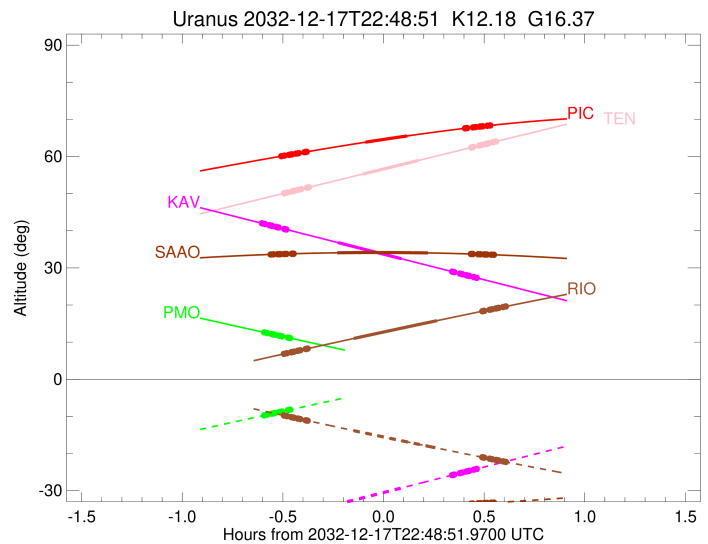
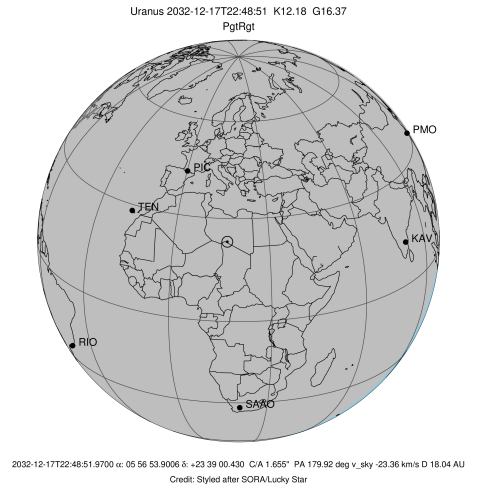
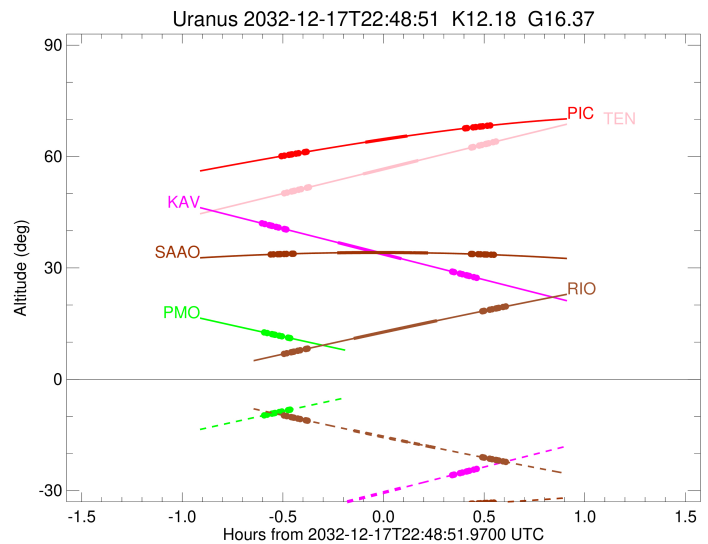
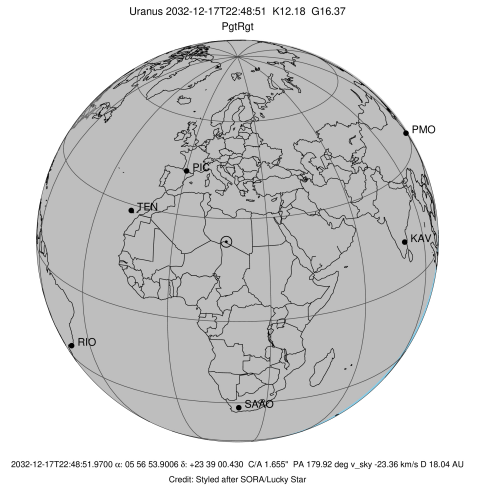


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-17T22:50:02.490
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3424832317974689280
 2Mass ID (if available) : 05565390+2339004
 ICRS Star Coord at Epoch: 05h 56m 53.90055s +23:39:00.42952s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 12.178
 G magnitude : 16.372
 RP magnitude : 15.240
 BP magnitude : 17.723
 DUPflag : 0
 Distance (au) : 18.037
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.36
 Sun-Target sep (deg) : 176.81
 Sun-Moon sep (deg) : 11.53
 B (ring opening deg) : 75.94
 PA of pole (deg) : 55.09
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.815
 C/A sky separation (km) : 23749.9
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



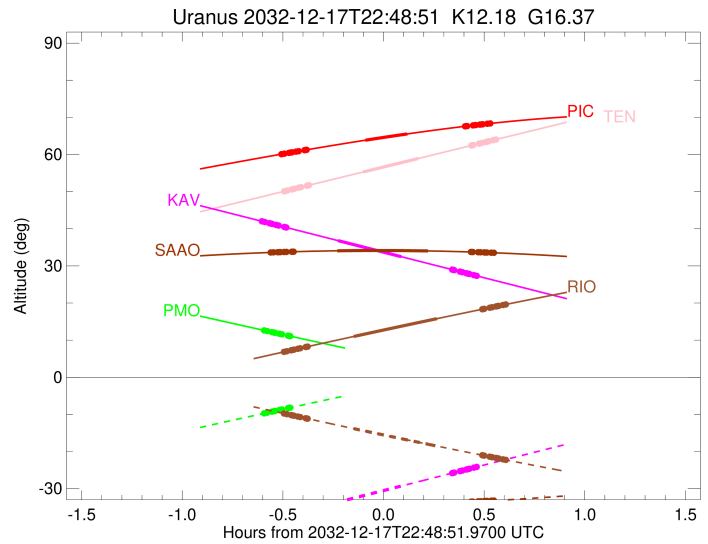
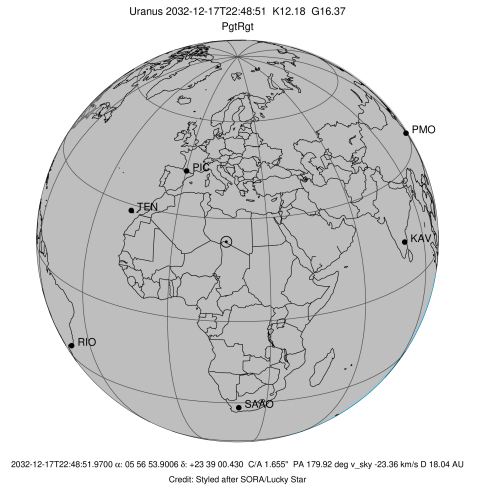
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-17T22:18:18.132		60.08	-62.03	51316.49	-21.44		
lambda	I	2032-12-17T22:19:18.748		60.24	-62.18	50026.71	-21.20		
delta	I	2032-12-17T22:20:40.623		60.45	-62.38	48300.35	-20.97		
gamma	I	2032-12-17T22:21:12.622		60.54	-62.46	47630.96	-20.87		
eta	I	2032-12-17T22:21:34.452		60.59	-62.51	47176.12	-20.80		
beta	I	2032-12-17T22:22:46.747		60.78	-62.69	45680.75	-20.56		
alpha	I	2032-12-17T22:23:32.140		60.90	-62.80	44752.41	-20.40		
4	I	2032-12-17T22:25:19.621		61.18	-63.06	42581.27	-19.94		
5	I	2032-12-17T22:25:33.494		61.21	-63.09	42308.98	-19.91		
6	I	2032-12-17T22:25:58.696		61.28	-63.15	41806.47	-19.79		
Uranus	I	2032-12-17T22:43:27.296		63.86	-65.51	25528.33		3.24	3.39
Uranus	E	2032-12-17T22:55:56.914		65.55	-67.00	25190.60		11.39	11.92
6	E	2032-12-17T23:13:12.794		67.61	-68.71	41875.29	19.82		
5	E	2032-12-17T23:13:30.640		67.64	-68.74	42237.75	19.93		
4	E	2032-12-17T23:13:44.841		67.66	-68.76	42526.41	19.97		
alpha	E	2032-12-17T23:15:32.807		67.85	-68.91	44705.19	20.42		
beta	E	2032-12-17T23:16:19.005		67.93	-68.97	45648.46	20.58		
eta	E	2032-12-17T23:17:32.738		68.06	-69.07	47176.12	20.83		
gamma	E	2032-12-17T23:17:54.102		68.10	-69.10	47621.79	20.90		
delta	E	2032-12-17T23:18:26.497		68.15	-69.14	48300.35	21.00		
lambda	E	2032-12-17T23:19:48.263		68.29	-69.24	50026.71	21.23		
epsilon	E	2032-12-17T23:20:50.673		68.39	-69.32	51356.68	21.47		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-17T22:44:55.490
 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 : 3424832317974689280
 2Mass ID (if available) : 05565390+2339004
 ICRS Star Coord at Epoch: 05h 56m 53.90055s +23:39:00.42952s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 12.178
 G magnitude : 16.372
 RP magnitude : 15.240
 BP magnitude : 17.723
 DUPflag : 0
 Distance (au) : 18.037
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.36
 Sun-Target sep (deg) : 176.81
 Sun-Moon sep (deg) : 10.59
 B (ring opening deg) : 75.94
 PA of pole (deg) : 55.09
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.906
 C/A sky separation (km) : 24933.8
 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



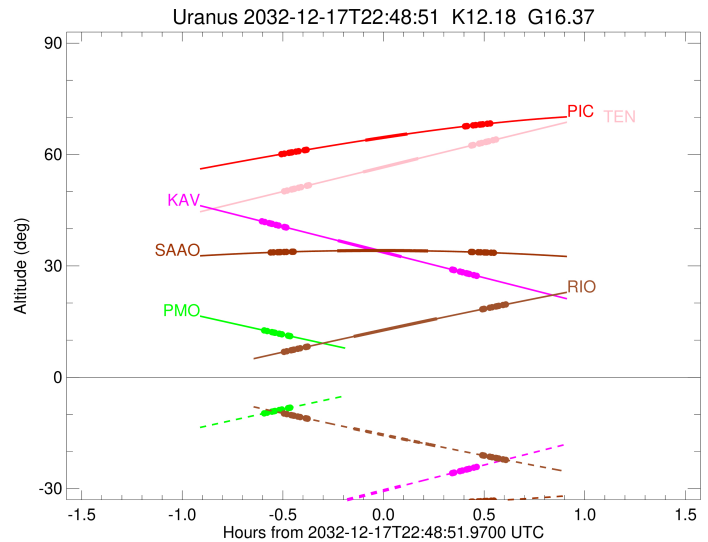
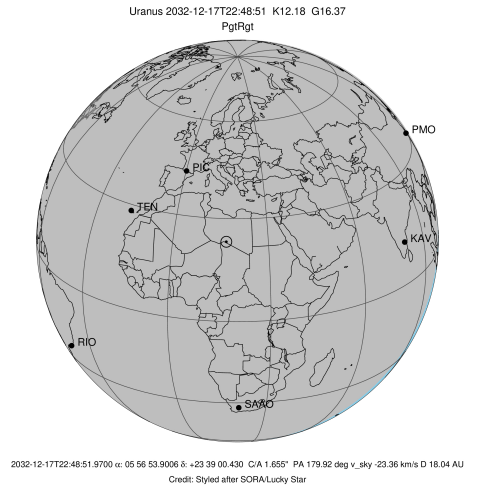
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-17T22:13:09.540		12.65	-9.75	51322.94	-20.87		
lambda	I	2032-12-17T22:14:12.160		12.44	-9.54	50026.71	-20.61		
delta	I	2032-12-17T22:15:36.439		12.16	-9.26	48300.35	-20.35		
gamma	I	2032-12-17T22:16:09.419		12.05	-9.15	47630.90	-20.24		
eta	I	2032-12-17T22:16:31.928		11.98	-9.08	47176.12	-20.17		
beta	I	2032-12-17T22:17:46.571		11.73	-8.84	45680.64	-19.89		
alpha	I	2032-12-17T22:18:33.498		11.57	-8.68	44752.43	-19.71		
4	I	2032-12-17T22:20:24.957		11.20	-8.32	42580.14	-19.21		
5	I	2032-12-17T22:20:39.255		11.16	-8.27	42309.76	-19.17		
6	I	2032-12-17T22:21:05.459		11.07	-8.19	41807.26	-19.04		
Uranus	I	2032-12-17T22:41:11.420		7.11	-4.28x	25475.25		5.36	5.61
Uranus	E	2032-12-17T22:47:56.461		5.80	-2.99x	25288.14		9.72	10.18
6	E	2032-12-17T23:07:51.933		1.97x	0.77x	41874.43	18.97		
5	E	2032-12-17T23:08:10.799		1.91x	0.83x	42241.17	19.10		
4	E	2032-12-17T23:08:25.393		1.87x	0.88x	42526.18	19.14		
alpha	E	2032-12-17T23:10:17.930		1.51x	1.23x	44706.44	19.64		
beta	E	2032-12-17T23:11:05.909		1.36x	1.38x	45649.08	19.82		
eta	E	2032-12-17T23:12:22.404		1.12x	1.61x	47176.12	20.08		
gamma	E	2032-12-17T23:12:44.560		1.05x	1.68x	47621.91	20.16		
delta	E	2032-12-17T23:13:18.126		0.94x	1.79x	48300.35	20.27		
lambda	E	2032-12-17T23:14:42.773		0.68x	2.05x	50026.71	20.52		
epsilon	E	2032-12-17T23:15:47.883		0.47x	2.25x	51368.58	20.77		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-17T22:51:18.360
 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 : 3424832317974689280
 2Mass ID (if available) : 05565390+2339004
 ICRS Star Coord at Epoch: 05h 56m 53.90055s +23:39:00.42952s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 12.178
 G magnitude : 16.372
 RP magnitude : 15.240
 BP magnitude : 17.723
 DUPflag : 0
 Distance (au) : 18.037
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.36
 Sun-Target sep (deg) : 176.81
 Sun-Moon sep (deg) : 11.66
 B (ring opening deg) : 75.94
 PA of pole (deg) : 55.09
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.719
 C/A sky separation (km) : 22484.7
 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



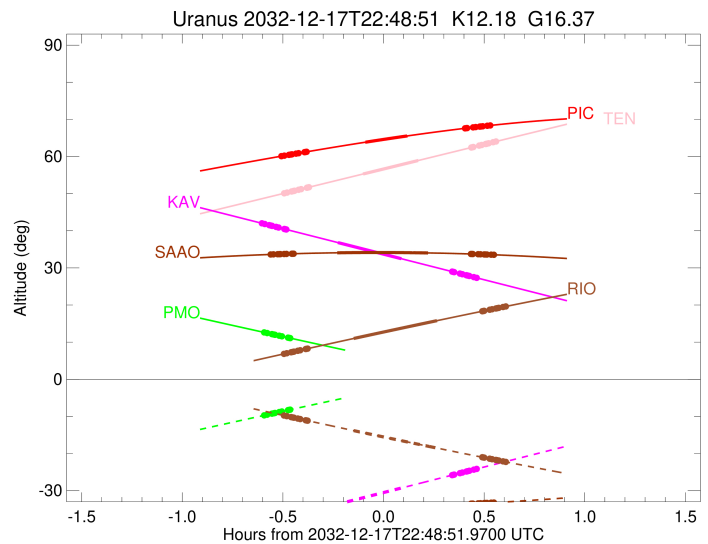
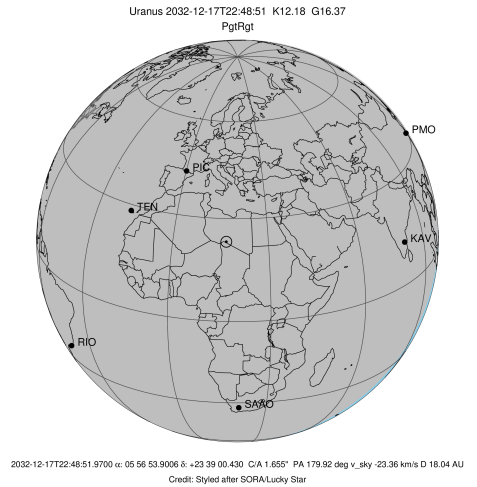
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-17T22:19:08.950		50.08	-53.08	51306.89	-21.73		
lambda	I	2032-12-17T22:20:08.260		50.29	-53.30	50026.71	-21.52		
delta	I	2032-12-17T22:21:28.872		50.59	-53.60	48300.35	-21.31		
gamma	I	2032-12-17T22:22:00.340		50.71	-53.71	47631.03	-21.23		
eta	I	2032-12-17T22:22:21.802		50.79	-53.79	47176.12	-21.17		
beta	I	2032-12-17T22:23:32.786		51.05	-54.05	45680.87	-20.95		
alpha	I	2032-12-17T22:24:17.313		51.21	-54.22	44752.36	-20.81		
4	I	2032-12-17T22:26:02.411		51.60	-54.60	42582.76	-20.42		
5	I	2032-12-17T22:26:16.100		51.65	-54.65	42307.87	-20.39		
6	I	2032-12-17T22:26:40.683		51.74	-54.74	41805.47	-20.28		
Uranus	I	2032-12-17T22:42:46.168		55.29	-58.29	25551.23		1.63	1.70
Uranus	E	2032-12-17T22:59:11.779		58.92	-61.91	25129.65		12.34	12.90
6	E	2032-12-17T23:15:04.687		62.43	-65.40	41875.99	20.33		
5	E	2032-12-17T23:15:21.896		62.50	-65.46	42234.68	20.44		
4	E	2032-12-17T23:15:35.940		62.55	-65.51	42526.70	20.46		
alpha	E	2032-12-17T23:17:21.379		62.94	-65.90	44704.09	20.86		
beta	E	2032-12-17T23:18:06.651		63.10	-66.07	45647.93	21.01		
eta	E	2032-12-17T23:19:18.983		63.37	-66.33	47176.12	21.22		
gamma	E	2032-12-17T23:19:39.950		63.45	-66.41	47621.70	21.28		
delta	E	2032-12-17T23:20:11.771		63.57	-66.52	48300.35	21.37		
lambda	E	2032-12-17T23:21:32.160		63.86	-66.82	50026.71	21.58		
epsilon	E	2032-12-17T23:22:33.106		64.08	-67.04	51346.13	21.79		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-17T22:45:01.250
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 3424832317974689280
 2Mass ID (if available) : 05565390+2339004
 ICRS Star Coord at Epoch: 05h 56m 53.90055s +23:39:00.42952s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 12.178
 G magnitude : 16.372
 RP magnitude : 15.240
 BP magnitude : 17.723
 DUPflag : 0
 Distance (au) : 18.037
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.36
 Sun-Target sep (deg) : 176.81
 Sun-Moon sep (deg) : 10.42
 B (ring opening deg) : 75.94
 PA of pole (deg) : 55.09
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.643
 C/A sky separation (km) : 21489.2
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



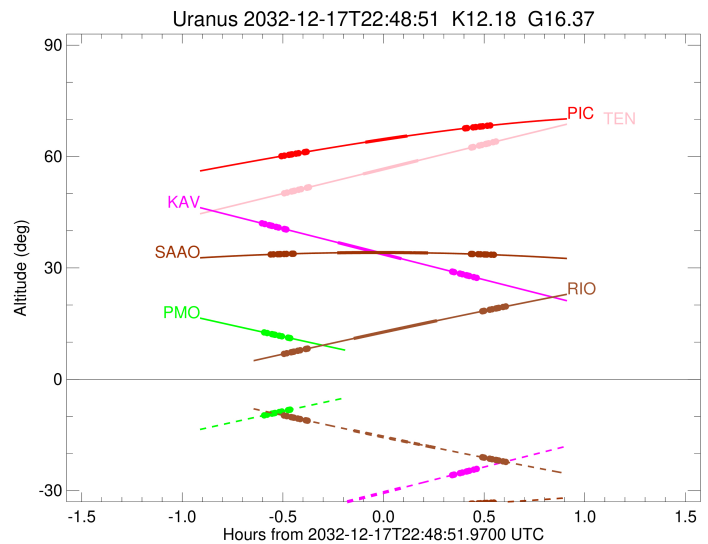
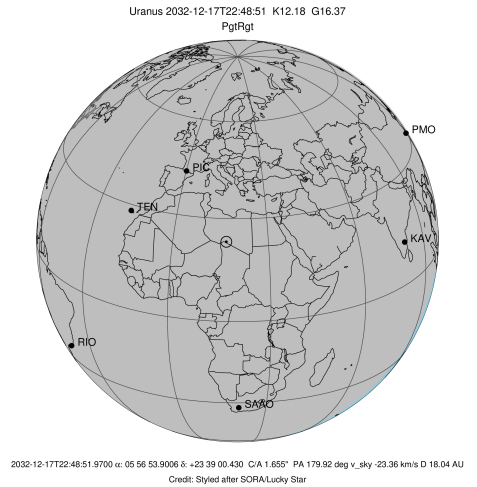
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-12-17T22:12:30.657		42.04	-38.85	51294.71	-21.96		
lambda	I	2032-12-17T22:13:28.751		41.82	-38.63	50026.71	-21.76		
delta	I	2032-12-17T22:14:48.411		41.51	-38.33	48300.35	-21.58		
gamma	I	2032-12-17T22:15:19.484		41.40	-38.21	47631.11	-21.50		
eta	I	2032-12-17T22:15:40.674		41.31	-38.13	47176.12	-21.44		
beta	I	2032-12-17T22:16:50.701		41.05	-37.86	45680.99	-21.25		
alpha	I	2032-12-17T22:17:34.612		40.88	-37.69	44752.26	-21.12		
4	I	2032-12-17T22:19:17.991		40.48	-37.30	42584.42	-20.76		
5	I	2032-12-17T22:19:31.608		40.43	-37.25	42306.52	-20.74		
6	I	2032-12-17T22:19:55.743		40.34	-37.15	41804.40	-20.64		
Uranus	I	2032-12-17T22:35:15.454		36.82	-33.64	25558.51		0.41	0.43
Uranus	E	2032-12-17T22:54:10.706		32.48	-29.30	25099.74		12.78	13.36
6	E	2032-12-17T23:09:22.154		28.99	-25.82	41876.31	20.57		
5	E	2032-12-17T23:09:39.079		28.93	-25.75	42233.24	20.66		
4	E	2032-12-17T23:09:53.060		28.87	-25.70	42526.85	20.69		
alpha	E	2032-12-17T23:11:37.452		28.47	-25.30	44703.60	21.04		
beta	E	2032-12-17T23:12:22.375		28.30	-25.13	45647.70	21.16		
eta	E	2032-12-17T23:13:34.218		28.03	-24.86	47176.12	21.36		
gamma	E	2032-12-17T23:13:55.055		27.95	-24.78	47621.67	21.41		
delta	E	2032-12-17T23:14:26.698		27.83	-24.66	48300.35	21.49		
lambda	E	2032-12-17T23:15:46.699		27.52	-24.35	50026.71	21.67		
epsilon	E	2032-12-17T23:16:47.221		27.29	-24.12	51341.99	21.86		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-17T22:52:40.200
 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 : 3424832317974689280
 2Mass ID (if available) : 05565390+2339004
 ICRS Star Coord at Epoch: 05h 56m 53.90055s +23:39:00.42952s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 12.178
 G magnitude : 16.372
 RP magnitude : 15.240
 BP magnitude : 17.723
 DUPflag : 0
 Distance (au) : 18.037
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.36
 Sun-Target sep (deg) : 176.81
 Sun-Moon sep (deg) : 11.53
 B (ring opening deg) : 75.94
 PA of pole (deg) : 55.09
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.391
 C/A sky separation (km) : 18203.5
 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	2032-12-17T22:19:06.514		6.82	-9.75	51272.70	-22.46		
lambda	I	2032-12-17T22:20:02.263		7.01	-9.93	50026.71	-22.31		
delta	I	2032-12-17T22:21:19.863		7.27	-10.19	48300.35	-22.18		
gamma	I	2032-12-17T22:21:50.062		7.37	-10.29	47631.23	-22.13		
eta	I	2032-12-17T22:22:10.645		7.44	-10.36	47176.12	-22.09		
beta	I	2032-12-17T22:23:18.496		7.67	-10.58	45681.16	-21.96		
alpha	I	2032-12-17T22:24:00.969		7.81	-10.72	44751.94	-21.88		
4	I	2032-12-17T22:25:40.319		8.14	-11.05	42587.66	-21.63		
5	I	2032-12-17T22:25:53.683		8.19	-11.09	42303.54	-21.62		
6	I	2032-12-17T22:26:16.734		8.26	-11.16	41802.41	-21.55		
Uranus	I	2032-12-17T22:39:59.385		10.99	-13.84	25544.01		-2.26	-2.37
Uranus	E	2032-12-17T23:04:48.854		15.79	-18.53	25029.07		13.77	14.40
6	E	2032-12-17T23:18:20.754		18.33	-21.01	41877.82	21.63		
5	E	2032-12-17T23:18:36.399		18.38	-21.06	42225.12	21.70		
4	E	2032-12-17T23:18:50.210		18.42	-21.10	42527.99	21.72		
alpha	E	2032-12-17T23:20:29.719		18.73	-21.40	44700.77	21.97		
beta	E	2032-12-17T23:21:12.859		18.86	-21.52	45646.37	22.05		
eta	E	2032-12-17T23:22:21.969		19.07	-21.73	47176.12	22.19		
gamma	E	2032-12-17T23:22:42.022		19.13	-21.79	47621.45	22.23		
delta	E	2032-12-17T23:23:12.529		19.23	-21.88	48300.35	22.28		
lambda	E	2032-12-17T23:24:29.778		19.46	-22.11	50026.71	22.41		
epsilon	E	2032-12-17T23:25:27.001		19.64	-22.28	51311.77	22.56		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-12-17T22:48:49.770
 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 : 3424832317974689280
 2Mass ID (if available) : 05565390+2339004
 ICRS Star Coord at Epoch: 05h 56m 53.90055s +23:39:00.42952s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 12.178
 G magnitude : 16.372
 RP magnitude : 15.240
 BP magnitude : 17.723
 DUPflag : 0
 Distance (au) : 18.037
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.36
 Sun-Target sep (deg) : 176.81
 Sun-Moon sep (deg) : 10.77
 B (ring opening deg) : 75.94
 PA of pole (deg) : 55.09
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.245
 C/A sky separation (km) : 16281.4
 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	2032-12-17T22:15:09.706		33.62	-34.24	51254.60	-23.02		
lambda	I	2032-12-17T22:16:03.249		33.65	-34.26	50026.71	-22.90		
delta	I	2032-12-17T22:17:18.801		33.69	-34.28	48300.35	-22.80		
gamma	I	2032-12-17T22:17:48.174		33.70	-34.29	47631.32	-22.76		
eta	I	2032-12-17T22:18:08.191		33.71	-34.29	47176.12	-22.73		
beta	I	2032-12-17T22:19:14.106		33.75	-34.31	45681.22	-22.62		
alpha	I	2032-12-17T22:19:55.352		33.76	-34.32	44751.58	-22.55		
4	I	2032-12-17T22:21:31.489		33.81	-34.34	42590.01	-22.36		
5	I	2032-12-17T22:21:44.639		33.81	-34.34	42301.07	-22.35		
6	I	2032-12-17T22:22:06.857		33.82	-34.34	41801.07	-22.29		
Uranus	I	2032-12-17T22:35:02.827		34.07	-34.41	25518.35		-3.73	-3.90
Uranus	E	2032-12-17T23:02:08.916		34.03	-33.98	25013.41		13.99	14.62
6	E	2032-12-17T23:14:57.756		33.75	-33.52	41878.34	22.29		
5	E	2032-12-17T23:15:12.761		33.74	-33.51	42221.63	22.35		
4	E	2032-12-17T23:15:26.387		33.74	-33.50	42528.62	22.36		
alpha	E	2032-12-17T23:17:03.079		33.69	-33.43	44699.61	22.55		
beta	E	2032-12-17T23:17:45.142		33.67	-33.40	45645.84	22.62		
eta	E	2032-12-17T23:18:52.591		33.63	-33.35	47176.12	22.73		
gamma	E	2032-12-17T23:19:12.169		33.62	-33.34	47621.37	22.76		
delta	E	2032-12-17T23:19:41.978		33.60	-33.31	48300.35	22.80		
lambda	E	2032-12-17T23:20:57.526		33.56	-33.25	50026.71	22.90		
epsilon	E	2032-12-17T23:21:53.005		33.53	-33.21	51299.14	23.03		