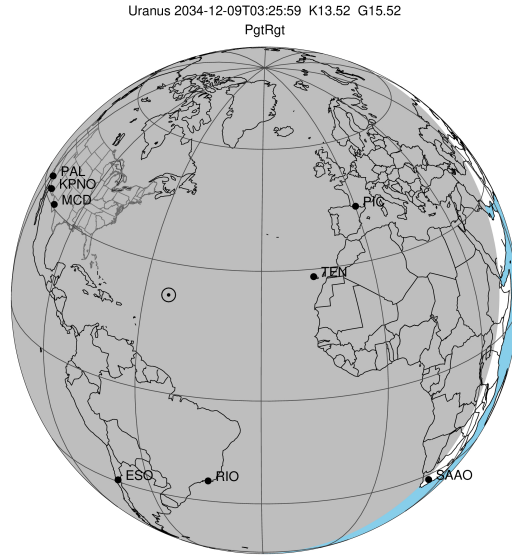


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-09T03:25:59.710  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3382771909404886528  
 2Mass ID (if available) : 06385496+2327575

ICRS Star Coord at Epoch: 06h 38m 54.98083s +23:27:57.45687s

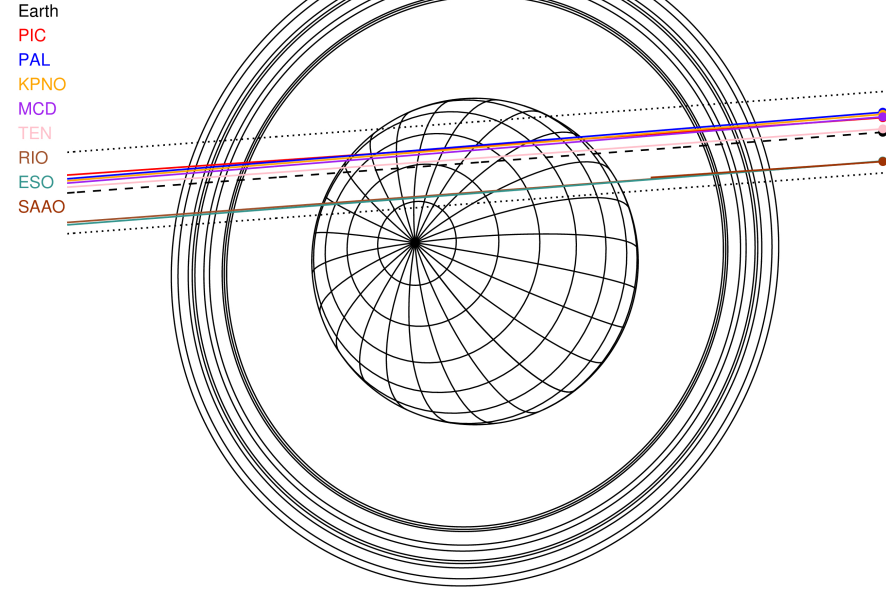
RUWE (>1.4 is poor) : 1.08  
 K magnitude : 13.524  
 G magnitude : 15.515  
 RP magnitude : 14.869  
 BP magnitude : 15.996  
 DUPflag : 0  
 Distance (au) : 17.978  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.16  
 Sun-Target sep (deg) : 157.71  
 Sun-Moon sep (deg) : 138.98  
 B (ring opening deg) : 67.32  
 PA of pole (deg) : 72.63

#	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



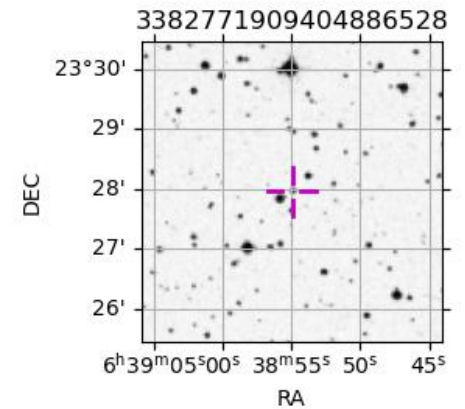
2034-12-09T03:25:59.7100 ra: 06 38 54.98083 s: +23 27 57.457 C/A 1.193° PA 184.26 deg v\_sky -21.16 km/s D 17.98 AU  
 Credit: Styled after SORA/Lucky Star

Uranus 2034-12-09T03:25:59 K13.52 G15.52 PgtRgt

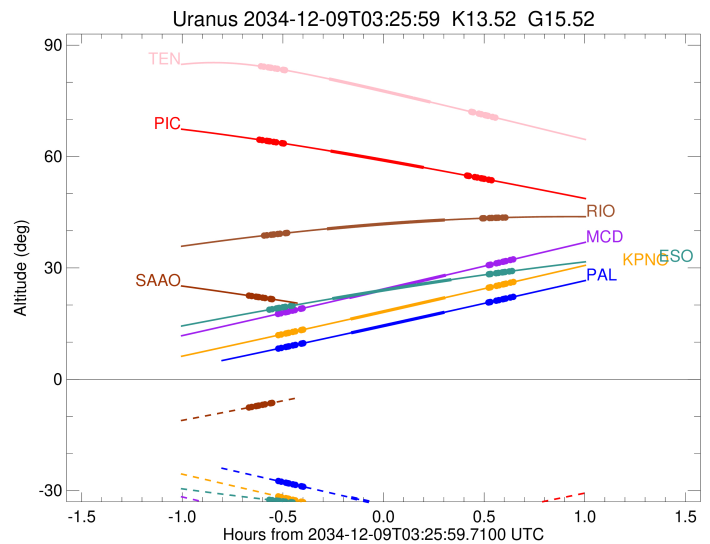
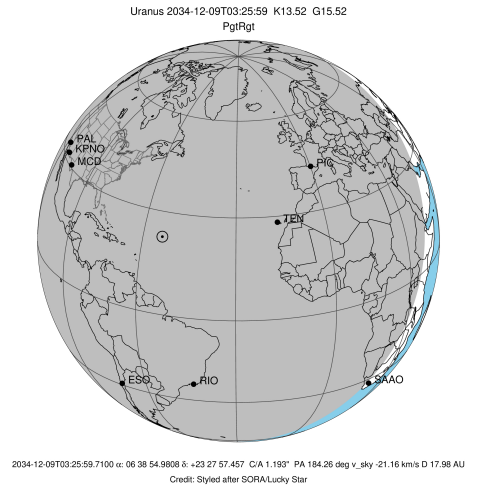


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	DEC 09 02:48 - DEC 09 03:57	PieRie
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	DEC 09 02:54 - DEC 09 04:04	PieRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	DEC 09 02:54 - DEC 09 04:04	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	DEC 09 02:54 - DEC 09 04:04	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+ +	+++++	DEC 09 02:49 - DEC 09 03:59	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	+++++	+ +	+++++	DEC 09 02:50 - DEC 09 04:02	PieRie
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	DEC 09 02:51 - DEC 09 04:04	PieRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++			DEC 09 02:45 - DEC 09 02:52	PnnRin
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

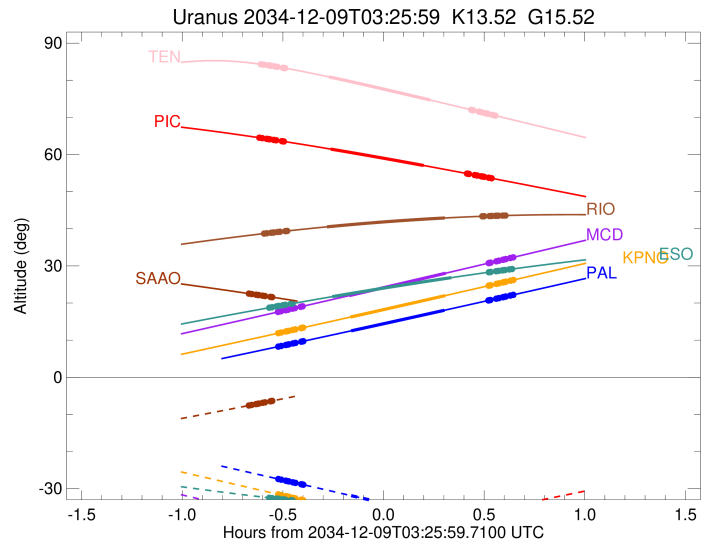
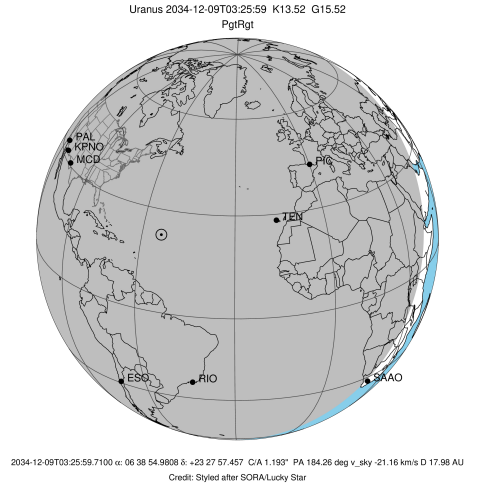


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-09T03:24:18.180  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 3382771909404886528  
 2Mass ID (if available) : 06385496+2327575  
 ICRS Star Coord at Epoch: 06h 38m 54.98083s +23:27:57.45687s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 13.524  
 G magnitude : 15.515  
 RP magnitude : 14.869  
 BP magnitude : 15.996  
 DUPflag : 0  
 Distance (au) : 17.978  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.16  
 Sun-Target sep (deg) : 157.71  
 Sun-Moon sep (deg) : 139.74  
 B (ring opening deg) : 67.32  
 PA of pole (deg) : 72.63  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.377  
 C/A sky separation (km) : 17950.0  
 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



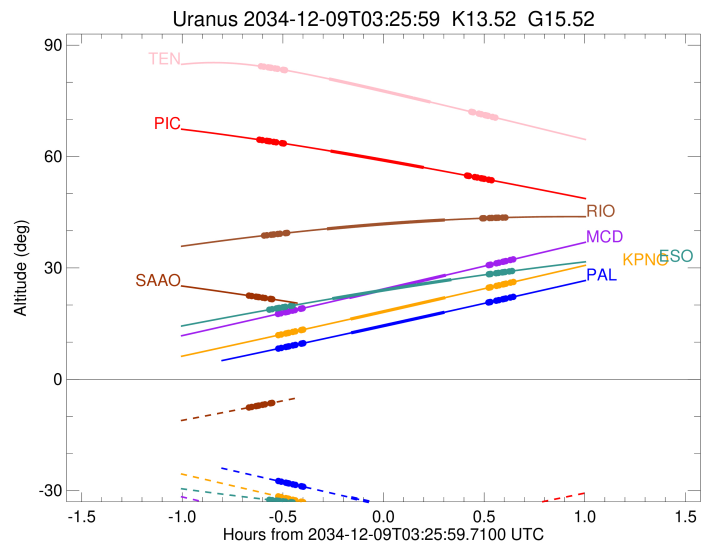
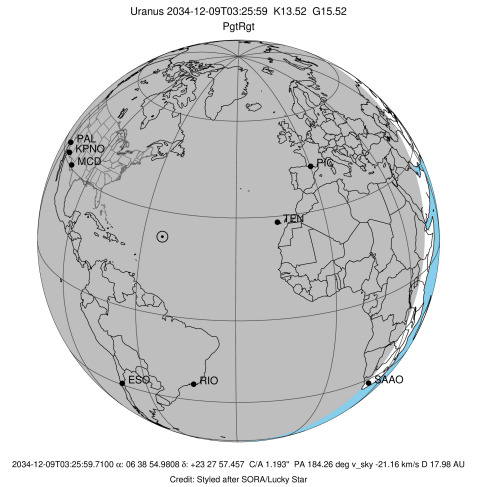
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-09T02:48:41.657		64.57	-48.40	51519.91	-21.53		
lambda	I	2034-12-09T02:49:51.072		64.41	-48.19	50026.71	-21.46		
delta	I	2034-12-09T02:51:11.724		64.23	-47.95	48300.35	-21.34		
gamma	I	2034-12-09T02:51:43.581		64.16	-47.86	47621.18	-21.29		
eta	I	2034-12-09T02:52:04.499		64.11	-47.79	47176.12	-21.26		
beta	I	2034-12-09T02:53:15.070		63.95	-47.58	45679.96	-21.14		
alpha	I	2034-12-09T02:54:01.850		63.84	-47.44	44690.20	-21.05		
4	I	2034-12-09T02:55:40.700		63.61	-47.15	42616.32	-20.83		
5	I	2034-12-09T02:56:03.007		63.55	-47.08	42160.23	-20.80		
6	I	2034-12-09T02:56:16.490		63.52	-47.04	41876.61	-20.75		
Uranus	I	2034-12-09T03:10:15.600		61.47	-44.52	25475.88		-8.95	-9.37
Uranus	E	2034-12-09T03:37:59.051		57.05	-39.48	25142.47		20.60	21.49
6	E	2034-12-09T03:50:50.404		54.88	-37.12	41800.21	20.72		
5	E	2034-12-09T03:51:14.625		54.81	-37.05	42304.60	20.76		
4	E	2034-12-09T03:51:27.210		54.77	-37.01	42546.18	20.80		
alpha	E	2034-12-09T03:53:12.481		54.47	-36.69	44751.33	21.01		
beta	E	2034-12-09T03:53:55.314		54.35	-36.56	45653.43	21.10		
eta	E	2034-12-09T03:55:07.211		54.14	-36.34	47176.12	21.22		
gamma	E	2034-12-09T03:55:28.627		54.08	-36.27	47630.95	21.26		
delta	E	2034-12-09T03:56:00.083		53.99	-36.18	48300.35	21.31		
lambda	E	2034-12-09T03:57:20.886		53.76	-35.93	50026.71	21.42		
epsilon	E	2034-12-09T03:57:55.195		53.66	-35.82	50762.50	21.49		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-09T03:30:28.080  
 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 : 3382771909404886528  
 2Mass ID (if available) : 06385496+2327575  
 ICRS Star Coord at Epoch: 06h 38m 54.98083s +23:27:57.45687s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 13.524  
 G magnitude : 15.515  
 RP magnitude : 14.869  
 BP magnitude : 15.996  
 DUPflag : 0  
 Distance (au) : 17.978  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.16  
 Sun-Target sep (deg) : 157.71  
 Sun-Moon sep (deg) : 138.59  
 B (ring opening deg) : 67.32  
 PA of pole (deg) : 72.63  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.387  
 C/A sky separation (km) : 18090.0  
 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



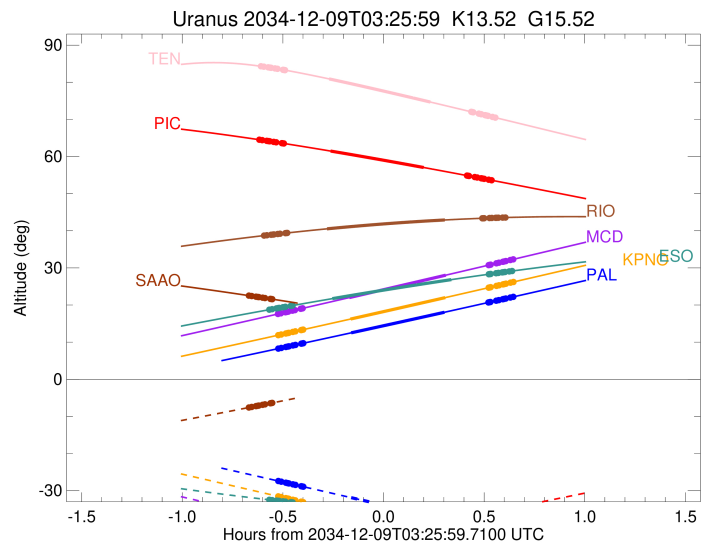
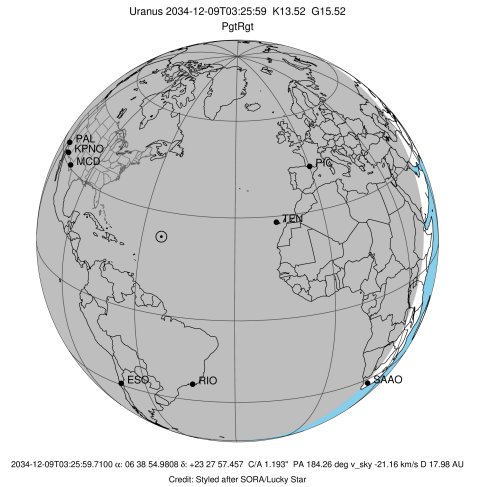
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-09T02:54:21.120		8.21	-27.35	51517.62	-21.15		
lambda	I	2034-12-09T02:55:31.676		8.44	-27.59	50026.71	-21.08		
delta	I	2034-12-09T02:56:53.776		8.70	-27.87	48300.35	-20.97		
gamma	I	2034-12-09T02:57:26.203		8.81	-27.98	47621.21	-20.92		
eta	I	2034-12-09T02:57:47.498		8.87	-28.06	47176.12	-20.88		
beta	I	2034-12-09T02:58:59.328		9.11	-28.30	45680.05	-20.76		
alpha	I	2034-12-09T02:59:46.939		9.26	-28.47	44690.46	-20.68		
4	I	2034-12-09T03:01:27.573		9.59	-28.81	42616.39	-20.47		
5	I	2034-12-09T03:01:50.248		9.66	-28.89	42160.65	-20.43		
6	I	2034-12-09T03:02:04.007		9.71	-28.94	41876.38	-20.38		
Uranus	I	2034-12-09T03:16:20.698		12.51	-31.89	25482.79		-8.57	-8.97
Uranus	E	2034-12-09T03:44:11.398		18.05	-37.68	25141.25		20.63	21.52
6	E	2034-12-09T03:57:13.407		20.68	-40.40	41800.08	20.48		
5	E	2034-12-09T03:57:37.924		20.77	-40.48	42304.86	20.53		
4	E	2034-12-09T03:57:50.628		20.81	-40.53	42545.93	20.57		
alpha	E	2034-12-09T03:59:37.088		21.17	-40.90	44751.39	20.78		
beta	E	2034-12-09T04:00:20.376		21.31	-41.05	45653.30	20.87		
eta	E	2034-12-09T04:01:33.045		21.56	-41.30	47176.12	21.00		
gamma	E	2034-12-09T04:01:54.686		21.63	-41.38	47630.97	21.04		
delta	E	2034-12-09T04:02:26.467		21.74	-41.49	48300.35	21.09		
lambda	E	2034-12-09T04:03:48.094		22.02	-41.77	50026.71	21.21		
epsilon	E	2034-12-09T04:04:22.703		22.14	-41.89	50761.60	21.28		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-09T03:30:28.160  
 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 : 3382771909404886528  
 2Mass ID (if available) : 06385496+2327575  
 ICRS Star Coord at Epoch: 06h 38m 54.98083s +23:27:57.45687s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 13.524  
 G magnitude : 15.515  
 RP magnitude : 14.869  
 BP magnitude : 15.996  
 DUPflag : 0  
 Distance (au) : 17.978  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.16  
 Sun-Target sep (deg) : 157.71  
 Sun-Moon sep (deg) : 138.62  
 B (ring opening deg) : 67.32  
 PA of pole (deg) : 72.63  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.363  
 C/A sky separation (km) : 17770.6  
 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\_itrfr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



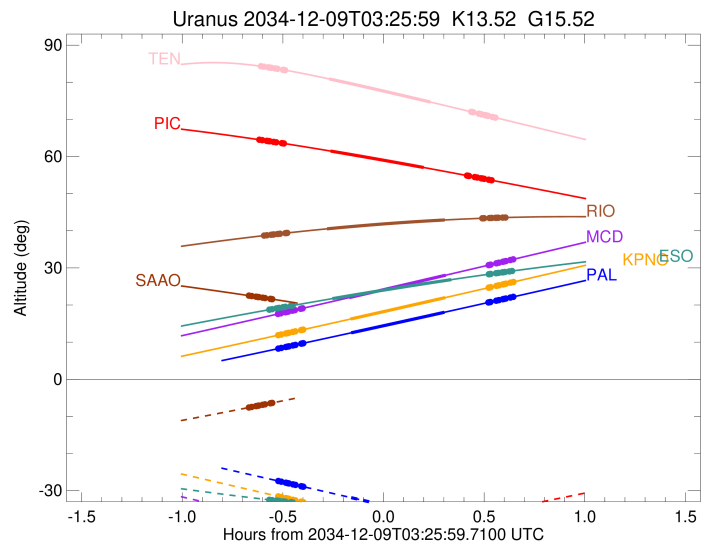
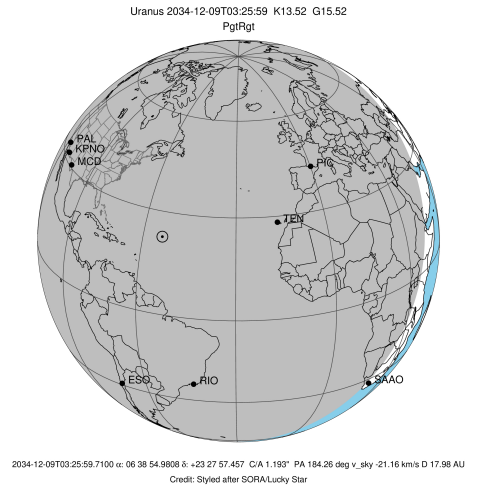
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-12-09T02:54:20.358		11.83	-31.49	51518.77	-21.24		
lambda	I	2034-12-09T02:55:30.665		12.06	-31.73	50026.71	-21.18		
delta	I	2034-12-09T02:56:52.395		12.33	-32.02	48300.35	-21.07		
gamma	I	2034-12-09T02:57:24.671		12.44	-32.13	47621.19	-21.02		
eta	I	2034-12-09T02:57:45.864		12.51	-32.21	47176.12	-20.99		
beta	I	2034-12-09T02:58:57.344		12.75	-32.46	45680.00	-20.87		
alpha	I	2034-12-09T02:59:44.716		12.91	-32.62	44690.31	-20.79		
4	I	2034-12-09T03:01:24.798		13.24	-32.97	42616.35	-20.58		
5	I	2034-12-09T03:01:47.363		13.32	-33.05	42160.40	-20.55		
6	I	2034-12-09T03:02:01.022		13.36	-33.10	41876.52	-20.50		
Uranus	I	2034-12-09T03:16:07.758		16.21	-36.07	25476.35		-8.93	-9.34
Uranus	E	2034-12-09T03:44:24.922		22.00	-42.06	25134.93		20.80	21.69
6	E	2034-12-09T03:57:18.320		24.66	-44.80	41799.91	20.60		
5	E	2034-12-09T03:57:42.716		24.75	-44.88	42305.19	20.65		
4	E	2034-12-09T03:57:55.318		24.79	-44.93	42545.62	20.68		
alpha	E	2034-12-09T03:59:41.215		25.16	-45.30	44751.46	20.89		
beta	E	2034-12-09T04:00:24.268		25.31	-45.46	45653.16	20.98		
eta	E	2034-12-09T04:01:36.586		25.56	-45.71	47176.12	21.10		
gamma	E	2034-12-09T04:01:58.124		25.63	-45.79	47630.99	21.14		
delta	E	2034-12-09T04:02:29.756		25.74	-45.90	48300.35	21.19		
lambda	E	2034-12-09T04:03:51.014		26.02	-46.19	50026.71	21.30		
epsilon	E	2034-12-09T04:04:25.435		26.14	-46.31	50760.81	21.37		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-09T03:30:22.380  
 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 : 3382771909404886528  
 2Mass ID (if available) : 06385496+2327575  
 ICRS Star Coord at Epoch: 06h 38m 54.98083s +23:27:57.45687s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 13.524  
 G magnitude : 15.515  
 RP magnitude : 14.869  
 BP magnitude : 15.996  
 DUPflag : 0  
 Distance (au) : 17.978  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.16  
 Sun-Target sep (deg) : 157.71  
 Sun-Moon sep (deg) : 138.68  
 B (ring opening deg) : 67.32  
 PA of pole (deg) : 72.63  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.333  
 C/A sky separation (km) : 17380.5  
 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	2034-12-09T02:54:14.577		17.53	-37.72	51520.19	-21.36		
lambda	I	2034-12-09T02:55:24.556		17.77	-37.97	50026.71	-21.30		
delta	I	2034-12-09T02:56:45.810		18.05	-38.26	48300.35	-21.19		
gamma	I	2034-12-09T02:57:17.893		18.16	-38.38	47621.18	-21.15		
eta	I	2034-12-09T02:57:38.955		18.23	-38.45	47176.12	-21.12		
beta	I	2034-12-09T02:58:49.987		18.48	-38.70	45679.93	-21.00		
alpha	I	2034-12-09T02:59:37.054		18.64	-38.87	44690.13	-20.92		
4	I	2034-12-09T03:01:16.436		18.98	-39.23	42616.30	-20.73		
5	I	2034-12-09T03:01:38.861		19.06	-39.31	42160.09	-20.70		
6	I	2034-12-09T03:01:52.396		19.11	-39.36	41876.69	-20.66		
Uranus	I	2034-12-09T03:15:47.146		22.00	-42.34	25468.29		-9.36	-9.79
Uranus	E	2034-12-09T03:44:34.536		28.04	-48.53	25127.70		20.99	21.89
6	E	2034-12-09T03:57:17.697		30.74	-51.27	41799.70	20.75		
5	E	2034-12-09T03:57:41.943		30.82	-51.36	42305.57	20.80		
4	E	2034-12-09T03:57:54.418		30.87	-51.41	42545.25	20.83		
alpha	E	2034-12-09T03:59:39.613		31.24	-51.78	44751.53	21.03		
beta	E	2034-12-09T04:00:22.374		31.39	-51.94	45652.99	21.11		
eta	E	2034-12-09T04:01:34.251		31.65	-52.19	47176.12	21.23		
gamma	E	2034-12-09T04:01:55.660		31.72	-52.27	47631.01	21.26		
delta	E	2034-12-09T04:02:27.104		31.83	-52.38	48300.35	21.31		
lambda	E	2034-12-09T04:03:47.895		32.12	-52.67	50026.71	21.42		
epsilon	E	2034-12-09T04:04:22.083		32.24	-52.80	50759.90	21.49		

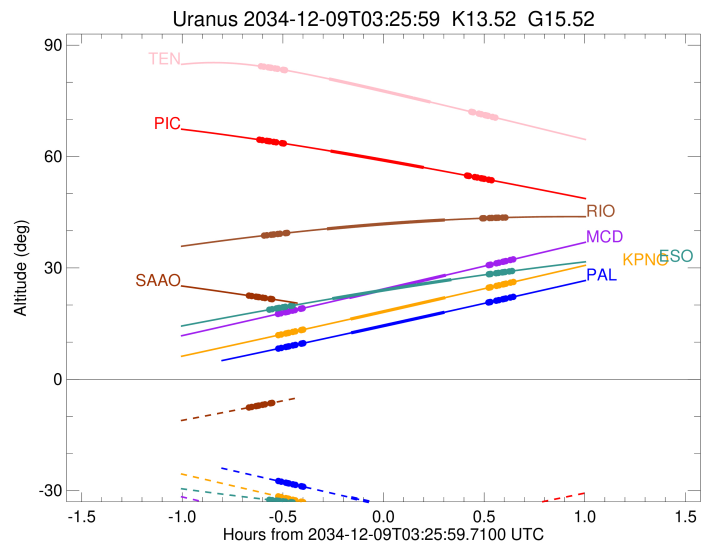
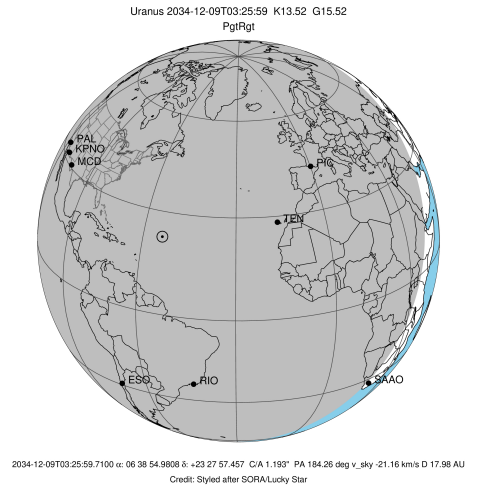
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-09T03:25:02.290  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : TEN  
 Location : Teide Obs./Tenerife  
 Latitude (deg) : 28.30050  
 E. Longitude (deg) : 343.48909  
 Altitude (km) : 2.395  
 Gaia source ID : 3382771909404886528  
 2Mass ID (if available) : 06385496+2327575  
 ICRS Star Coord at Epoch: 06h 38m 54.98083s +23:27:57.45687s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 13.524  
 G magnitude : 15.515  
 RP magnitude : 14.869  
 BP magnitude : 15.996  
 DUPflag : 0  
 Distance (au) : 17.978  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.16  
 Sun-Target sep (deg) : 157.71  
 Sun-Moon sep (deg) : 139.69  
 B (ring opening deg) : 67.32  
 PA of pole (deg) : 72.63  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.236  
 C/A sky separation (km) : 16109.5  
 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\_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	2034-12-09T02:49:11.042		84.35	-64.43	51525.85	-21.92		
lambda	I	2034-12-09T02:50:19.474		84.20	-64.18	50026.71	-21.87		
delta	I	2034-12-09T02:51:38.583		84.03	-63.89	48300.35	-21.77		
gamma	I	2034-12-09T02:52:09.806		83.95	-63.78	47621.12	-21.73		
eta	I	2034-12-09T02:52:30.294		83.90	-63.71	47176.12	-21.71		
beta	I	2034-12-09T02:53:39.377		83.73	-63.45	45679.64	-21.61		
alpha	I	2034-12-09T02:54:25.133		83.62	-63.28	44689.41	-21.54		
4	I	2034-12-09T02:56:01.585		83.37	-62.93	42616.06	-21.37		
5	I	2034-12-09T02:56:23.418		83.31	-62.85	42158.95	-21.34		
6	I	2034-12-09T02:56:36.455		83.28	-62.80	41877.33	-21.30		
Uranus	I	2034-12-09T03:09:49.112		80.90	-59.90	25437.52		-10.86	-11.36
Uranus	E	2034-12-09T03:39:55.912		74.69	-53.26	25109.67		21.46	22.37
6	E	2034-12-09T03:52:07.247		72.06	-50.58	41799.23	21.29		
5	E	2034-12-09T03:52:30.947		71.97	-50.49	42306.47	21.32		
4	E	2034-12-09T03:52:43.030		71.93	-50.45	42544.38	21.35		
alpha	E	2034-12-09T03:54:25.784		71.55	-50.07	44751.69	21.52		
beta	E	2034-12-09T03:55:07.555		71.40	-49.92	45652.60	21.59		
eta	E	2034-12-09T03:56:17.896		71.15	-49.66	47176.12	21.69		
gamma	E	2034-12-09T03:56:38.858		71.07	-49.58	47631.05	21.72		
delta	E	2034-12-09T03:57:09.649		70.96	-49.47	48300.35	21.76		
lambda	E	2034-12-09T03:58:28.826		70.67	-49.18	50026.71	21.85		
epsilon	E	2034-12-09T03:59:02.264		70.55	-49.06	50757.96	21.90		

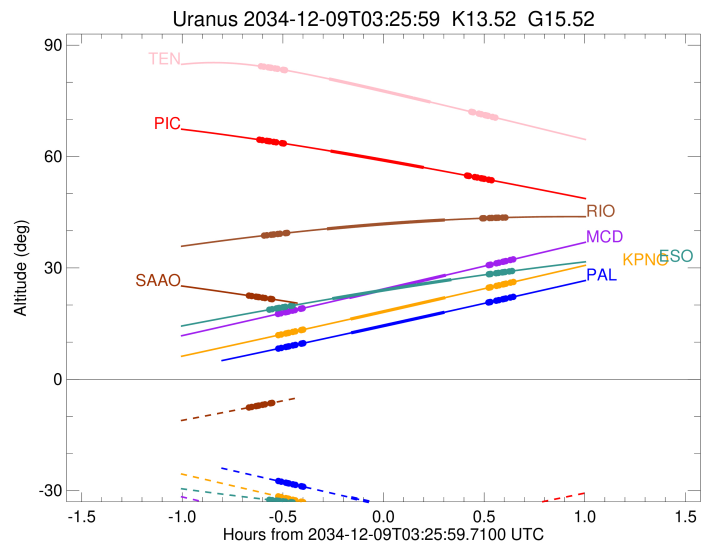
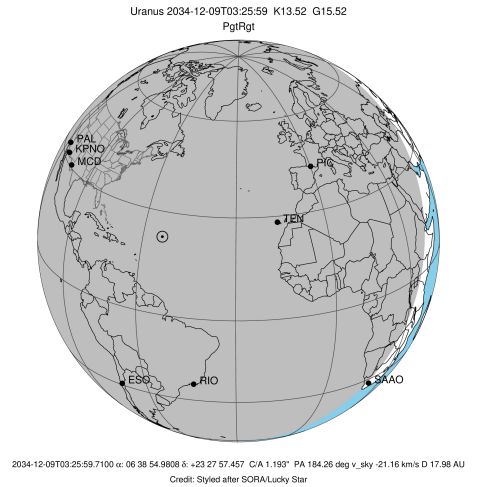
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2034-12-09T03:26:49.350
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       : 3382771909404886528
2Mass ID (if available) : 06385496+2327575
ICRS Star Coord at Epoch: 06h 38m 54.98083s +23:27:57.45687s
RUWE (>1.4 is poor) : 1.08
K magnitude          : 13.524
G magnitude          : 15.515
RP magnitude         : 14.869
BP magnitude         : 15.996
DUPflag             : 0
Distance (au)        : 17.978
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -21.16
Sun-Target sep (deg) : 157.71
Sun-Moon sep (deg)   : 139.19
B (ring opening deg) : 67.32
PA of pole (deg)     : 72.63
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.829
C/A sky separation (km) : 10813.1
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.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	2034-12-09T02:50:06.731		38.68	-44.42	51539.71	-22.58		
lambda	I	2034-12-09T02:51:13.761		38.80	-44.41	50026.71	-22.56		
delta	I	2034-12-09T02:52:30.366		38.93	-44.40	48300.35	-22.52		
gamma	I	2034-12-09T02:53:00.550		38.98	-44.40	47621.01	-22.50		
eta	I	2034-12-09T02:53:20.330		39.02	-44.39	47176.12	-22.49		
beta	I	2034-12-09T02:54:26.969		39.13	-44.38	45678.57	-22.44		
alpha	I	2034-12-09T02:55:11.020		39.21	-44.37	44687.50	-22.41		
4	I	2034-12-09T02:56:43.443		39.36	-44.35	42614.81	-22.34		
5	I	2034-12-09T02:57:04.494		39.40	-44.34	42156.29	-22.33		
6	I	2034-12-09T02:57:16.750		39.42	-44.34	41878.84	-22.32		
Uranus	I	2034-12-09T03:09:07.851		40.52	-44.06	25323.28		-15.26	-15.95
Uranus	E	2034-12-09T03:44:17.049		42.91	-42.21	25063.29		22.63	23.58
6	E	2034-12-09T03:55:24.288		43.36	-41.33	41796.97	22.35		
5	E	2034-12-09T03:55:47.141		43.38	-41.29	42310.79	22.37		
4	E	2034-12-09T03:55:58.238		43.38	-41.28	42539.68	22.37		
alpha	E	2034-12-09T03:57:36.744		43.44	-41.14	44752.32	22.45		
beta	E	2034-12-09T03:58:16.665		43.46	-41.08	45650.39	22.48		
eta	E	2034-12-09T03:59:24.412		43.49	-40.98	47176.12	22.52		
gamma	E	2034-12-09T03:59:44.614		43.50	-40.95	47631.29	22.54		
delta	E	2034-12-09T04:00:14.289		43.51	-40.90	48300.35	22.55		
lambda	E	2034-12-09T04:01:30.757		43.55	-40.78	50026.71	22.60		
epsilon	E	2034-12-09T04:02:02.684		43.56	-40.74	50748.44	22.62		

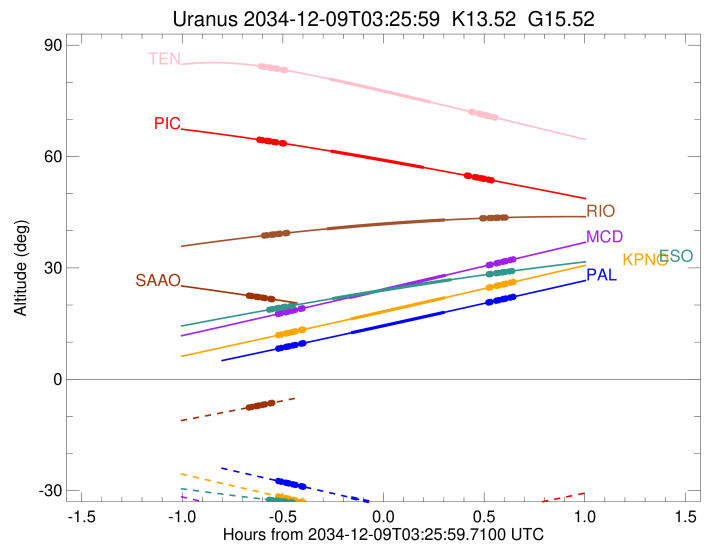
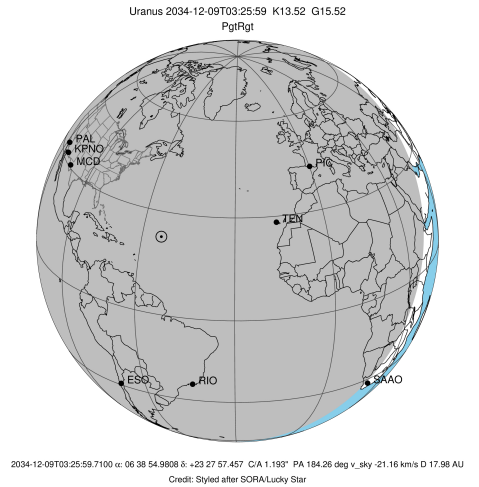
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-09T03:28:36.760  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : ESO  
 Location : European Southern Obs. (3.6m)  
 Latitude (deg) : -29.26097  
 E. Longitude (deg) : 289.26831  
 Altitude (km) : 2.400  
 Gaia source ID : 3382771909404886528  
 2Mass ID (if available) : 06385496+2327575  
 ICRS Star Coord at Epoch: 06h 38m 54.98083s +23:27:57.45687s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 13.524  
 G magnitude : 15.515  
 RP magnitude : 14.869  
 BP magnitude : 15.996  
 DUPflag : 0  
 Distance (au) : 17.978  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.16  
 Sun-Target sep (deg) : 157.71  
 Sun-Moon sep (deg) : 138.80  
 B (ring opening deg) : 67.32  
 PA of pole (deg) : 72.63  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.817  
 C/A sky separation (km) : 10651.4  
 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\_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	2034-12-09T02:51:40.450		18.70	-32.44	51539.73	-22.45		
lambda	I	2034-12-09T02:52:47.848		18.88	-32.56	50026.71	-22.43		
delta	I	2034-12-09T02:54:04.866		19.09	-32.69	48300.35	-22.40		
gamma	I	2034-12-09T02:54:35.211		19.17	-32.74	47621.01	-22.38		
eta	I	2034-12-09T02:54:55.095		19.22	-32.78	47176.12	-22.37		
beta	I	2034-12-09T02:56:02.083		19.40	-32.89	45678.57	-22.33		
alpha	I	2034-12-09T02:56:46.361		19.52	-32.96	44687.50	-22.30		
4	I	2034-12-09T02:58:19.250		19.77	-33.12	42614.80	-22.23		
5	I	2034-12-09T02:58:40.406		19.83	-33.15	42156.28	-22.22		
6	I	2034-12-09T02:58:52.721		19.86	-33.17	41878.85	-22.21		
Uranus	I	2034-12-09T03:10:46.377		21.73	-34.27	25321.46		-15.33	-16.01
Uranus	E	2034-12-09T03:46:12.744		26.84	-36.78	25062.64		22.64	23.60
6	E	2034-12-09T03:57:21.526		28.29	-37.31	41796.87	22.28		
5	E	2034-12-09T03:57:44.457		28.34	-37.32	42310.98	22.30		
4	E	2034-12-09T03:57:55.565		28.36	-37.33	42539.45	22.31		
alpha	E	2034-12-09T03:59:34.374		28.57	-37.40	44752.34	22.38		
beta	E	2034-12-09T04:00:14.407		28.65	-37.42	45650.27	22.41		
eta	E	2034-12-09T04:01:22.364		28.79	-37.46	47176.12	22.46		
gamma	E	2034-12-09T04:01:42.627		28.83	-37.48	47631.31	22.47		
delta	E	2034-12-09T04:02:12.392		28.90	-37.49	48300.35	22.49		
lambda	E	2034-12-09T04:03:29.091		29.05	-37.54	50026.71	22.53		
epsilon	E	2034-12-09T04:04:01.098		29.12	-37.56	50748.04	22.55		



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-12-09T03:22:27.450  
 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 : 3382771909404886528  
 2Mass ID (if available) : 06385496+2327575  
 ICRS Star Coord at Epoch: 06h 38m 54.98083s +23:27:57.45687s  
 RUWE (>1.4 is poor) : 1.08  
 K magnitude : 13.524  
 G magnitude : 15.515  
 RP magnitude : 14.869  
 BP magnitude : 15.996  
 DUPflag : 0  
 Distance (au) : 17.978  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -21.16  
 Sun-Target sep (deg) : 157.71  
 Sun-Moon sep (deg) : 139.56  
 B (ring opening deg) : 67.32  
 PA of pole (deg) : 72.63  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.863  
 C/A sky separation (km) : 11252.8  
 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	2034-12-09T02:45:34.848		22.57	-7.66	51539.48	-22.43		
lambda	I	2034-12-09T02:46:42.314		22.42	-7.46	50026.71	-22.40		
delta	I	2034-12-09T02:47:59.448		22.24	-7.23	48300.35	-22.36		
gamma	I	2034-12-09T02:48:29.846		22.18	-7.14	47621.01	-22.34		
eta	I	2034-12-09T02:48:49.768		22.13	-7.08	47176.12	-22.32		
beta	I	2034-12-09T02:49:56.897		21.98	-6.88	45678.61	-22.28		
alpha	I	2034-12-09T02:50:41.281		21.87	-6.75	44687.55	-22.24		
4	I	2034-12-09T02:52:14.432		21.66	-6.47	42614.86	-22.16		
5	I	2034-12-09T02:52:35.651		21.61	-6.41	42156.36	-22.15		
6	I	2034-12-09T02:52:48.012		21.58	-6.37	41878.80	-22.13		
Uranus	I	2034-12-09T03:04:47.783		19.87	-4.20x	25329.34		-15.06	-15.74
Uranus	E	2034-12-09T03:39:54.366		14.47	2.35x	25065.34		22.58	23.53
6	E	2034-12-09T03:51:11.606		12.62	4.52x	41797.20	22.06		
5	E	2034-12-09T03:51:34.728		12.56	4.59x	42310.33	22.08		
4	E	2034-12-09T03:51:46.020		12.52	4.63x	42540.23	22.09		
alpha	E	2034-12-09T03:53:25.771		12.25	4.95x	44752.27	22.17		
beta	E	2034-12-09T03:54:06.221		12.14	5.08x	45650.66	22.20		
eta	E	2034-12-09T03:55:14.816		11.94	5.30x	47176.12	22.24		
gamma	E	2034-12-09T03:55:35.273		11.89	5.37x	47631.27	22.26		
delta	E	2034-12-09T03:56:05.324		11.80	5.47x	48300.35	22.27		
lambda	E	2034-12-09T03:57:22.754		11.59	5.72x	50026.71	22.32		
epsilon	E	2034-12-09T03:57:55.126		11.50	5.82x	50749.42	22.34		