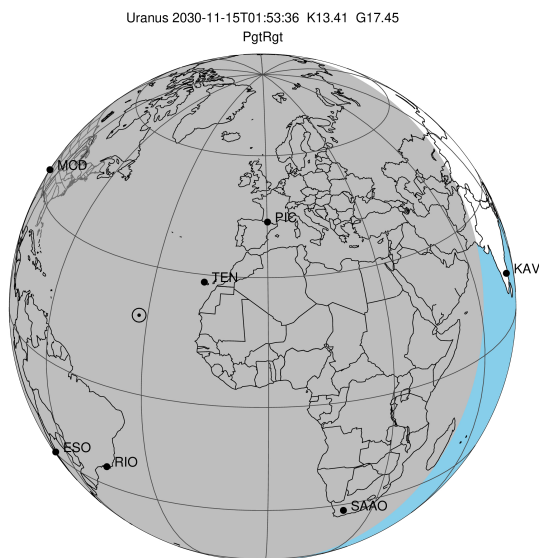


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-11-15T01:53:36.280
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3416343194854408960
 2Mass ID (if available) : 05230772+2315170

ICRS Star Coord at Epoch: 05h 23m 07.73760s +23:15:17.34011s

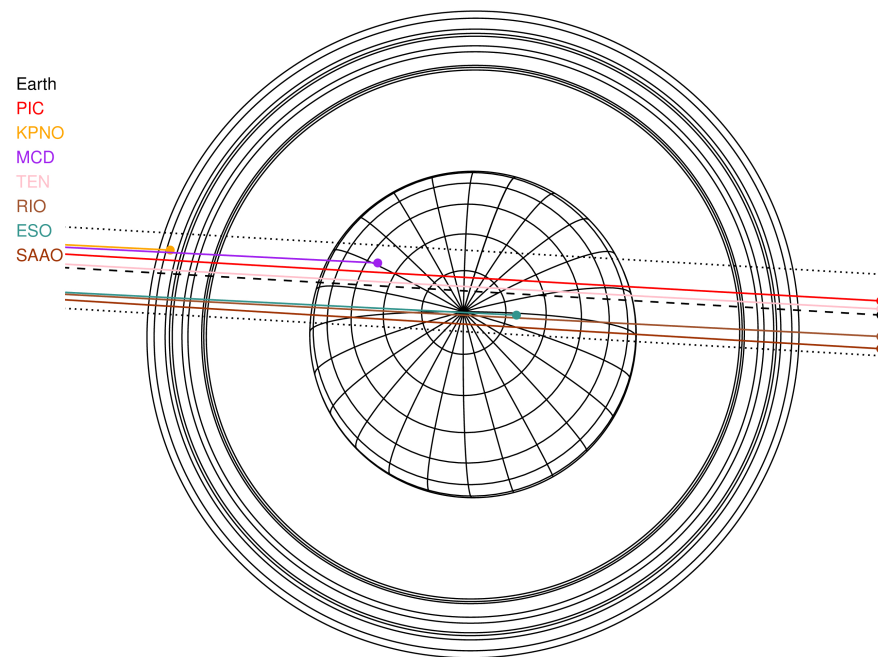
RUWE (>1.4 is poor) : 1.05
 K magnitude : 13.408
 G magnitude : 17.454
 RP magnitude : 16.307
 BP magnitude : 18.882
 DUPflag : 0
 Distance (au) : 18.291
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.77
 Sun-Moon sep (deg) : 24.46
 B (ring opening deg) : 81.28
 PA of pole (deg) : 22.68

#	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



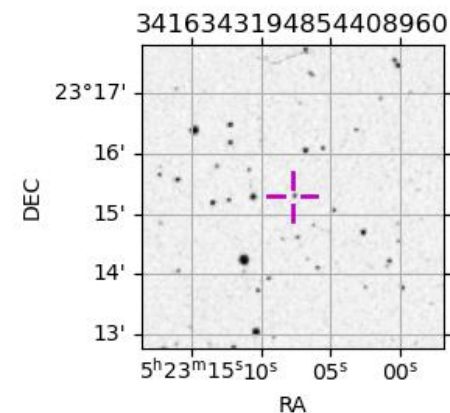
2030-11-15T01:53:36.2800 ex: 05 23 07.7376 s: +23 15 17.340 C/A 0.515° PA 176.67 deg v_sky -19.65 km/s D 18.29 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2030-11-15T01:53:36 K13.41 G17.45 PgtRgt

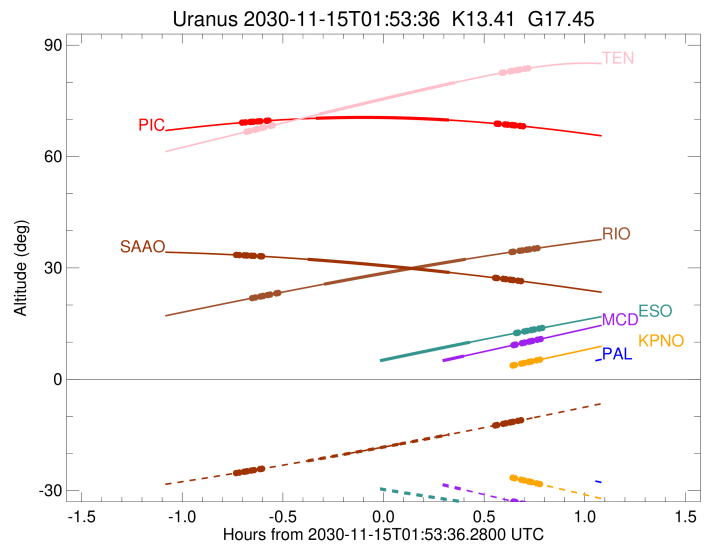
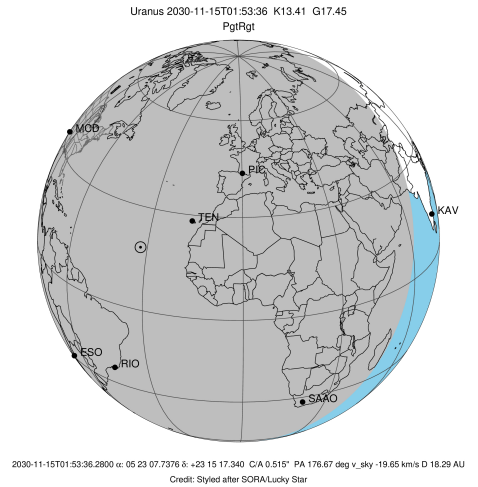


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	NOV 15 01:11 - NOV 15 02:35	PieRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4			++	NOV 15 02:39 - NOV 15 02:40	PnnRne
MCD	McDonald Obs. 2.7m	30.7	256.0		+	+++++	NOV 15 02:17 - NOV 15 02:40	PneRne
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	NOV 15 01:12 - NOV 15 02:36	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++	+ +	+++++	NOV 15 01:14 - NOV 15 02:39	PieRie
ESO	European Southern Obs	-29.3	289.3		+	+++++	NOV 15 02:19 - NOV 15 02:41	PneRne
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++	+ +	+++++	NOV 15 01:09 - NOV 15 02:34	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

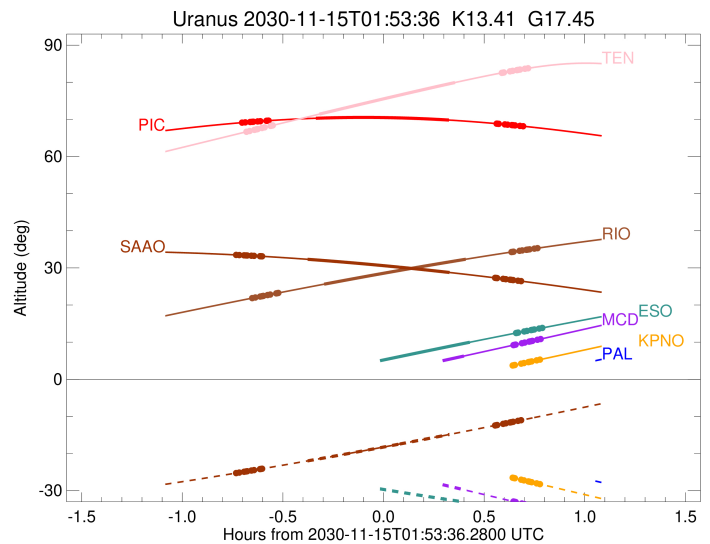
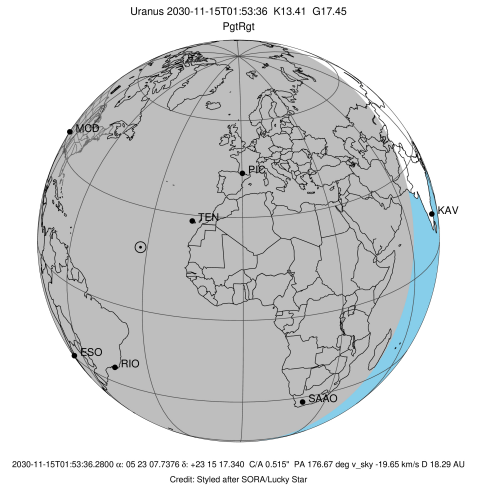


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-11-15T01:53:24.680
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3416343194854408960
 2Mass ID (if available) : 05230772+2315170
 ICRS Star Coord at Epoch: 05h 23m 07.73760s +23:15:17.34011s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 13.408
 G magnitude : 17.454
 RP magnitude : 16.307
 BP magnitude : 18.882
 DUPflag : 0
 Distance (au) : 18.291
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.77
 Sun-Moon sep (deg) : 24.82
 B (ring opening deg) : 81.28
 PA of pole (deg) : 22.68
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.668
 C/A sky separation (km) : 8858.2
 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



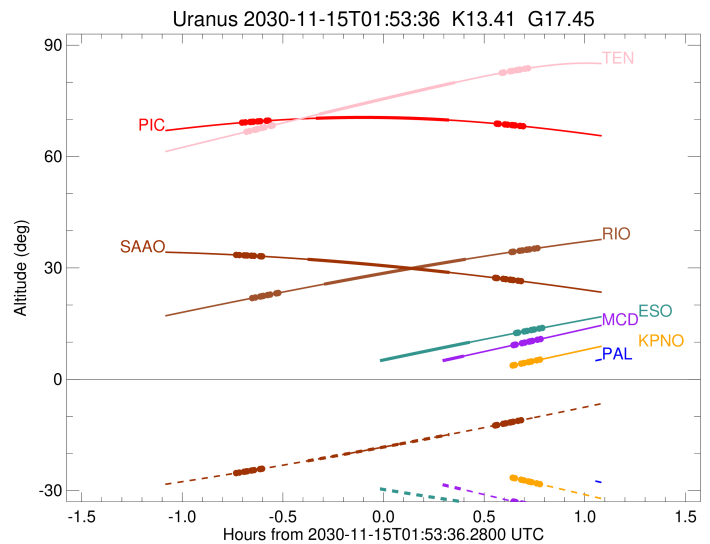
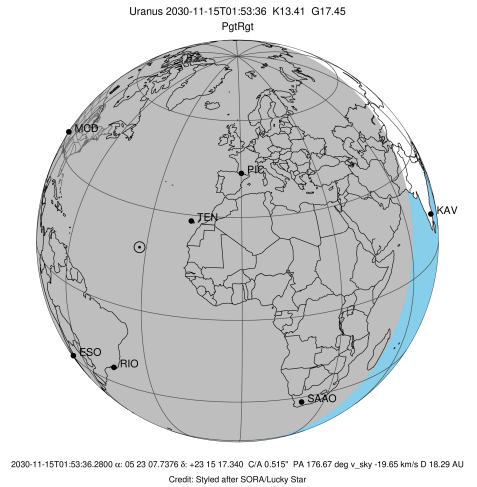
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-11-15T01:11:37.719		69.15	-59.43	50935.28	-19.73		
lambda	I	2030-11-15T01:12:23.841		69.21	-59.33	50026.71	-19.69		
delta	I	2030-11-15T01:13:51.553		69.31	-59.15	48300.35	-19.67		
gamma	I	2030-11-15T01:14:25.847		69.35	-59.07	47625.94	-19.66		
eta	I	2030-11-15T01:14:48.731		69.38	-59.02	47176.12	-19.65		
beta	I	2030-11-15T01:16:06.100		69.46	-58.85	45656.41	-19.63		
alpha	I	2030-11-15T01:16:55.432		69.52	-58.74	44688.21	-19.61		
4	I	2030-11-15T01:18:44.678		69.63	-58.50	42548.37	-19.57		
5	I	2030-11-15T01:19:04.661		69.65	-58.46	42157.84	-19.56		
6	I	2030-11-15T01:19:22.987		69.67	-58.42	41800.10	-19.55		
Uranus	I	2030-11-15T01:33:25.493		70.31	-56.45	25553.25		-0.86	-0.90
Uranus	E	2030-11-15T02:13:07.635		69.83	-50.27	25252.89		6.31	6.61
6	E	2030-11-15T02:27:20.747		68.86	-47.89	41862.21	19.56		
5	E	2030-11-15T02:27:43.782		68.83	-47.82	42314.29	19.58		
4	E	2030-11-15T02:27:58.973		68.80	-47.78	42608.22	19.59		
alpha	E	2030-11-15T02:29:48.330		68.65	-47.47	44752.37	19.63		
beta	E	2030-11-15T02:30:34.425		68.59	-47.34	45657.94	19.64		
eta	E	2030-11-15T02:31:51.666		68.47	-47.12	47176.12	19.67		
gamma	E	2030-11-15T02:32:14.666		68.44	-47.05	47628.54	19.67		
delta	E	2030-11-15T02:32:48.804		68.39	-46.96	48300.35	19.68		
lambda	E	2030-11-15T02:34:16.454		68.25	-46.71	50026.71	19.71		
epsilon	E	2030-11-15T02:35:29.491		68.14	-46.50	51466.80	19.74		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-11-15T01:57:49.750
 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 : 3416343194854408960
 2Mass ID (if available) : 05230772+2315170
 ICRS Star Coord at Epoch: 05h 23m 07.73760s +23:15:17.34011s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 13.408
 G magnitude : 17.454
 RP magnitude : 16.307
 BP magnitude : 18.882
 DUPflag : 0
 Distance (au) : 18.291
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.77
 Sun-Moon sep (deg) : 25.13
 B (ring opening deg) : 81.28
 PA of pole (deg) : 22.68
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.815
 C/A sky separation (km) : 10807.3
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



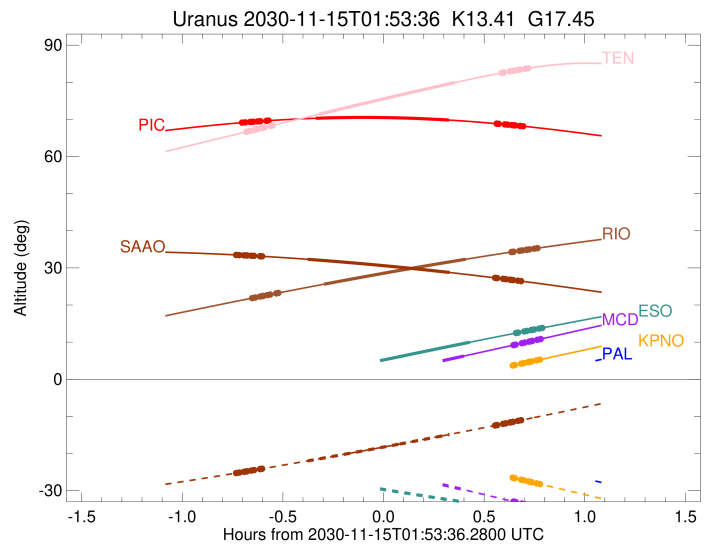
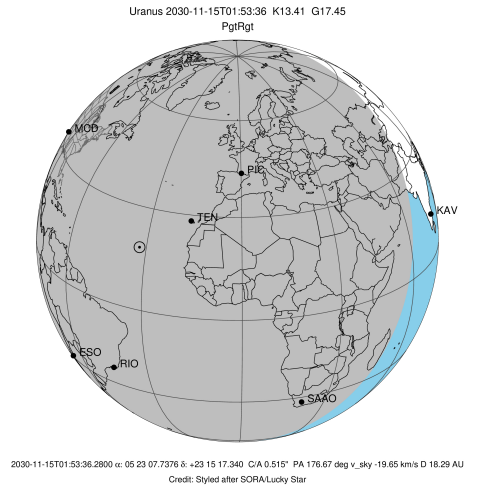
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-11-15T01:15:14.981	-10.40x	-10.49	50950.86	-19.05			
lambda	I	2030-11-15T01:16:03.589	-10.26x	-10.65	50026.71	-19.00			
delta	I	2030-11-15T01:17:34.506	-9.99x	-10.97	48300.35	-18.97			
gamma	I	2030-11-15T01:18:10.053	-9.89x	-11.09	47626.19	-18.96			
eta	I	2030-11-15T01:18:33.800	-9.82x	-11.17	47176.12	-18.95			
beta	I	2030-11-15T01:19:54.121	-9.59x	-11.44	45655.44	-18.91			
alpha	I	2030-11-15T01:20:45.236	-9.44x	-11.62	44689.02	-18.89			
4	I	2030-11-15T01:22:38.640	-9.11x	-12.01	42550.47	-18.84			
5	I	2030-11-15T01:22:59.443	-9.05x	-12.08	42159.12	-18.82			
6	I	2030-11-15T01:23:18.616	-8.99x	-12.15	41799.04	-18.81			
Uranus	I	2030-11-15T01:38:01.431	-6.38x	-15.19	25558.94			-0.09	-0.09
Uranus	E	2030-11-15T02:17:16.097	0.87x	-23.39	25208.98			6.76	7.08
6	E	2030-11-15T02:32:07.454	3.72x	-26.53	41860.76	18.93			
5	E	2030-11-15T02:32:31.288	3.79x	-26.61	42313.72	18.94			
4	E	2030-11-15T02:32:47.089	3.84x	-26.67	42609.26	18.96			
alpha	E	2030-11-15T02:34:39.937	4.21x	-27.06	44752.42	19.02			
beta	E	2030-11-15T02:35:27.445	4.36x	-27.23	45657.21	19.04			
eta	E	2030-11-15T02:36:47.110	4.62x	-27.51	47176.12	19.09			
gamma	E	2030-11-15T02:37:10.817	4.69x	-27.60	47628.71	19.10			
delta	E	2030-11-15T02:37:45.973	4.81x	-27.72	48300.35	19.11			
lambda	E	2030-11-15T02:39:16.209	5.10	-28.04	50026.71	19.15			
epsilon	E	2030-11-15T02:40:31.763	5.34	-28.30	51474.70	19.20			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-11-15T01:58:04.370
 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 : 3416343194854408960
 2Mass ID (if available) : 05230772+2315170
 ICRS Star Coord at Epoch: 05h 23m 07.73760s +23:15:17.34011s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 13.408
 G magnitude : 17.454
 RP magnitude : 16.307
 BP magnitude : 18.882
 DUPflag : 0
 Distance (au) : 18.291
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.77
 Sun-Moon sep (deg) : 25.19
 B (ring opening deg) : 81.28
 PA of pole (deg) : 22.68
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.787
 C/A sky separation (km) : 10440.7
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



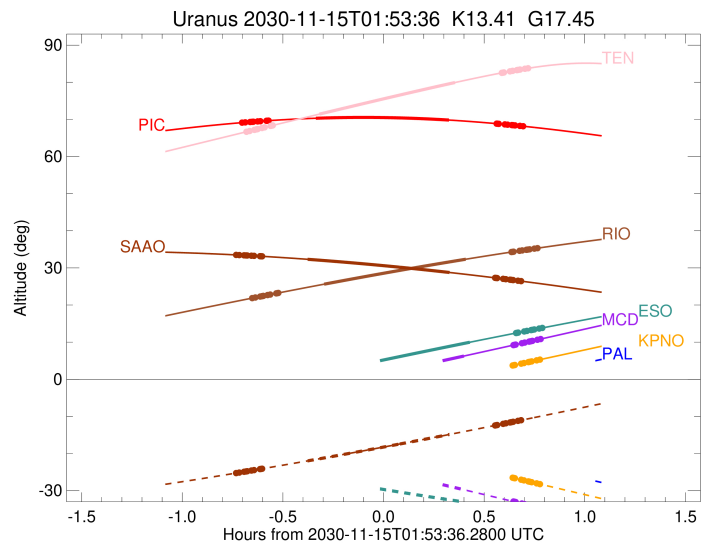
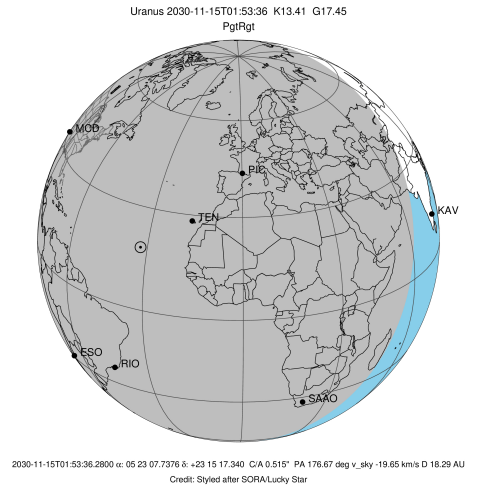
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-11-15T01:15:32.049	-5.65x	-16.55	50948.46	-19.12			
lambda	I	2030-11-15T01:16:20.339	-5.50x	-16.72	50026.71	-19.08			
delta	I	2030-11-15T01:17:50.888	-5.23x	-17.04	48300.35	-19.05			
gamma	I	2030-11-15T01:18:26.291	-5.12x	-17.16	47626.15	-19.04			
eta	I	2030-11-15T01:18:49.936	-5.04x	-17.24	47176.12	-19.03			
beta	I	2030-11-15T01:20:09.905	-4.80x	-17.52	45655.59	-18.99			
alpha	I	2030-11-15T01:21:00.810	-4.64x	-17.70	44688.88	-18.98			
4	I	2030-11-15T01:22:53.707	-4.29x	-18.10	42550.13	-18.92			
5	I	2030-11-15T01:23:14.407	-4.22x	-18.17	42158.90	-18.91			
6	I	2030-11-15T01:23:33.470	-4.16x	-18.24	41799.20	-18.90			
Uranus	I	2030-11-15T01:38:10.461	-1.41x	-21.34	25558.62	-19.12		-0.22	-0.23
Uranus	E	2030-11-15T02:17:36.932	6.26	-29.77	25218.29	-19.08		6.67	6.98
6	E	2030-11-15T02:32:21.915	9.20	-32.94	41861.10	-19.02	19.02		
5	E	2030-11-15T02:32:45.623	9.28	-33.02	42313.87	-19.04	19.04		
4	E	2030-11-15T02:33:01.320	9.34	-33.08	42609.02	-19.05	19.05		
alpha	E	2030-11-15T02:34:53.632	9.71	-33.48	44752.42	-19.11	19.11		
beta	E	2030-11-15T02:35:40.925	9.87	-33.65	45657.38	-19.13	19.13		
eta	E	2030-11-15T02:37:00.214	10.14	-33.94	47176.12	-19.17	19.17		
gamma	E	2030-11-15T02:37:23.812	10.22	-34.02	47628.67	-19.18	19.18		
delta	E	2030-11-15T02:37:58.813	10.33	-34.15	48300.35	-19.20	19.20		
lambda	E	2030-11-15T02:39:28.653	10.64	-34.47	50026.71	-19.23	19.23		
epsilon	E	2030-11-15T02:40:43.784	10.89	-34.74	51472.79	-19.28	19.28		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-11-15T01:54:48.930
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3416343194854408960
 2Mass ID (if available) : 05230772+2315170
 ICRS Star Coord at Epoch: 05h 23m 07.73760s +23:15:17.34011s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 13.408
 G magnitude : 17.454
 RP magnitude : 16.307
 BP magnitude : 18.882
 DUPflag : 0
 Distance (au) : 18.291
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.77
 Sun-Moon sep (deg) : 25.02
 B (ring opening deg) : 81.28
 PA of pole (deg) : 22.68
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.560
 C/A sky separation (km) : 7435.4
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



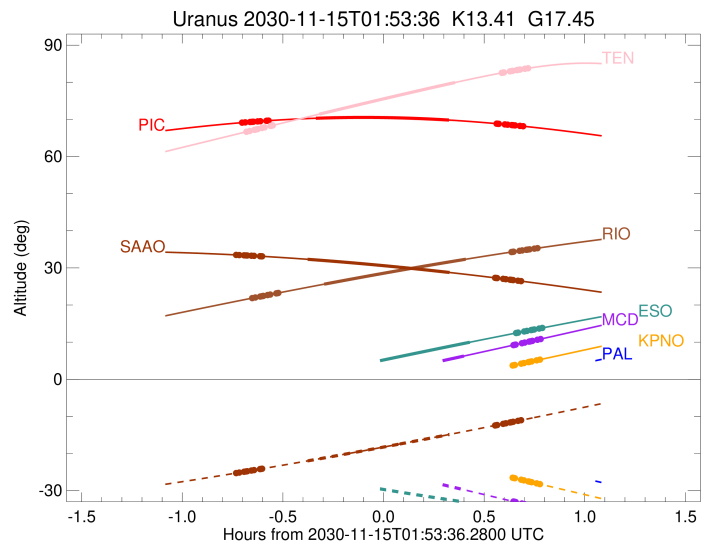
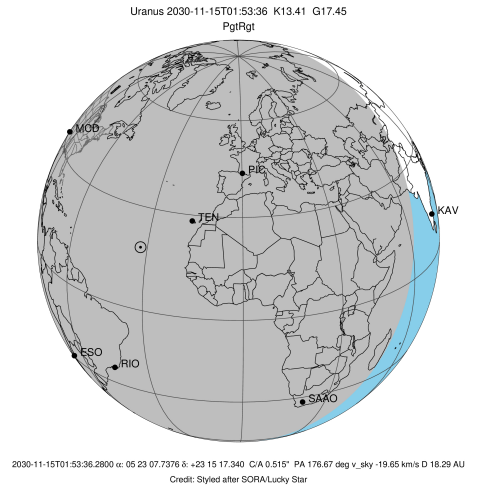
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-11-15T01:12:56.647		66.71	-79.03	50926.40	-19.85		
lambda	I	2030-11-15T01:13:42.031		66.88	-78.95	50026.71	-19.82		
delta	I	2030-11-15T01:15:09.166		67.20	-78.79	48300.35	-19.80		
gamma	I	2030-11-15T01:15:43.233		67.32	-78.72	47625.79	-19.80		
eta	I	2030-11-15T01:16:05.948		67.41	-78.68	47176.12	-19.79		
beta	I	2030-11-15T01:17:22.726		67.69	-78.52	45656.98	-19.78		
alpha	I	2030-11-15T01:18:11.732		67.87	-78.42	44687.76	-19.77		
4	I	2030-11-15T01:20:00.134		68.26	-78.19	42547.13	-19.74		
5	I	2030-11-15T01:20:19.925		68.33	-78.14	42157.18	-19.73		
6	I	2030-11-15T01:20:38.023		68.40	-78.10	41800.79	-19.72		
Uranus	I	2030-11-15T01:34:29.130		71.42	-76.02	25544.90		-1.34	-1.40
Uranus	E	2030-11-15T02:14:54.521		79.93	-68.38	25288.53		5.93	6.21
6	E	2030-11-15T02:28:53.919		82.54	-65.49	41863.47	19.77		
5	E	2030-11-15T02:29:16.688		82.61	-65.41	42314.70	19.78		
4	E	2030-11-15T02:29:31.636		82.65	-65.35	42607.24	19.79		
alpha	E	2030-11-15T02:31:19.968		82.95	-64.98	44752.28	19.81		
beta	E	2030-11-15T02:32:05.666		83.08	-64.81	45658.62	19.83		
eta	E	2030-11-15T02:33:22.166		83.28	-64.55	47176.12	19.85		
gamma	E	2030-11-15T02:33:44.953		83.34	-64.47	47628.38	19.85		
delta	E	2030-11-15T02:34:18.798		83.42	-64.35	48300.35	19.86		
lambda	E	2030-11-15T02:35:45.696		83.64	-64.04	50026.71	19.88		
epsilon	E	2030-11-15T02:36:57.730		83.81	-63.79	51458.88	19.90		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-11-15T01:57:04.430
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : 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 : 3416343194854408960
 2Mass ID (if available) : 05230772+2315170
 ICRS Star Coord at Epoch: 05h 23m 07.73760s +23:15:17.34011s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 13.408
 G magnitude : 17.454
 RP magnitude : 16.307
 BP magnitude : 18.882
 DUPflag : 0
 Distance (au) : 18.291
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.77
 Sun-Moon sep (deg) : 25.10
 B (ring opening deg) : 81.28
 PA of pole (deg) : 22.68
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.222
 C/A sky separation (km) : 2942.6
 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	2030-11-15T01:14:40.276		21.90	-44.11	50898.07	-19.91		
lambda	I	2030-11-15T01:15:24.056		22.03	-44.19	50026.71	-19.90		
delta	I	2030-11-15T01:16:50.794		22.29	-44.34	48300.35	-19.90		
gamma	I	2030-11-15T01:17:24.712		22.39	-44.40	47625.30	-19.90		
eta	I	2030-11-15T01:17:47.281		22.46	-44.44	47176.12	-19.90		
beta	I	2030-11-15T01:19:03.513		22.68	-44.57	45658.91	-19.90		
alpha	I	2030-11-15T01:19:52.354		22.83	-44.65	44686.50	-19.90		
4	I	2030-11-15T01:21:40.078		23.15	-44.83	42543.26	-19.90		
5	I	2030-11-15T01:21:59.620		23.20	-44.87	42155.58	-19.90		
6	I	2030-11-15T01:22:17.347		23.26	-44.90	41803.32	-19.90		
Uranus	I	2030-11-15T01:35:54.930		25.62	-46.14	25496.52		-2.83	-2.96
Uranus	E	2030-11-15T02:18:06.717		32.33	-48.52	25391.54		4.65	4.87
6	E	2030-11-15T02:31:46.791		34.28	-48.76	41867.07	20.00		
5	E	2030-11-15T02:32:09.194		34.33	-48.76	42315.25	20.00		
4	E	2030-11-15T02:32:23.740		34.36	-48.77	42603.97	20.00		
alpha	E	2030-11-15T02:34:11.119		34.60	-48.78	44751.76	20.01		
beta	E	2030-11-15T02:34:56.521		34.71	-48.78	45660.69	20.01		
eta	E	2030-11-15T02:36:12.242		34.88	-48.78	47176.12	20.01		
gamma	E	2030-11-15T02:36:34.813		34.93	-48.78	47627.89	20.02		
delta	E	2030-11-15T02:37:08.408		35.00	-48.78	48300.35	20.02		
lambda	E	2030-11-15T02:38:34.639		35.19	-48.78	50026.71	20.02		
epsilon	E	2030-11-15T02:39:44.881		35.35	-48.78	51433.28	20.03		

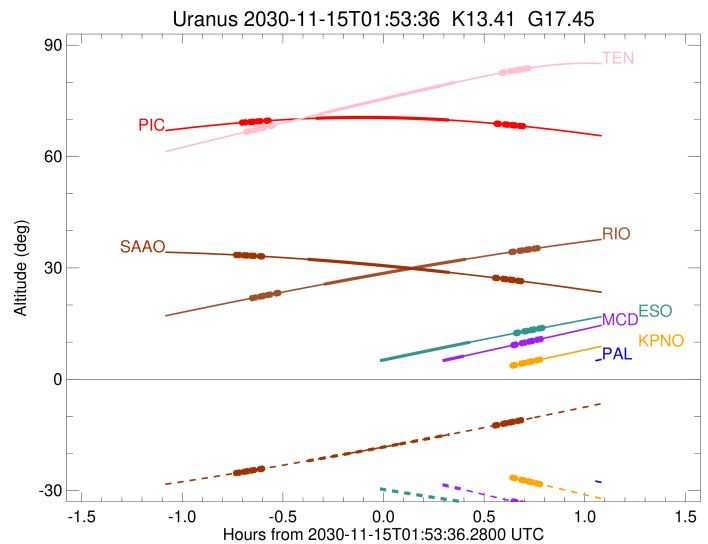
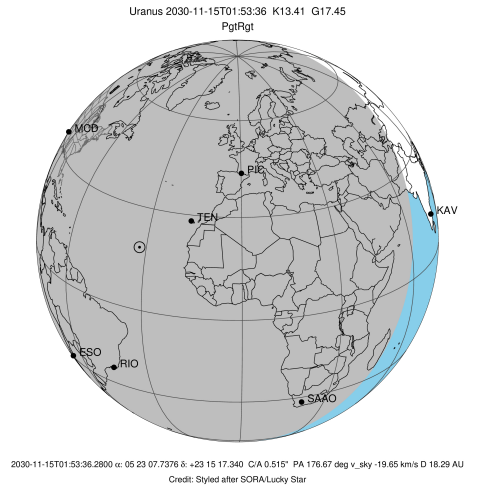
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2030-11-15T01:58:10.770
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 3416343194854408960
 2Mass ID (if available) : 05230772+2315170
 ICRS Star Coord at Epoch: 05h 23m 07.73760s +23:15:17.34011s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 13.408
 G magnitude : 17.454
 RP magnitude : 16.307
 BP magnitude : 18.882
 DUPflag : 0
 Distance (au) : 18.291
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.65
 Sun-Target sep (deg) : 150.77
 Sun-Moon sep (deg) : 25.12
 B (ring opening deg) : 81.28
 PA of pole (deg) : 22.68
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.254
 C/A sky separation (km) : 3368.4
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2030-11-15T01:15:24.088	-2.20x	-23.62	50901.13	-19.71			
lambda	I	2030-11-15T01:16:08.468	-2.05x	-23.75	50026.71	-19.70			
delta	I	2030-11-15T01:17:36.089	-1.76x	-23.99	48300.35	-19.70			
gamma	I	2030-11-15T01:18:10.349	-1.65x	-24.09	47625.36	-19.70			
eta	I	2030-11-15T01:18:33.152	-1.58x	-24.15	47176.12	-19.70			
beta	I	2030-11-15T01:19:50.172	-1.32x	-24.36	45658.70	-19.70			
alpha	I	2030-11-15T01:20:39.496	-1.16x	-24.50	44686.62	-19.70			
4	I	2030-11-15T01:22:28.311	-0.81x	-24.80	42543.67	-19.70			
5	I	2030-11-15T01:22:48.065	-0.74x	-24.85	42155.71	-19.70			
6	I	2030-11-15T01:23:05.998	-0.68x	-24.90	41803.03	-19.69			
Uranus	I	2030-11-15T01:36:52.152	2.00x	-27.12	25502.92	-2.68	-2.80		
Uranus	E	2030-11-15T02:19:20.789	9.97	-33.28	25383.46	4.76	4.98		
6	E	2030-11-15T02:33:08.823	12.46	-35.03	41866.81	19.82			
5	E	2030-11-15T02:33:31.432	12.52	-35.07	42315.24	19.83			
4	E	2030-11-15T02:33:46.123	12.57	-35.10	42604.24	19.83			
alpha	E	2030-11-15T02:35:34.422	12.89	-35.32	44751.81	19.84			
beta	E	2030-11-15T02:36:20.203	13.02	-35.41	45660.54	19.84			
eta	E	2030-11-15T02:37:36.577	13.24	-35.56	47176.12	19.85			
gamma	E	2030-11-15T02:37:59.341	13.31	-35.60	47627.92	19.85			
delta	E	2030-11-15T02:38:33.218	13.41	-35.67	48300.35	19.85			
lambda	E	2030-11-15T02:40:00.172	13.66	-35.84	50026.71	19.86			
epsilon	E	2030-11-15T02:41:11.095	13.87	-35.97	51435.19	19.87			

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2030-11-15T01:52:08.540
Event type           : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : SAAO
Location             : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)       : -32.37953
E. Longitude (deg)   : 20.81070
Altitude (km)        : 1.768
Gaia source ID       : 3416343194854408960
2Mass ID (if available) : 05230772+2315170
ICRS Star Coord at Epoch: 05h 23m 07.73760s +23:15:17.34011s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 13.408
G magnitude           : 17.454
RP magnitude          : 16.307
BP magnitude          : 18.882
DUPflag              : 0
Distance (au)        : 18.291
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -19.65
Sun-Target sep (deg) : 150.77
Sun-Moon sep (deg)   : 24.34
B (ring opening deg) : 81.28
PA of pole (deg)     : 22.68
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.116
C/A sky separation (km) : 1542.8
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
ural11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ural11.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.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	2030-11-15T01:09:53.852		33.49	-25.24	50886.85	-20.06		
lambda	I	2030-11-15T01:10:36.738		33.46	-25.13	50026.71	-20.06		
delta	I	2030-11-15T01:12:02.818		33.39	-24.92	48300.35	-20.05		
gamma	I	2030-11-15T01:12:36.489		33.36	-24.83	47625.11	-20.05		
eta	I	2030-11-15T01:12:58.878		33.34	-24.78	47176.12	-20.05		
beta	I	2030-11-15T01:14:14.494		33.28	-24.59	45659.69	-20.05		
alpha	I	2030-11-15T01:15:03.026		33.24	-24.46	44686.08	-20.05		
4	I	2030-11-15T01:16:49.986		33.15	-24.19	42541.82	-20.05		
5	I	2030-11-15T01:17:09.342		33.13	-24.14	42155.19	-20.05		
6	I	2030-11-15T01:17:26.854		33.12	-24.10	41804.42	-20.05		
Uranus	I	2030-11-15T01:30:58.466		32.32	-21.99	25471.86		-3.34	-3.50
Uranus	E	2030-11-15T02:13:16.365		28.77	-14.87	25415.64		4.29	4.50
6	E	2030-11-15T02:26:53.465		27.32	-12.44	41867.83	20.02		
5	E	2030-11-15T02:27:15.812		27.28	-12.37	42315.24	20.02		
4	E	2030-11-15T02:27:30.295		27.25	-12.33	42603.18	20.02		
alpha	E	2030-11-15T02:29:17.617		27.05	-12.00	44751.59	20.02		
beta	E	2030-11-15T02:30:03.023		26.96	-11.87	45661.15	20.02		
eta	E	2030-11-15T02:31:18.688		26.82	-11.64	47176.12	20.02		
gamma	E	2030-11-15T02:31:41.247		26.78	-11.57	47627.78	20.02		
delta	E	2030-11-15T02:32:14.840		26.71	-11.47	48300.35	20.02		
lambda	E	2030-11-15T02:33:41.066		26.55	-11.21	50026.71	20.02		
epsilon	E	2030-11-15T02:34:51.038		26.41	-10.99	51427.66	20.02		