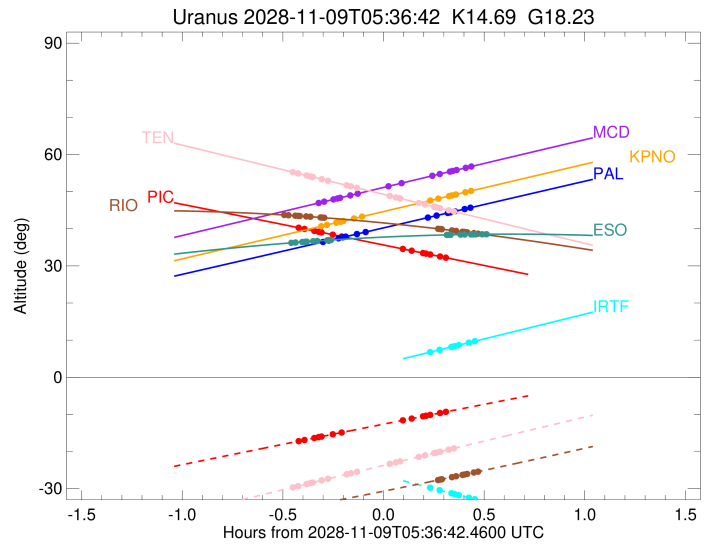
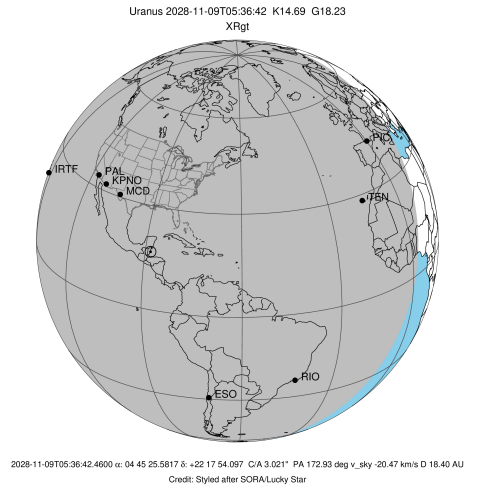


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2028-11-09T05:17:54.632		47.07	-66.95	50792.72	-11.45		
lambda	I	2028-11-09T05:19:03.172		47.32	-67.16	50026.71	-10.97		
delta	I	2028-11-09T05:21:48.689		47.91	-67.67	48300.35	-9.88		
gamma	I	2028-11-09T05:22:59.248		48.17	-67.88	47621.08	-9.37		
eta	I	2028-11-09T05:23:47.622		48.34	-68.02	47176.12	-9.02		
beta	I	2028-11-09T05:26:51.966		49.00	-68.57	45644.79	-7.58		
alpha	I	2028-11-09T05:29:02.324		49.47	-68.95	44727.16	-6.45		
4	I	2028-11-09T05:38:11.805		51.45	-70.51	42589.47	-1.18		

No planet occultations

4	E	2028-11-09T05:42:02.452		52.28	-71.13	42584.68	1.18		
alpha	E	2028-11-09T05:51:11.737		54.26	-72.53	44706.21	6.46		
beta	E	2028-11-09T05:53:26.907		54.74	-72.85	45657.02	7.59		
eta	E	2028-11-09T05:56:29.273		55.40	-73.27	47176.12	9.04		
gamma	E	2028-11-09T05:57:17.665		55.57	-73.38	47622.28	9.40		
delta	E	2028-11-09T05:58:27.927		55.82	-73.53	48300.35	9.90		
lambda	E	2028-11-09T06:01:13.002		56.41	-73.88	50026.71	11.00		
epsilon	E	2028-11-09T06:02:55.515		56.78	-74.09	51186.40	11.48		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-11-09T05:33:18.960
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 3412954220843585536
 2Mass ID (if available) : 04452551+2217545
 ICRS Star Coord at Epoch: 04h 45m 25.58170s +22:17:54.09656s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.691
 G magnitude : 18.225
 RP magnitude : 17.104
 BP magnitude : 19.586
 DUPflag : 0
 Distance (au) : 18.402
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.15
 Sun-Moon sep (deg) : 56.02
 B (ring opening deg) : 80.92
 PA of pole (deg) : -39.37
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.073
 C/A sky separation (km) : 41016.3
 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

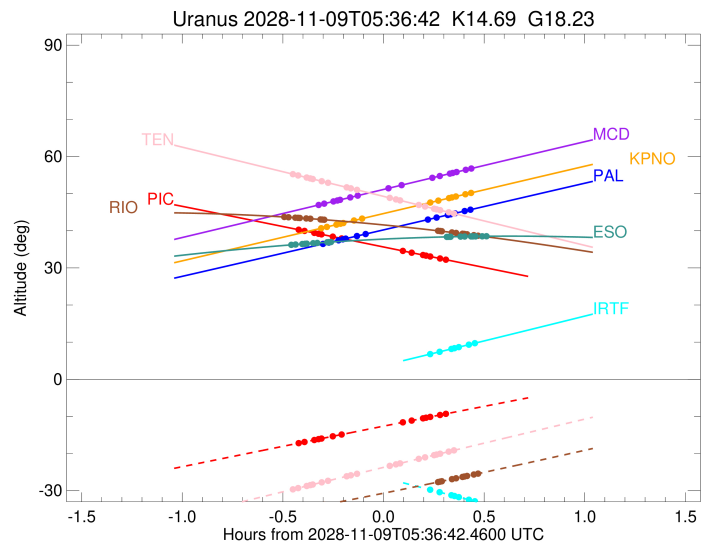
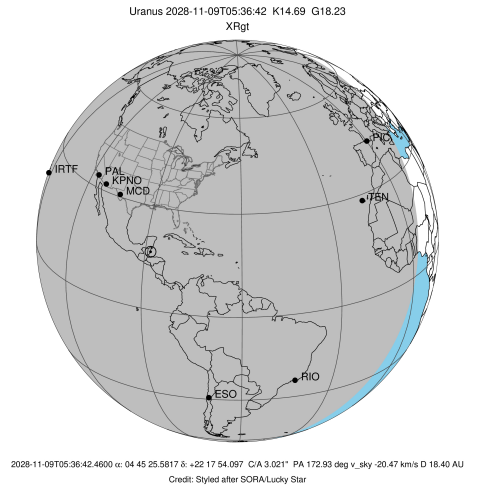


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2028-11-09T05:10:13.017		55.13	-29.54	50783.82	-12.15		
lambda	I	2028-11-09T05:11:16.598		54.90	-29.31	50026.71	-11.72		
delta	I	2028-11-09T05:13:50.124		54.33	-28.75	48300.35	-10.75		
gamma	I	2028-11-09T05:14:54.596		54.10	-28.51	47621.15	-10.31		
eta	I	2028-11-09T05:15:38.393		53.93	-28.35	47176.12	-10.01		
beta	I	2028-11-09T05:18:21.314		53.33	-27.75	45643.99	-8.79		
alpha	I	2028-11-09T05:20:10.619		52.93	-27.35	44729.82	-7.88		
4	I	2028-11-09T05:25:42.743		51.71	-26.14	42596.94	-4.88		
5	I	2028-11-09T05:26:53.803		51.45	-25.88	42265.74	-4.16		
6	I	2028-11-09T05:28:57.044		50.99	-25.43	41835.45	-2.94		

No planet occultations

6	E	2028-11-09T05:38:22.305		48.91	-23.37	41823.68	2.94		
5	E	2028-11-09T05:40:21.693		48.47	-22.94	42234.35	4.16		
4	E	2028-11-09T05:41:36.850		48.19	-22.66	42577.19	4.88		
alpha	E	2028-11-09T05:47:09.613		46.97	-21.45	44704.27	7.87		
beta	E	2028-11-09T05:49:04.089		46.55	-21.04	45658.04	8.78		
eta	E	2028-11-09T05:51:45.683		45.95	-20.45	47176.12	9.99		
gamma	E	2028-11-09T05:52:29.683		45.79	-20.29	47622.42	10.30		
delta	E	2028-11-09T05:53:34.156		45.56	-20.06	48300.35	10.73		
lambda	E	2028-11-09T05:56:08.004		44.99	-19.50	50026.71	11.69		
epsilon	E	2028-11-09T05:57:45.769		44.63	-19.15	51197.74	12.12		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-11-09T05:41:37.690
 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 : 3412954220843585536
 2Mass ID (if available) : 04452551+2217545
 ICRS Star Coord at Epoch: 04h 45m 25.58170s +22:17:54.09656s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.691
 G magnitude : 18.225
 RP magnitude : 17.104
 BP magnitude : 19.586
 DUPflag : 0
 Distance (au) : 18.402
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.15
 Sun-Moon sep (deg) : 56.29
 B (ring opening deg) : 80.92
 PA of pole (deg) : -39.37
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.227
 C/A sky separation (km) : 43066.2
 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

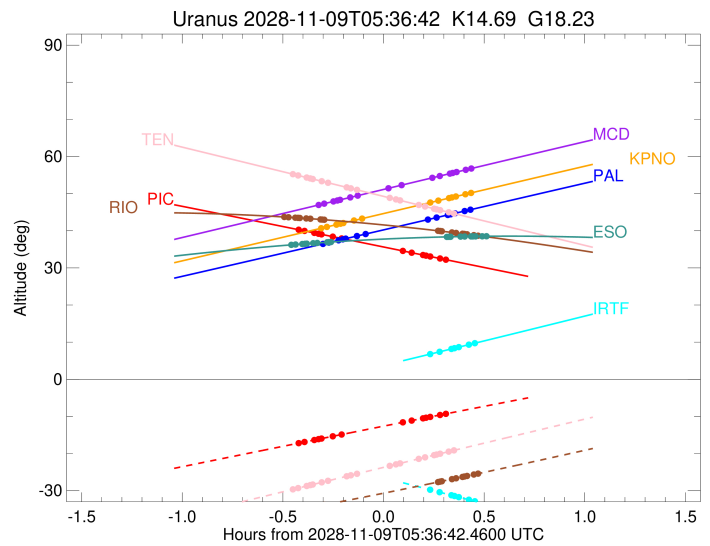
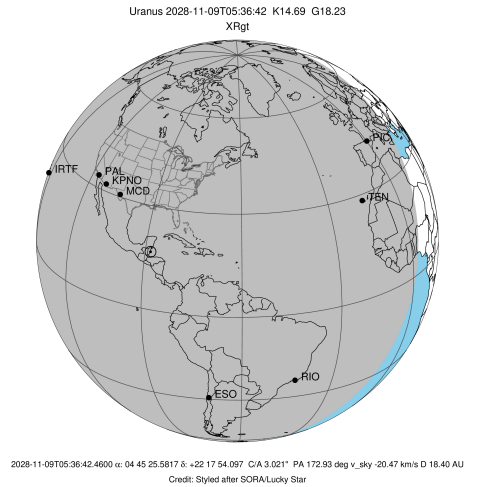


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2028-11-09T05:20:38.414		0.24x	-22.81	50799.86	-10.66		
lambda	I	2028-11-09T05:21:53.038		0.51x	-23.10	50026.71	-10.13		
delta	I	2028-11-09T05:24:54.047		1.16x	-23.80	48300.35	-8.92		
gamma	I	2028-11-09T05:26:12.627		1.45x	-24.10	47621.03	-8.36		
eta	I	2028-11-09T05:27:07.149		1.64x	-24.31	47176.12	-7.96		
beta	I	2028-11-09T05:30:42.229		2.42x	-25.14	45645.56	-6.26		
alpha	I	2028-11-09T05:33:28.015		3.02x	-25.78	44724.54	-4.81		

No planet occultations

alpha	E	2028-11-09T05:50:32.120		6.76	-29.74	44708.66	4.82		
beta	E	2028-11-09T05:53:22.683		7.38	-30.41	45655.84	6.27		
eta	E	2028-11-09T05:56:55.547		8.16	-31.23	47176.12	7.98		
gamma	E	2028-11-09T05:57:50.028		8.36	-31.44	47622.12	8.39		
delta	E	2028-11-09T05:59:08.210		8.65	-31.75	48300.35	8.96		
lambda	E	2028-11-09T06:02:08.527		9.32	-32.45	50026.71	10.17		
epsilon	E	2028-11-09T06:03:57.581		9.72	-32.87	51173.06	10.71		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-11-09T05:35:41.020
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 3412954220843585536
 2Mass ID (if available) : 04452551+2217545
 ICRS Star Coord at Epoch: 04h 45m 25.58170s +22:17:54.09656s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.691
 G magnitude : 18.225
 RP magnitude : 17.104
 BP magnitude : 19.586
 DUPflag : 0
 Distance (au) : 18.402
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.15
 Sun-Moon sep (deg) : 56.17
 B (ring opening deg) : 80.92
 PA of pole (deg) : -39.37
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.672
 C/A sky separation (km) : 35659.6
 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

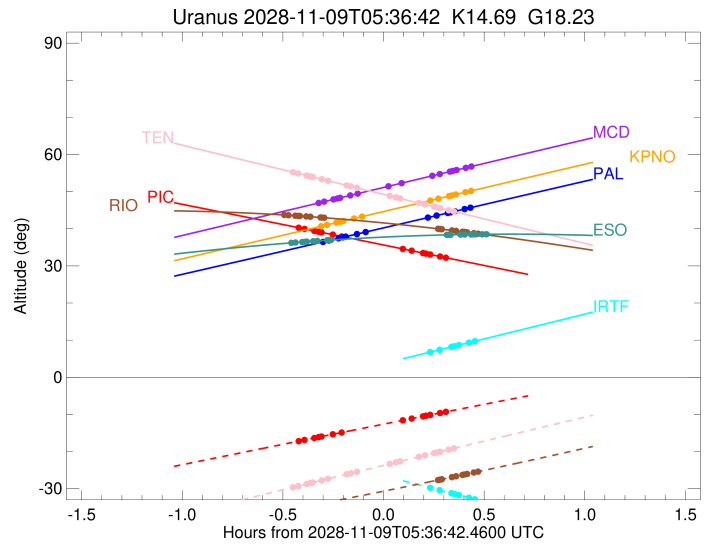
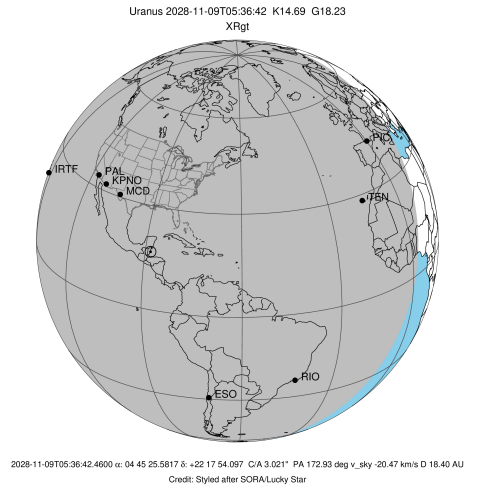


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2028-11-09T05:07:34.427		43.69	-35.77	50760.38	-14.82		
lambda	I	2028-11-09T05:08:24.415		43.64	-35.63	50026.71	-14.56		
delta	I	2028-11-09T05:10:25.314		43.52	-35.29	48300.35	-13.98		
gamma	I	2028-11-09T05:11:14.298		43.48	-35.16	47621.52	-13.73		
eta	I	2028-11-09T05:11:46.944		43.44	-35.07	47176.12	-13.56		
beta	I	2028-11-09T05:13:42.909		43.32	-34.74	45642.10	-12.89		
alpha	I	2028-11-09T05:14:54.144		43.25	-34.54	44737.21	-12.44		
4	I	2028-11-09T05:17:54.304		43.05	-34.02	42607.49	-11.21		
5	I	2028-11-09T05:18:22.246		43.02	-33.94	42289.08	-10.98		
6	I	2028-11-09T05:19:03.430		42.97	-33.82	41851.67	-10.67		

No planet occultations

6	E	2028-11-09T05:52:54.171		40.00	-27.70	41809.21	10.67		
5	E	2028-11-09T05:53:31.510		39.94	-27.59	42206.65	10.98		
4	E	2028-11-09T05:54:03.423		39.88	-27.49	42562.28	11.20		
alpha	E	2028-11-09T05:57:04.054		39.56	-26.92	44697.08	12.43		
beta	E	2028-11-09T05:58:20.307		39.42	-26.67	45662.67	12.89		
eta	E	2028-11-09T06:00:14.765		39.21	-26.31	47176.12	13.55		
gamma	E	2028-11-09T06:00:47.560		39.14	-26.21	47623.22	13.72		
delta	E	2028-11-09T06:01:36.460		39.05	-26.05	48300.35	13.97		
lambda	E	2028-11-09T06:03:37.462		38.82	-25.66	50026.71	14.55		
epsilon	E	2028-11-09T06:05:01.418		38.66	-25.40	51264.05	14.81		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2028-11-09T05:38:00.300
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 3412954220843585536
 2Mass ID (if available) : 04452551+2217545
 ICRS Star Coord at Epoch: 04h 45m 25.58170s +22:17:54.09656s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 14.691
 G magnitude : 18.225
 RP magnitude : 17.104
 BP magnitude : 19.586
 DUPflag : 0
 Distance (au) : 18.402
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.47
 Sun-Target sep (deg) : 154.15
 Sun-Moon sep (deg) : 56.36
 B (ring opening deg) : 80.92
 PA of pole (deg) : -39.37
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.655
 C/A sky separation (km) : 35435.8
 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	2028-11-09T05:09:40.542		36.24	-42.75	50760.05	-14.89		
lambda	I	2028-11-09T05:10:30.277		36.30	-42.70	50026.71	-14.63		
delta	I	2028-11-09T05:12:30.528		36.43	-42.59	48300.35	-14.07		
gamma	I	2028-11-09T05:13:19.206		36.49	-42.55	47621.53	-13.82		
eta	I	2028-11-09T05:13:51.633		36.52	-42.52	47176.12	-13.65		
beta	I	2028-11-09T05:15:46.708		36.65	-42.40	45642.07	-13.01		
alpha	I	2028-11-09T05:16:57.279		36.72	-42.33	44737.36	-12.56		
4	I	2028-11-09T05:19:55.338		36.90	-42.14	42607.67	-11.36		
5	I	2028-11-09T05:20:22.862		36.93	-42.11	42289.48	-11.15		
6	I	2028-11-09T05:21:03.419		36.97	-42.07	41851.96	-10.85		

No planet occultations

6	E	2028-11-09T05:55:31.935		38.35	-39.15	41808.77	10.86		
5	E	2028-11-09T05:56:08.574		38.37	-39.09	42205.63	11.16		
4	E	2028-11-09T05:56:40.030		38.38	-39.04	42561.69	11.38		
alpha	E	2028-11-09T05:59:38.277		38.43	-38.73	44696.76	12.58		
beta	E	2028-11-09T06:00:53.742		38.45	-38.59	45662.90	13.02		
eta	E	2028-11-09T06:02:47.083		38.48	-38.39	47176.12	13.67		
gamma	E	2028-11-09T06:03:19.596		38.49	-38.33	47623.27	13.84		
delta	E	2028-11-09T06:04:08.087		38.50	-38.24	48300.35	14.09		
lambda	E	2028-11-09T06:06:08.175		38.52	-38.02	50026.71	14.66		
epsilon	E	2028-11-09T06:07:31.817		38.53	-37.87	51267.88	14.91		