

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2041-03-02T01:54:28.830  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 663745689032977792  
 2Mass ID (if available) : 08260622+1951408

ICRS Star Coord at Epoch: 08h 26m 06.22626s +19:51:40.93577s

RUWE (>1.4 is poor) : 1.08  
 K magnitude : 11.179  
 G magnitude : 13.314  
 RP magnitude : 12.638  
 BP magnitude : 13.844  
 DUPflag : 0  
 Distance (au) : 17.731  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.16  
 Sun-Target sep (deg) : 142.76  
 Sun-Moon sep (deg) : 150.65  
 B (ring opening deg) : 42.99  
 PA of pole (deg) : 92.51

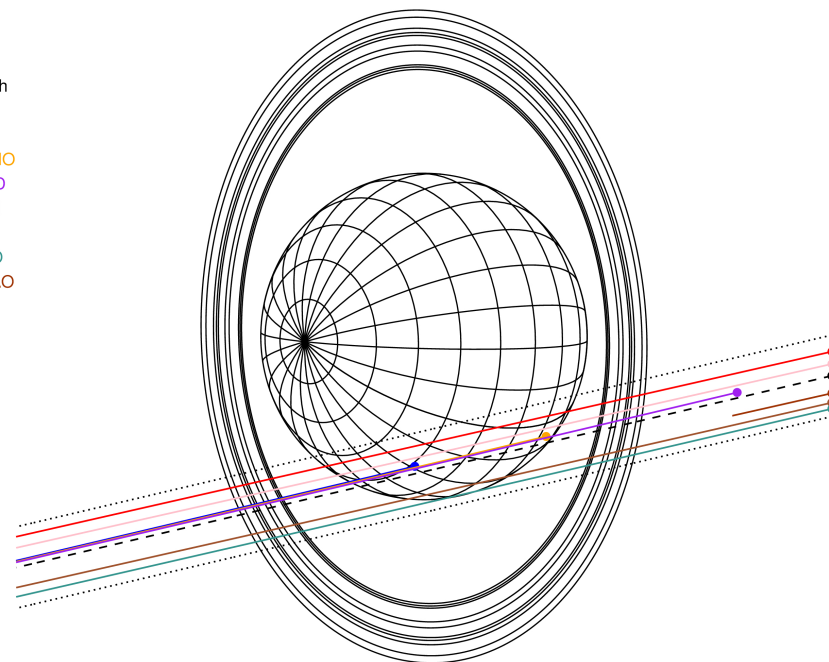
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2041-03-02T01:54:28.8300 α: 08 26 06.2263 β: +19 51 40.936 C/A 1.5977 PA 13.23 deg v\_sky -17.16 km/s D 17.73 AU  
 Credit: Styled after SORA/Lucky Star

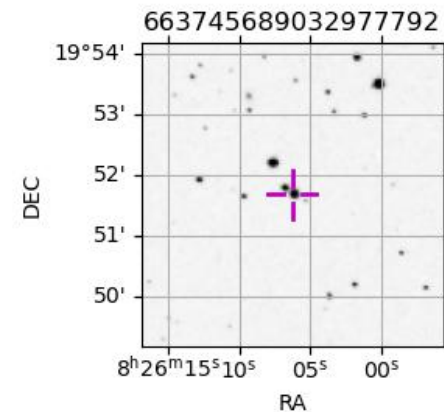
Uranus 2041-03-02T01:54:28 K11.18 G13.31 PgtRgt

Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 RIO  
 ESO  
 SAAO

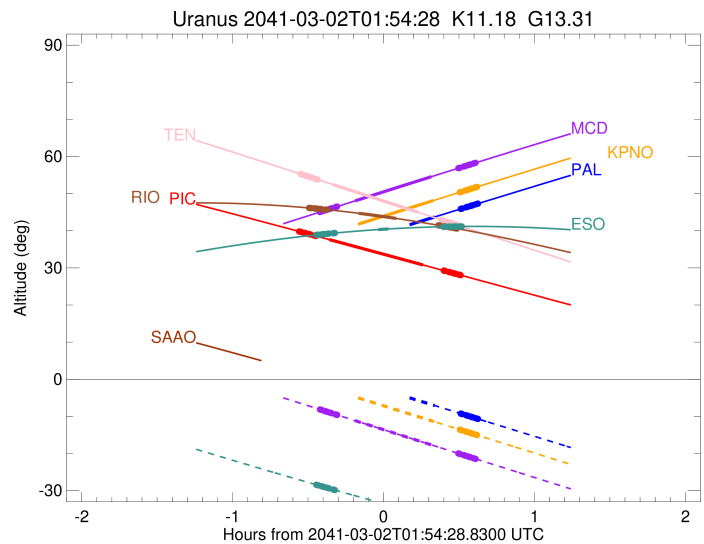
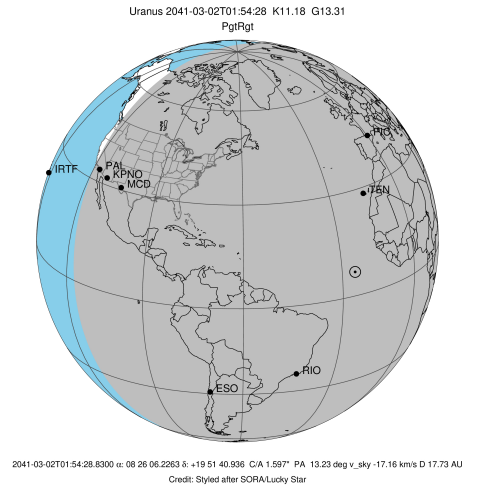


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	MAR 02 01:21 - MAR 02 02:25	PieRie
PAL	Palomar Mt (200")	33.4	243.1		+	+++++	MAR 02 02:14 - MAR 02 02:32	PneRne
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+++++	MAR 02 02:14 - MAR 02 02:31	PneRne
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	MAR 02 01:29 - MAR 02 02:31	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	MAR 02 01:21 - MAR 02 02:24	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	+++++	+ +	+++++	MAR 02 01:25 - MAR 02 02:23	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	MAR 02 01:27 - MAR 02 02:25	PieRie
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

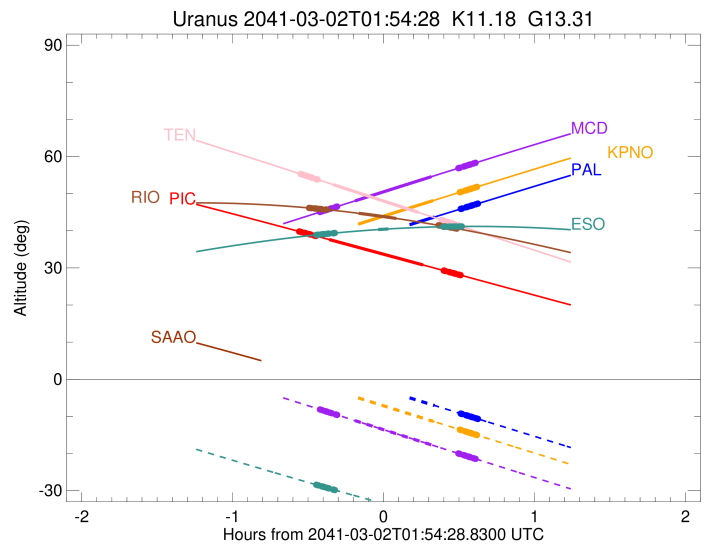
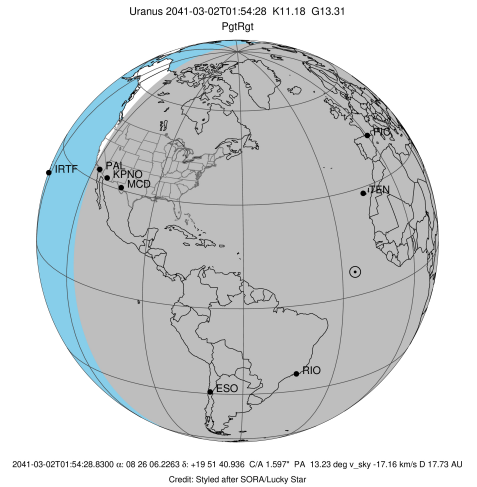


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2041-03-02T01:51:28.860  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 663745689032977792  
 2Mass ID (if available) : 08260622+1951408  
 ICRS Star Coord at Epoch: 08h 26m 06.22626s +19:51:40.93577s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 11.179  
 G magnitude : 13.314  
 RP magnitude : 12.638  
 BP magnitude : 13.844  
 DUPflag : 0  
 Distance (au) : 17.731  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.16  
 Sun-Target sep (deg) : 142.76  
 Sun-Moon sep (deg) : 150.39  
 B (ring opening deg) : 42.99  
 PA of pole (deg) : 92.51  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.278  
 C/A sky separation (km) : 16439.1  
 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



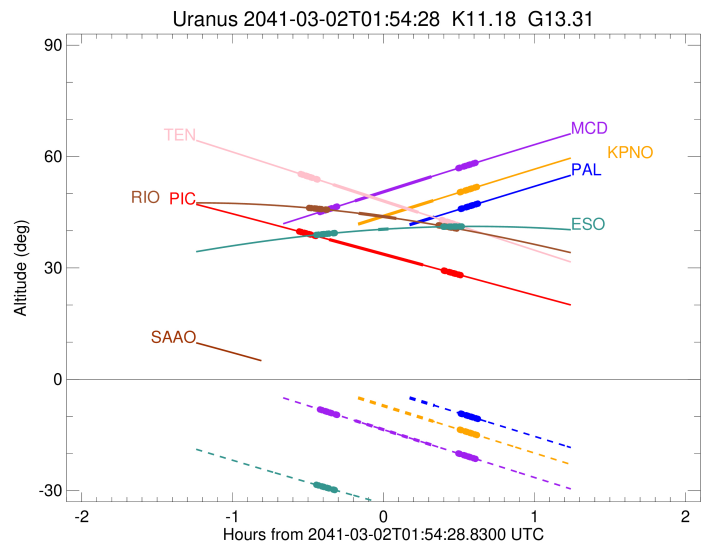
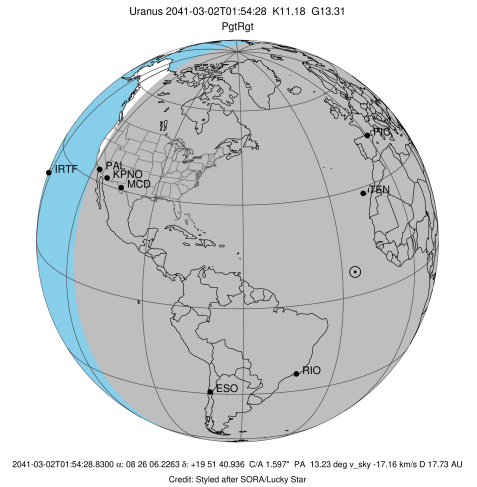
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-03-02T01:21:08.412		39.78	-51.21	50935.45	-23.89		
lambda	I	2041-03-02T01:21:46.585		39.67	-51.16	50026.71	-23.78		
delta	I	2041-03-02T01:22:59.352		39.45	-51.05	48300.35	-23.67		
gamma	I	2041-03-02T01:23:28.000		39.36	-51.01	47622.95	-23.62		
eta	I	2041-03-02T01:23:46.929		39.30	-50.98	47176.12	-23.59		
beta	I	2041-03-02T01:24:50.307		39.11	-50.88	45681.11	-23.47		
alpha	I	2041-03-02T01:25:32.810		38.98	-50.82	44699.10	-23.39		
4	I	2041-03-02T01:27:05.369		38.70	-50.68	42530.41	-23.20		
5	I	2041-03-02T01:27:23.261		38.65	-50.65	42157.09	-23.18		
6	I	2041-03-02T01:27:35.319		38.61	-50.63	41795.59	-23.10		
Uranus	I	2041-03-02T01:32:53.793		37.64	-50.12	25355.69		-39.24	-40.53
Uranus	E	2041-03-02T02:10:12.824		30.79	-45.82	25448.47		27.72	28.82
6	E	2041-03-02T02:18:29.778		29.27	-44.72	41871.97	23.00		
5	E	2041-03-02T02:18:45.127		29.22	-44.69	42275.17	23.07		
4	E	2041-03-02T02:19:00.638		29.17	-44.65	42613.81	23.10		
alpha	E	2041-03-02T02:20:31.672		28.89	-44.44	44713.44	23.28		
beta	E	2041-03-02T02:21:11.893		28.77	-44.35	45644.94	23.36		
eta	E	2041-03-02T02:22:17.125		28.57	-44.20	47176.12	23.47		
gamma	E	2041-03-02T02:22:36.514		28.51	-44.16	47631.49	23.50		
delta	E	2041-03-02T02:23:04.949		28.42	-44.09	48300.35	23.54		
lambda	E	2041-03-02T02:24:18.106		28.20	-43.92	50026.71	23.65		
epsilon	E	2041-03-02T02:25:21.490		28.01	-43.78	51528.32	23.75		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2041-03-02T01:59:00.200  
 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 : 663745689032977792  
 2Mass ID (if available) : 08260622+1951408  
 ICRS Star Coord at Epoch: 08h 26m 06.22626s +19:51:40.93577s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 11.179  
 G magnitude : 13.314  
 RP magnitude : 12.638  
 BP magnitude : 13.844  
 DUPflag : 0  
 Distance (au) : 17.731  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.16  
 Sun-Target sep (deg) : 142.76  
 Sun-Moon sep (deg) : 151.59  
 B (ring opening deg) : 42.99  
 PA of pole (deg) : 92.51  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.512  
 C/A sky separation (km) : 19446.6  
 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



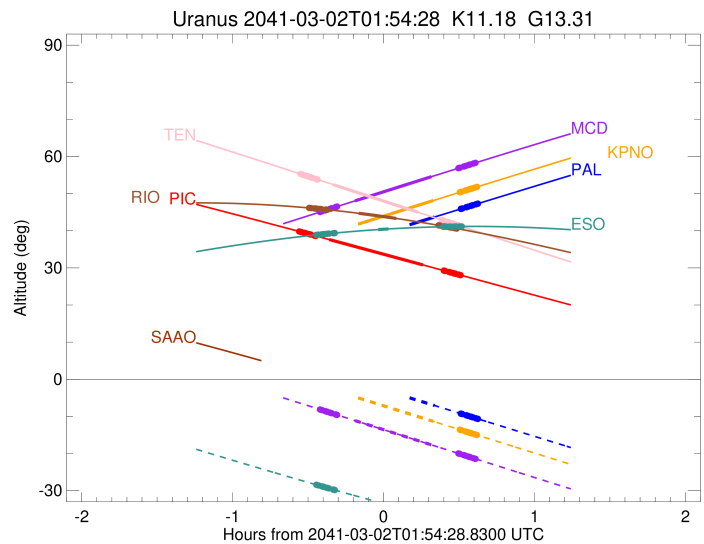
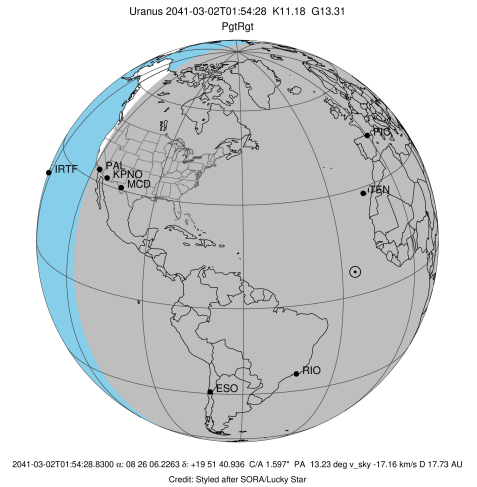
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-03-02T01:29:52.659		34.29	2.24x	50955.14	-23.34		
lambda	I	2041-03-02T01:30:32.623		34.43	2.11x	50026.71	-23.19		
delta	I	2041-03-02T01:31:47.297		34.69	1.85x	48300.35	-23.04		
gamma	I	2041-03-02T01:32:16.726		34.79	1.75x	47623.22	-22.98		
eta	I	2041-03-02T01:32:36.204		34.86	1.68x	47176.12	-22.93		
beta	I	2041-03-02T01:33:41.489		35.09	1.46x	45680.93	-22.77		
alpha	I	2041-03-02T01:34:25.412		35.24	1.31x	44697.27	-22.65		
4	I	2041-03-02T01:36:00.939		35.58	0.98x	42531.93	-22.39		
5	I	2041-03-02T01:36:19.597		35.64	0.91x	42155.92	-22.34		
6	I	2041-03-02T01:36:32.116		35.69	0.87x	41796.33	-22.25		
Uranus	I	2041-03-02T01:43:21.162		37.12	-0.54x	25394.75		-34.60	-35.85
Uranus	E	2041-03-02T02:14:47.102		43.71	-7.08	25492.90		21.05	21.96
6	E	2041-03-02T02:25:14.321		45.90	-9.26	41869.69	22.32		
5	E	2041-03-02T02:25:30.287		45.95	-9.31	42268.98	22.41		
4	E	2041-03-02T02:25:46.284		46.01	-9.37	42612.32	22.46		
alpha	E	2041-03-02T02:27:19.719		46.33	-9.69	44710.72	22.73		
beta	E	2041-03-02T02:28:00.980		46.48	-9.84	45645.93	22.85		
eta	E	2041-03-02T02:29:07.549		46.71	-10.07	47176.12	23.02		
gamma	E	2041-03-02T02:29:27.316		46.78	-10.14	47631.55	23.06		
delta	E	2041-03-02T02:29:56.275		46.88	-10.24	48300.35	23.13		
lambda	E	2041-03-02T02:31:10.661		47.13	-10.50	50026.71	23.29		
epsilon	E	2041-03-02T02:32:15.375		47.36	-10.72	51537.64	23.43		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2041-03-02T01:58:43.850  
 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 : 663745689032977792  
 2Mass ID (if available) : 08260622+1951408  
 ICRS Star Coord at Epoch: 08h 26m 06.22626s +19:51:40.93577s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 11.179  
 G magnitude : 13.314  
 RP magnitude : 12.638  
 BP magnitude : 13.844  
 DUPflag : 0  
 Distance (au) : 17.731  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.16  
 Sun-Target sep (deg) : 142.76  
 Sun-Moon sep (deg) : 151.59  
 B (ring opening deg) : 42.99  
 PA of pole (deg) : 92.51  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.528  
 C/A sky separation (km) : 19652.1  
 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



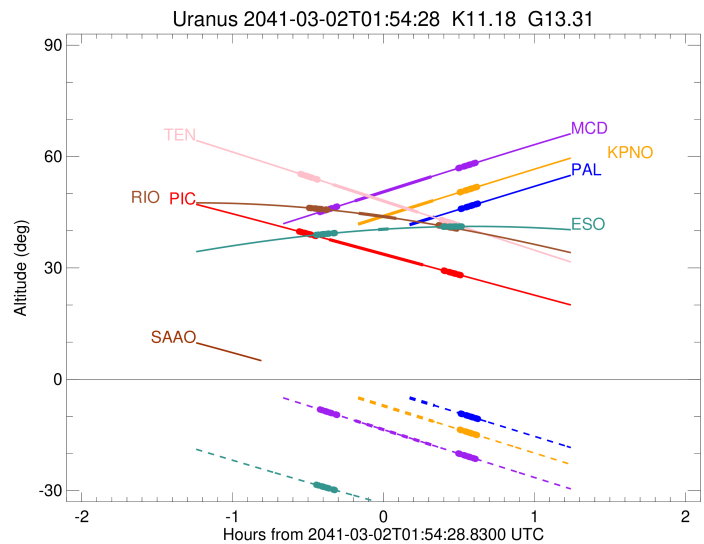
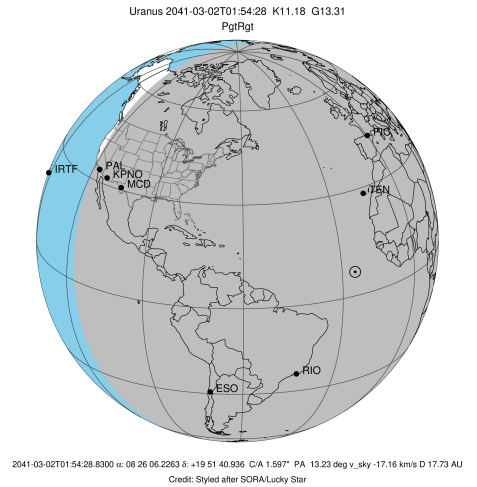
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-03-02T01:29:43.598		38.66	-1.91x	50956.87	-23.34		
lambda	I	2041-03-02T01:30:23.636		38.80	-2.05x	50026.71	-23.19		
delta	I	2041-03-02T01:31:38.319		39.07	-2.31x	48300.35	-23.04		
gamma	I	2041-03-02T01:32:07.755		39.17	-2.42x	47623.24	-22.97		
eta	I	2041-03-02T01:32:27.240		39.24	-2.48x	47176.12	-22.92		
beta	I	2041-03-02T01:33:32.554		39.47	-2.71x	45680.90	-22.76		
alpha	I	2041-03-02T01:34:16.509		39.63	-2.87x	44697.12	-22.64		
4	I	2041-03-02T01:35:52.095		39.97	-3.20x	42532.06	-22.36		
5	I	2041-03-02T01:36:10.780		40.04	-3.27x	42155.84	-22.32		
6	I	2041-03-02T01:36:23.315		40.08	-3.31x	41796.40	-22.23		
Uranus	I	2041-03-02T01:43:20.335		41.56	-4.78x	25398.27		-34.18	-35.41
Uranus	E	2041-03-02T02:14:15.382		48.14	-11.34	25495.61		20.60	21.48
6	E	2041-03-02T02:24:51.721		50.38	-13.59	41869.55	22.29		
5	E	2041-03-02T02:25:07.719		50.44	-13.64	42268.62	22.38		
4	E	2041-03-02T02:25:23.738		50.50	-13.70	42612.22	22.43		
alpha	E	2041-03-02T02:26:57.275		50.82	-14.03	44710.57	22.71		
beta	E	2041-03-02T02:27:38.578		50.97	-14.18	45645.99	22.83		
eta	E	2041-03-02T02:28:45.192		51.20	-14.41	47176.12	23.00		
gamma	E	2041-03-02T02:29:04.971		51.27	-14.48	47631.55	23.05		
delta	E	2041-03-02T02:29:33.945		51.38	-14.59	48300.35	23.12		
lambda	E	2041-03-02T02:30:48.363		51.64	-14.85	50026.71	23.28		
epsilon	E	2041-03-02T02:31:53.114		51.87	-15.08	51538.09	23.43		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2041-03-02T01:58:15.620  
 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 : 663745689032977792  
 2Mass ID (if available) : 08260622+1951408  
 ICRS Star Coord at Epoch: 08h 26m 06.22626s +19:51:40.93577s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 11.179  
 G magnitude : 13.314  
 RP magnitude : 12.638  
 BP magnitude : 13.844  
 DUPflag : 0  
 Distance (au) : 17.731  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.16  
 Sun-Target sep (deg) : 142.76  
 Sun-Moon sep (deg) : 151.56  
 B (ring opening deg) : 42.99  
 PA of pole (deg) : 92.51  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.543  
 C/A sky separation (km) : 19842.1  
 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



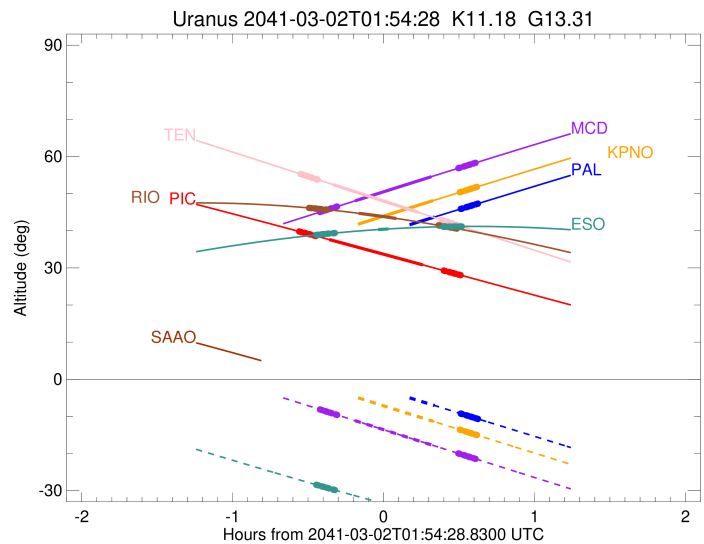
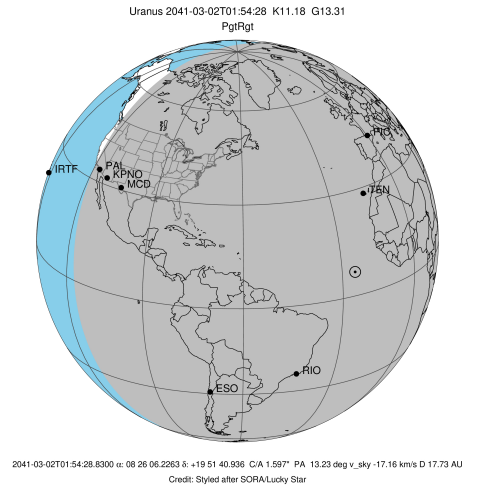
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-03-02T01:29:22.963		45.09	-8.17	50958.59	-23.36		
lambda	I	2041-03-02T01:30:03.046		45.23	-8.32	50026.71	-23.21		
delta	I	2041-03-02T01:31:17.685		45.50	-8.58	48300.35	-23.05		
gamma	I	2041-03-02T01:31:47.106		45.60	-8.69	47623.26	-22.98		
eta	I	2041-03-02T01:32:06.584		45.67	-8.76	47176.12	-22.93		
beta	I	2041-03-02T01:33:11.881		45.91	-8.99	45680.88	-22.76		
alpha	I	2041-03-02T01:33:55.835		46.07	-9.15	44696.98	-22.64		
4	I	2041-03-02T01:35:31.411		46.41	-9.49	42532.20	-22.36		
5	I	2041-03-02T01:35:50.108		46.48	-9.56	42155.77	-22.31		
6	I	2041-03-02T01:36:02.651		46.52	-9.61	41796.47	-22.22		
Uranus	I	2041-03-02T01:43:07.242		48.05	-11.13	25401.70		-33.76	-34.99
Uranus	E	2041-03-02T02:13:32.178		54.58	-17.68	25498.01		20.18	21.06
6	E	2041-03-02T02:24:16.569		56.86	-19.98	41869.43	22.28		
5	E	2041-03-02T02:24:32.586		56.92	-20.04	42268.30	22.37		
4	E	2041-03-02T02:24:48.619		56.98	-20.10	42612.14	22.42		
alpha	E	2041-03-02T02:26:22.207		57.31	-20.43	44710.44	22.70		
beta	E	2041-03-02T02:27:03.530		57.45	-20.58	45646.04	22.83		
eta	E	2041-03-02T02:28:10.156		57.69	-20.82	47176.12	23.00		
gamma	E	2041-03-02T02:28:29.937		57.76	-20.89	47631.55	23.05		
delta	E	2041-03-02T02:28:58.912		57.86	-21.00	48300.35	23.12		
lambda	E	2041-03-02T02:30:13.327		58.12	-21.26	50026.71	23.28		
epsilon	E	2041-03-02T02:31:18.082		58.35	-21.49	51538.46	23.43		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2041-03-02T01:51:15.500  
 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 : 663745689032977792  
 2Mass ID (if available) : 08260622+1951408  
 ICRS Star Coord at Epoch: 08h 26m 06.22626s +19:51:40.93577s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 11.179  
 G magnitude : 13.314  
 RP magnitude : 12.638  
 BP magnitude : 13.844  
 DUPflag : 0  
 Distance (au) : 17.731  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.16  
 Sun-Target sep (deg) : 142.76  
 Sun-Moon sep (deg) : 150.48  
 B (ring opening deg) : 42.99  
 PA of pole (deg) : 92.51  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.420  
 C/A sky separation (km) : 18259.9  
 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\_itr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



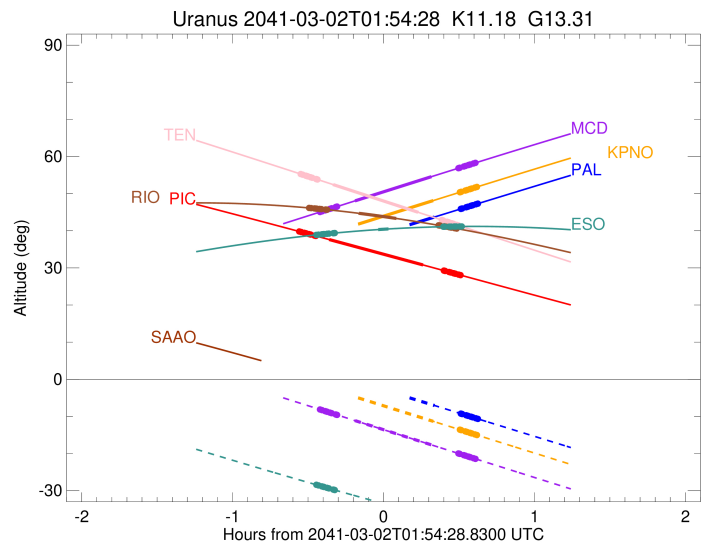
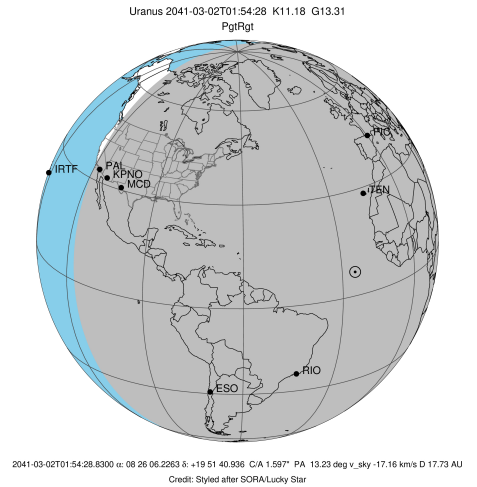
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2041-03-02T01:21:43.333		55.25	-68.97	50949.06	-23.73		
lambda	I	2041-03-02T01:22:22.355		55.11	-68.97	50026.71	-23.60		
delta	I	2041-03-02T01:23:35.710		54.84	-68.95	48300.35	-23.46		
gamma	I	2041-03-02T01:24:04.607		54.73	-68.94	47623.13	-23.41		
eta	I	2041-03-02T01:24:23.722		54.66	-68.94	47176.12	-23.37		
beta	I	2041-03-02T01:25:27.760		54.43	-68.92	45680.99	-23.22		
alpha	I	2041-03-02T01:26:10.796		54.27	-68.90	44697.85	-23.12		
4	I	2041-03-02T01:27:44.409		53.93	-68.87	42531.41	-22.88		
5	I	2041-03-02T01:28:02.632		53.86	-68.86	42156.26	-22.84		
6	I	2041-03-02T01:28:14.868		53.81	-68.85	41796.06	-22.76		
Uranus	I	2041-03-02T01:34:24.476		52.46	-68.64	25379.98		-36.38	-37.65
Uranus	E	2041-03-02T02:08:15.732		44.98	-65.86	25473.31		24.16	25.16
6	E	2041-03-02T02:17:40.345		42.90	-64.68	41870.78	22.66		
5	E	2041-03-02T02:17:56.002		42.84	-64.65	42271.88	22.74		
4	E	2041-03-02T02:18:11.753		42.78	-64.62	42613.05	22.78		
alpha	E	2041-03-02T02:19:43.956		42.44	-64.41	44711.99	23.01		
beta	E	2041-03-02T02:20:24.682		42.29	-64.32	45645.45	23.11		
eta	E	2041-03-02T02:21:30.551		42.05	-64.17	47176.12	23.25		
gamma	E	2041-03-02T02:21:50.119		41.98	-64.12	47631.52	23.29		
delta	E	2041-03-02T02:22:18.800		41.87	-64.06	48300.35	23.35		
lambda	E	2041-03-02T02:23:32.531		41.60	-63.88	50026.71	23.48		
epsilon	E	2041-03-02T02:24:36.561		41.36	-63.73	51533.44	23.61		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2041-03-02T01:52:00.490  
 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 : 663745689032977792  
 2Mass ID (if available) : 08260622+1951408  
 ICRS Star Coord at Epoch: 08h 26m 06.22626s +19:51:40.93577s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 11.179  
 G magnitude : 13.314  
 RP magnitude : 12.638  
 BP magnitude : 13.844  
 DUPflag : 0  
 Distance (au) : 17.731  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.16  
 Sun-Target sep (deg) : 142.76  
 Sun-Moon sep (deg) : 150.67  
 B (ring opening deg) : 42.99  
 PA of pole (deg) : 92.51  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.888  
 C/A sky separation (km) : 24283.3  
 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\_itrff93\_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	2041-03-02T01:25:01.472		46.14	-51.40	50996.40	-22.48		
lambda	I	2041-03-02T01:25:44.905		46.10	-51.51	50026.71	-22.26		
delta	I	2041-03-02T01:27:02.906		46.02	-51.71	48300.35	-22.00		
gamma	I	2041-03-02T01:27:33.735		45.98	-51.79	47623.77	-21.89		
eta	I	2041-03-02T01:27:54.220		45.96	-51.84	47176.12	-21.82		
beta	I	2041-03-02T01:29:03.082		45.89	-52.02	45680.31	-21.54		
alpha	I	2041-03-02T01:29:49.709		45.84	-52.13	44693.96	-21.34		
4	I	2041-03-02T01:31:31.142		45.72	-52.39	42535.49	-20.88		
5	I	2041-03-02T01:31:51.296		45.70	-52.44	42154.85	-20.79		
6	I	2041-03-02T01:32:04.918		45.68	-52.47	41798.41	-20.67		
Uranus	I	2041-03-02T01:44:37.218		44.71	-54.25	25498.43		-20.11	-20.98
Uranus	E	2041-03-02T01:59:34.195		43.32	-56.12	25553.84		5.75	6.02
6	E	2041-03-02T02:16:23.781		41.47	-57.86	41865.86	20.62		
5	E	2041-03-02T02:16:41.295		41.43	-57.89	42259.41	20.75		
4	E	2041-03-02T02:16:58.622		41.40	-57.91	42609.57	20.83		
alpha	E	2041-03-02T02:18:38.848		41.20	-58.06	44706.89	21.29		
beta	E	2041-03-02T02:19:22.983		41.11	-58.13	45647.53	21.49		
eta	E	2041-03-02T02:20:33.524		40.97	-58.22	47176.12	21.76		
gamma	E	2041-03-02T02:20:54.418		40.93	-58.25	47631.58	21.84		
delta	E	2041-03-02T02:21:24.970		40.86	-58.30	48300.35	21.94		
lambda	E	2041-03-02T02:22:43.182		40.70	-58.40	50026.71	22.20		
epsilon	E	2041-03-02T02:23:51.371		40.56	-58.49	51547.36	22.42		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2041-03-02T01:54:19.770  
 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 : 663745689032977792  
 2Mass ID (if available) : 08260622+1951408  
 ICRS Star Coord at Epoch: 08h 26m 06.22626s +19:51:40.93577s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 11.179  
 G magnitude : 13.314  
 RP magnitude : 12.638  
 BP magnitude : 13.844  
 DUPflag : 0  
 Distance (au) : 17.731  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.16  
 Sun-Target sep (deg) : 142.76  
 Sun-Moon sep (deg) : 151.02  
 B (ring opening deg) : 42.99  
 PA of pole (deg) : 92.51  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.979  
 C/A sky separation (km) : 25456.1  
 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	2041-03-02T01:27:54.941		38.90	-28.45	51005.48	-22.12		
lambda	I	2041-03-02T01:28:39.522		38.95	-28.59	50026.71	-21.88		
delta	I	2041-03-02T01:29:58.937		39.04	-28.85	48300.35	-21.59		
gamma	I	2041-03-02T01:30:30.353		39.08	-28.95	47623.90	-21.47		
eta	I	2041-03-02T01:30:51.249		39.10	-29.02	47176.12	-21.39		
beta	I	2041-03-02T01:32:01.567		39.18	-29.24	45680.13	-21.08		
alpha	I	2041-03-02T01:32:49.260		39.24	-29.40	44693.28	-20.86		
4	I	2041-03-02T01:34:33.112		39.35	-29.73	42536.40	-20.34		
5	I	2041-03-02T01:34:53.822		39.37	-29.80	42154.83	-20.24		
6	I	2041-03-02T01:35:07.884		39.39	-29.84	41799.00	-20.10		
Uranus	I	2041-03-02T01:52:21.694		40.32	-33.09	25540.25		-11.02	-11.53
Uranus	E	2041-03-02T01:56:28.806		40.50	-33.85	25556.56		-3.95	-4.14
6	E	2041-03-02T02:18:16.260		41.09	-37.74	41864.64	20.10		
5	E	2041-03-02T02:18:34.292		41.09	-37.79	42256.52	20.24		
4	E	2041-03-02T02:18:52.070		41.10	-37.84	42608.64	20.34		
alpha	E	2041-03-02T02:20:34.551		41.12	-38.14	44705.79	20.86		
beta	E	2041-03-02T02:21:19.626		41.13	-38.27	45648.04	21.08		
eta	E	2041-03-02T02:22:31.449		41.14	-38.47	47176.12	21.39		
gamma	E	2041-03-02T02:22:52.703		41.14	-38.53	47631.57	21.47		
delta	E	2041-03-02T02:23:23.762		41.15	-38.62	48300.35	21.59		
lambda	E	2041-03-02T02:24:43.178		41.16	-38.85	50026.71	21.88		
epsilon	E	2041-03-02T02:25:52.413		41.16	-39.04	51549.51	22.12		