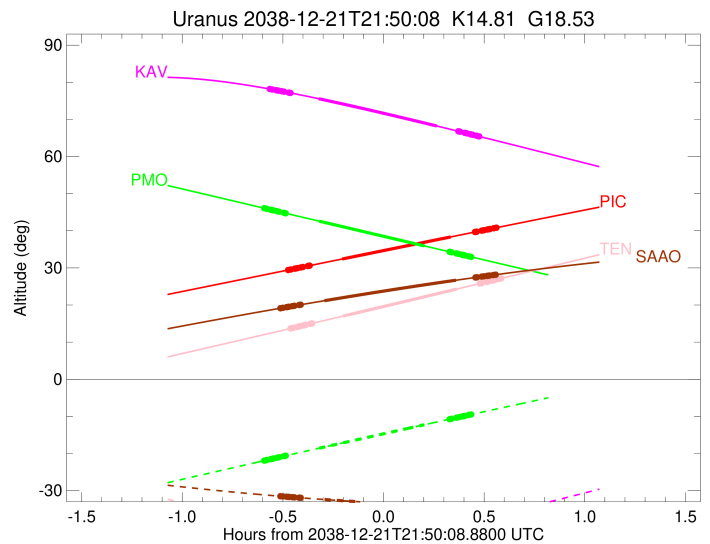
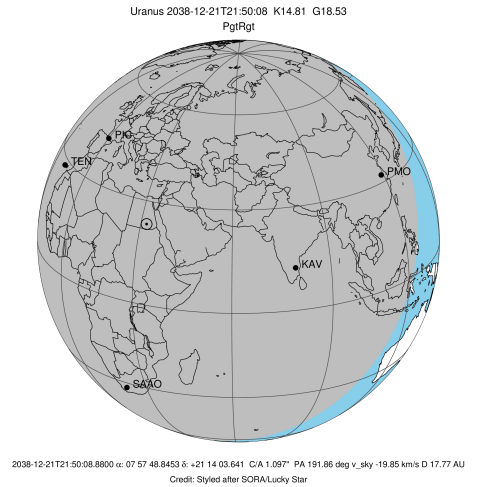
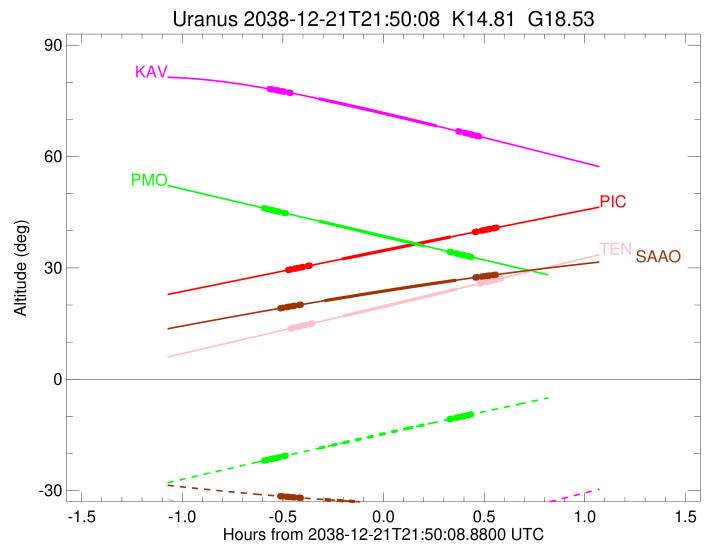
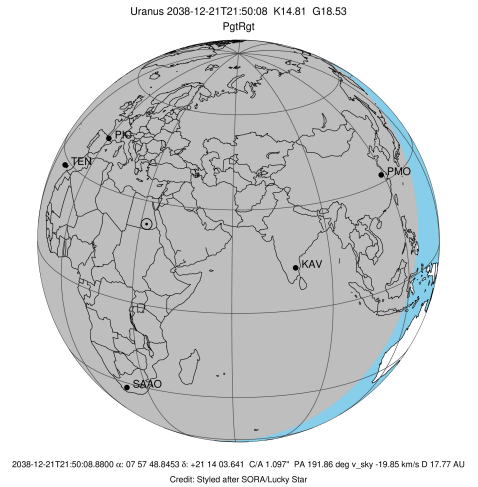


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-12-21T21:54:06.720
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 673883564198668288
 2Mass ID (if available) : 07574881+2114035
 ICRS Star Coord at Epoch: 07h 57m 48.84535s +21:14:03.64070s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.814
 G magnitude : 18.527
 RP magnitude : 17.330
 BP magnitude : 20.171
 DUPflag : 0
 Distance (au) : 17.772
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.85
 Sun-Target sep (deg) : 152.30
 Sun-Moon sep (deg) : 95.82
 B (ring opening deg) : 49.63
 PA of pole (deg) : 88.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.264
 C/A sky separation (km) : 16292.1
 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



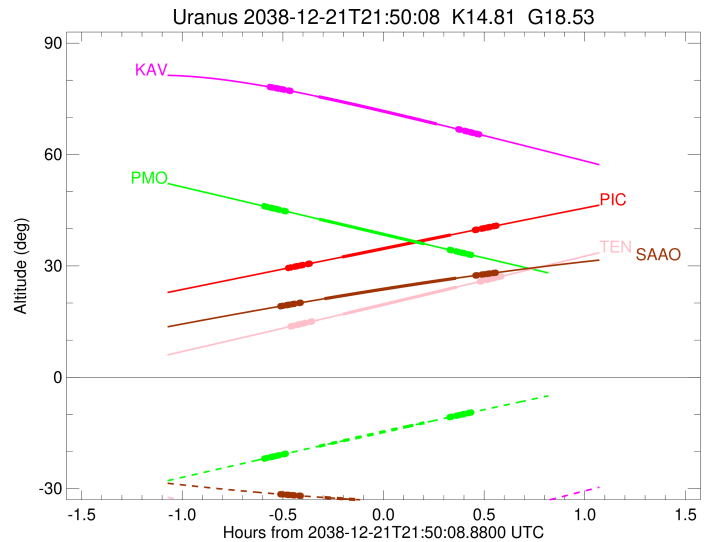
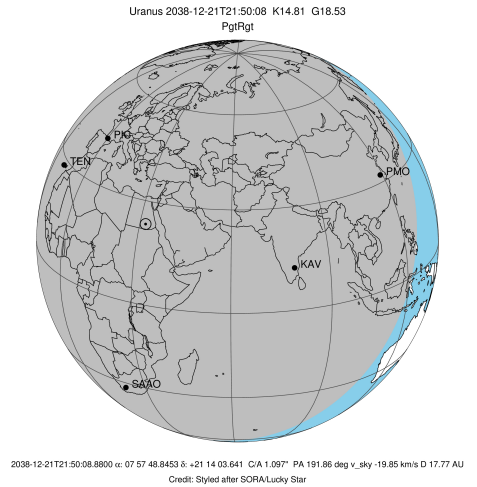
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-12-21T21:22:00.614		29.49	-52.59	50746.41	-24.52		
lambda	I	2038-12-21T21:22:29.985		29.58	-52.67	50026.71	-24.48		
delta	I	2038-12-21T21:23:40.650		29.79	-52.88	48300.35	-24.38		
gamma	I	2038-12-21T21:24:08.481		29.88	-52.96	47622.60	-24.33		
eta	I	2038-12-21T21:24:26.843		29.93	-53.01	47176.12	-24.30		
beta	I	2038-12-21T21:25:30.044		30.13	-53.19	45646.82	-24.19		
alpha	I	2038-12-21T21:26:09.031		30.25	-53.31	44697.02	-24.11		
4	I	2038-12-21T21:27:39.381		30.52	-53.57	42546.59	-23.91		
5	I	2038-12-21T21:27:55.120		30.57	-53.61	42175.02	-23.90		
6	I	2038-12-21T21:28:07.301		30.61	-53.65	41836.70	-23.83		
Uranus	I	2038-12-21T21:37:51.277		32.40	-55.31	25436.24		-22.81	-23.77
Uranus	E	2038-12-21T22:10:11.416		38.34	-60.58	25287.89		35.35	36.60
6	E	2038-12-21T22:17:27.414		39.67	-61.69	41868.41	23.91		
5	E	2038-12-21T22:17:43.252		39.72	-61.73	42315.01	23.99		
4	E	2038-12-21T22:17:54.128		39.75	-61.75	42561.16	24.00		
alpha	E	2038-12-21T22:19:25.802		40.03	-61.98	44752.15	24.20		
beta	E	2038-12-21T22:20:04.047		40.15	-62.08	45681.22	24.28		
eta	E	2038-12-21T22:21:05.577		40.34	-62.23	47176.12	24.40		
gamma	E	2038-12-21T22:21:24.029		40.39	-62.27	47626.56	24.43		
delta	E	2038-12-21T22:21:51.584		40.48	-62.34	48300.35	24.48		
lambda	E	2038-12-21T22:23:01.955		40.69	-62.51	50026.71	24.59		
epsilon	E	2038-12-21T22:23:59.198		40.86	-62.65	51436.57	24.62		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-12-21T21:46:42.440
 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 : 673883564198668288
 2Mass ID (if available) : 07574881+2114035
 ICRS Star Coord at Epoch: 07h 57m 48.84535s +21:14:03.64070s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.814
 G magnitude : 18.527
 RP magnitude : 17.330
 BP magnitude : 20.171
 DUPflag : 0
 Distance (au) : 17.772
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.85
 Sun-Target sep (deg) : 152.30
 Sun-Moon sep (deg) : 96.02
 B (ring opening deg) : 49.63
 PA of pole (deg) : 88.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.315
 C/A sky separation (km) : 16950.3
 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



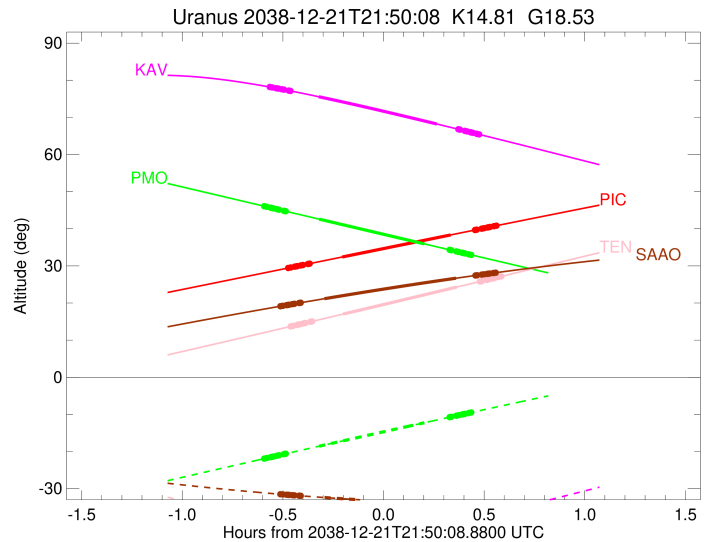
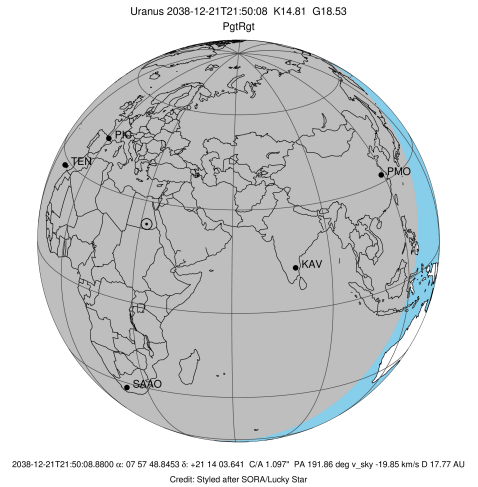
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-12-21T21:14:52.280		46.02	-21.86	50746.20	-24.54		
lambda	I	2038-12-21T21:15:21.621		45.92	-21.76	50026.71	-24.50		
delta	I	2038-12-21T21:16:32.262		45.67	-21.52	48300.35	-24.38		
gamma	I	2038-12-21T21:17:00.094		45.57	-21.42	47622.57	-24.33		
eta	I	2038-12-21T21:17:18.460		45.50	-21.36	47176.12	-24.29		
beta	I	2038-12-21T21:18:21.696		45.28	-21.14	45646.91	-24.17		
alpha	I	2038-12-21T21:19:00.723		45.14	-21.01	44697.19	-24.08		
4	I	2038-12-21T21:20:31.250		44.82	-20.70	42546.30	-23.86		
5	I	2038-12-21T21:20:46.992		44.76	-20.65	42175.44	-23.85		
6	I	2038-12-21T21:20:59.228		44.72	-20.60	41837.04	-23.77		
Uranus	I	2038-12-21T21:30:55.984		42.60	-18.58	25443.43		-22.09	-23.03
Uranus	E	2038-12-21T22:02:20.279		35.92	-12.25	25300.50		34.38	35.62
6	E	2038-12-21T22:09:53.431		34.32	-10.75	41869.13	23.69		
5	E	2038-12-21T22:10:09.410		34.27	-10.70	42314.83	23.77		
4	E	2038-12-21T22:10:20.351		34.23	-10.66	42560.06	23.78		
alpha	E	2038-12-21T22:11:52.870		33.90	-10.36	44752.25	24.00		
beta	E	2038-12-21T22:12:31.448		33.76	-10.23	45681.23	24.08		
eta	E	2038-12-21T22:13:33.482		33.55	-10.03	47176.12	24.20		
gamma	E	2038-12-21T22:13:52.077		33.48	-9.96	47626.43	24.23		
delta	E	2038-12-21T22:14:19.857		33.38	-9.87	48300.35	24.28		
lambda	E	2038-12-21T22:15:30.774		33.13	-9.64	50026.71	24.40		
epsilon	E	2038-12-21T22:16:28.189		32.93	-9.45	51430.17	24.44		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-12-21T21:55:08.410
 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 : 673883564198668288
 2Mass ID (if available) : 07574881+2114035
 ICRS Star Coord at Epoch: 07h 57m 48.84535s +21:14:03.64070s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.814
 G magnitude : 18.527
 RP magnitude : 17.330
 BP magnitude : 20.171
 DUPflag : 0
 Distance (au) : 17.772
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.85
 Sun-Target sep (deg) : 152.30
 Sun-Moon sep (deg) : 95.58
 B (ring opening deg) : 49.63
 PA of pole (deg) : 88.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.176
 C/A sky separation (km) : 15162.3
 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



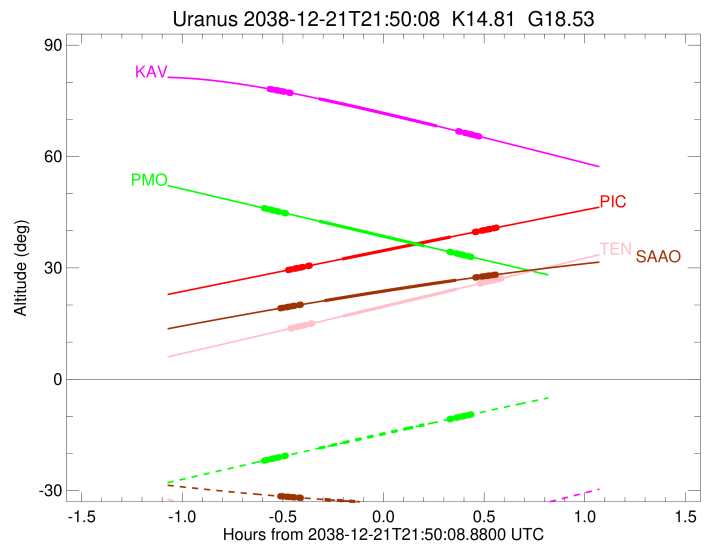
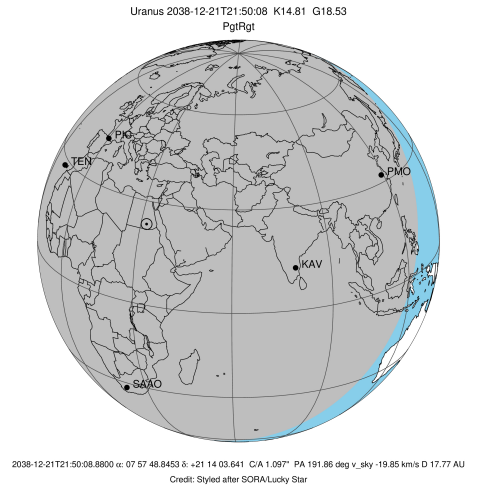
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-12-21T21:22:44.867		13.76	-40.35	50747.54	-24.60		
lambda	I	2038-12-21T21:23:14.178		13.86	-40.46	50026.71	-24.57		
delta	I	2038-12-21T21:24:24.554		14.11	-40.71	48300.35	-24.48		
gamma	I	2038-12-21T21:24:52.254		14.21	-40.81	47622.69	-24.44		
eta	I	2038-12-21T21:25:10.531		14.27	-40.88	47176.12	-24.42		
beta	I	2038-12-21T21:26:13.414		14.49	-41.11	45646.48	-24.33		
alpha	I	2038-12-21T21:26:52.186		14.63	-41.25	44696.36	-24.26		
4	I	2038-12-21T21:28:21.873		14.95	-41.58	42547.62	-24.09		
5	I	2038-12-21T21:28:37.612		15.00	-41.63	42173.60	-24.09		
6	I	2038-12-21T21:28:49.615		15.04	-41.68	41835.54	-24.02		
Uranus	I	2038-12-21T21:38:06.052		17.02	-43.71	25418.58		-24.51	-25.52
Uranus	E	2038-12-21T22:12:00.051		24.30	-51.15	25272.73		36.50	37.77
6	E	2038-12-21T22:18:56.360		25.80	-52.68	41867.49	24.13		
5	E	2038-12-21T22:19:12.068		25.86	-52.73	42315.17	24.20		
4	E	2038-12-21T22:19:22.894		25.90	-52.77	42562.53	24.21		
alpha	E	2038-12-21T22:20:53.792		26.23	-53.11	44752.02	24.38		
beta	E	2038-12-21T22:21:31.752		26.37	-53.25	45681.19	24.45		
eta	E	2038-12-21T22:22:32.879		26.59	-53.47	47176.12	24.55		
gamma	E	2038-12-21T22:22:51.222		26.65	-53.54	47626.70	24.58		
delta	E	2038-12-21T22:23:18.607		26.75	-53.64	48300.35	24.62		
lambda	E	2038-12-21T22:24:28.589		27.01	-53.90	50026.71	24.72		
epsilon	E	2038-12-21T22:25:25.837		27.21	-54.11	51443.78	24.75		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-12-21T21:48:28.020
 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 : 673883564198668288
 2Mass ID (if available) : 07574881+2114035
 ICRS Star Coord at Epoch: 07h 57m 48.84535s +21:14:03.64070s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.814
 G magnitude : 18.527
 RP magnitude : 17.330
 BP magnitude : 20.171
 DUPflag : 0
 Distance (au) : 17.772
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.85
 Sun-Target sep (deg) : 152.30
 Sun-Moon sep (deg) : 96.31
 B (ring opening deg) : 49.63
 PA of pole (deg) : 88.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.050
 C/A sky separation (km) : 13529.8
 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	2038-12-21T21:16:30.948		78.15	-52.00	50750.43	-25.35		
lambda	I	2038-12-21T21:16:59.508		78.07	-51.89	50026.71	-25.33		
delta	I	2038-12-21T21:18:07.773		77.88	-51.63	48300.35	-25.25		
gamma	I	2038-12-21T21:18:34.620		77.80	-51.53	47622.87	-25.22		
eta	I	2038-12-21T21:18:52.343		77.75	-51.47	47176.12	-25.20		
beta	I	2038-12-21T21:19:53.290		77.58	-51.24	45645.83	-25.12		
alpha	I	2038-12-21T21:20:30.854		77.47	-51.09	44695.13	-25.07		
4	I	2038-12-21T21:21:57.494		77.22	-50.77	42549.64	-24.93		
5	I	2038-12-21T21:22:12.923		77.17	-50.71	42171.01	-24.93		
6	I	2038-12-21T21:22:24.372		77.14	-50.67	41833.32	-24.86		
Uranus	I	2038-12-21T21:30:48.226		75.58	-48.76	25388.27		-27.24	-28.33
Uranus	E	2038-12-21T22:06:00.679		68.24	-40.73	25257.91		37.61	38.89
6	E	2038-12-21T22:12:30.097		66.80	-39.24	41866.49	24.83		
5	E	2038-12-21T22:12:45.378		66.74	-39.19	42315.24	24.90		
4	E	2038-12-21T22:12:55.950		66.71	-39.14	42563.96	24.90		
alpha	E	2038-12-21T22:14:24.367		66.38	-38.81	44751.84	25.03		
beta	E	2038-12-21T22:15:01.346		66.24	-38.67	45681.14	25.09		
eta	E	2038-12-21T22:16:00.963		66.02	-38.44	47176.12	25.16		
gamma	E	2038-12-21T22:16:18.869		65.95	-38.37	47626.85	25.18		
delta	E	2038-12-21T22:16:45.596		65.85	-38.27	48300.35	25.21		
lambda	E	2038-12-21T22:17:53.962		65.60	-38.01	50026.71	25.29		
epsilon	E	2038-12-21T22:18:50.198		65.39	-37.79	51450.44	25.31		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2038-12-21T21:52:13.430
 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 : 673883564198668288
 2Mass ID (if available) : 07574881+2114035
 ICRS Star Coord at Epoch: 07h 57m 48.84535s +21:14:03.64070s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 14.814
 G magnitude : 18.527
 RP magnitude : 17.330
 BP magnitude : 20.171
 DUPflag : 0
 Distance (au) : 17.772
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.85
 Sun-Target sep (deg) : 152.30
 Sun-Moon sep (deg) : 95.68
 B (ring opening deg) : 49.63
 PA of pole (deg) : 88.66
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.677
 C/A sky separation (km) : 8730.3
 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_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	2038-12-21T21:19:40.551		19.18	-31.53	50758.85	-25.69		
lambda	I	2038-12-21T21:20:09.040		19.25	-31.56	50026.71	-25.69		
delta	I	2038-12-21T21:21:16.270		19.43	-31.64	48300.35	-25.66		
gamma	I	2038-12-21T21:21:42.658		19.50	-31.68	47623.29	-25.65		
eta	I	2038-12-21T21:22:00.093		19.54	-31.70	47176.12	-25.64		
beta	I	2038-12-21T21:22:59.975		19.70	-31.77	45644.58	-25.62		
alpha	I	2038-12-21T21:23:36.853		19.79	-31.81	44692.67	-25.59		
4	I	2038-12-21T21:25:01.333		20.01	-31.91	42554.22	-25.55		
5	I	2038-12-21T21:25:16.838		20.05	-31.93	42165.98	-25.55		
6	I	2038-12-21T21:25:27.744		20.08	-31.94	41828.53	-25.50		
Uranus	I	2038-12-21T21:32:33.780		21.17	-32.40	25322.04		-32.71	-33.92
Uranus	E	2038-12-21T22:11:46.640		26.69	-34.09	25225.45		40.01	41.31
6	E	2038-12-21T22:17:34.832		27.42	-34.21	41862.37	25.58		
5	E	2038-12-21T22:17:49.758		27.45	-34.21	42314.76	25.63		
4	E	2038-12-21T22:18:00.231		27.48	-34.21	42569.55	25.63		
alpha	E	2038-12-21T22:19:26.093		27.66	-34.24	44750.87	25.68		
beta	E	2038-12-21T22:20:02.131		27.73	-34.25	45680.79	25.70		
eta	E	2038-12-21T22:21:00.393		27.85	-34.26	47176.12	25.73		
gamma	E	2038-12-21T22:21:17.927		27.89	-34.27	47627.43	25.74		
delta	E	2038-12-21T22:21:44.059		27.94	-34.27	48300.35	25.76		
lambda	E	2038-12-21T22:22:51.040		28.08	-34.29	50026.71	25.79		
epsilon	E	2038-12-21T22:23:47.244		28.19	-34.30	51476.93	25.79		