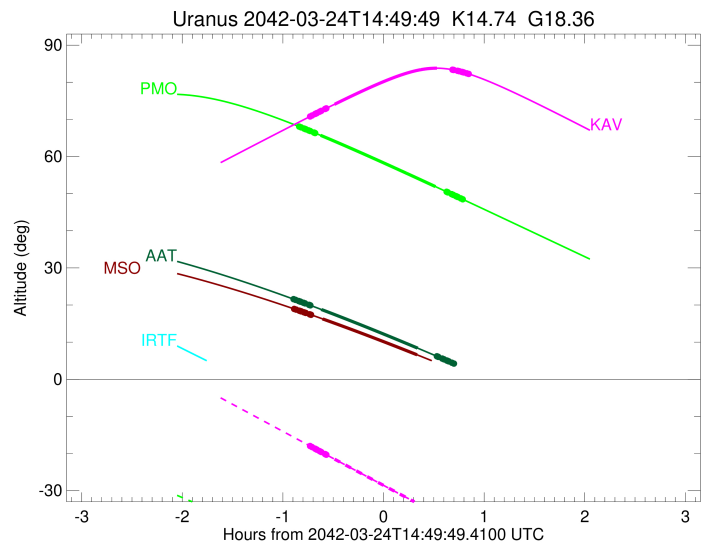
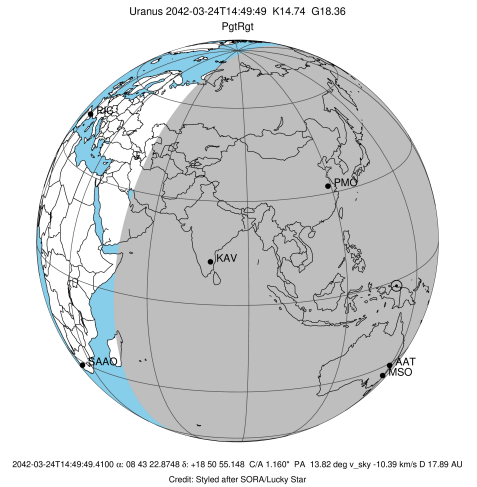


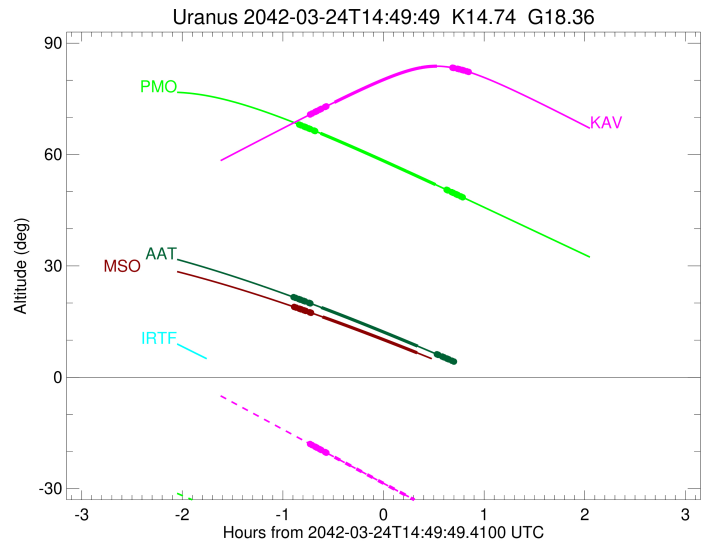
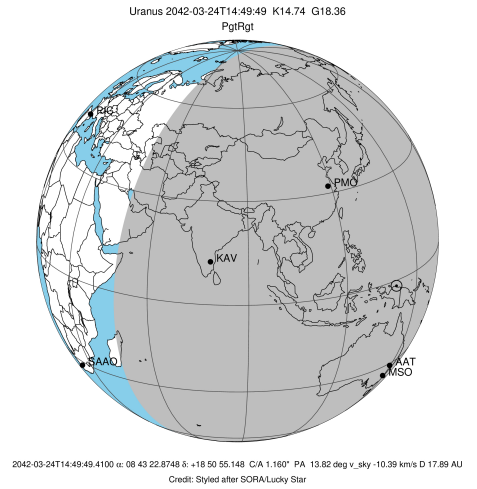


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2042-03-24T14:46:23.890  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PMO  
 Location : Purple Mtn Obs. Nanking  
 Latitude (deg) : 32.06667  
 E. Longitude (deg) : 118.82089  
 Altitude (km) : 0.364  
 Gaia source ID : 660961764247728000  
 2Mass ID (if available) : 08432288+1850553  
 ICRS Star Coord at Epoch: 08h 43m 22.87479s +18:50:55.14818s  
 RUWE (>1.4 is poor) : 1.07  
 K magnitude : 14.743  
 G magnitude : 18.361  
 RP magnitude : 17.135  
 BP magnitude : 19.141  
 DUPflag : 0  
 Distance (au) : 17.892  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -10.38  
 Sun-Target sep (deg) : 124.73  
 Sun-Moon sep (deg) : 85.06  
 B (ring opening deg) : 38.86  
 PA of pole (deg) : 94.60  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.981  
 C/A sky separation (km) : 12734.6  
 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



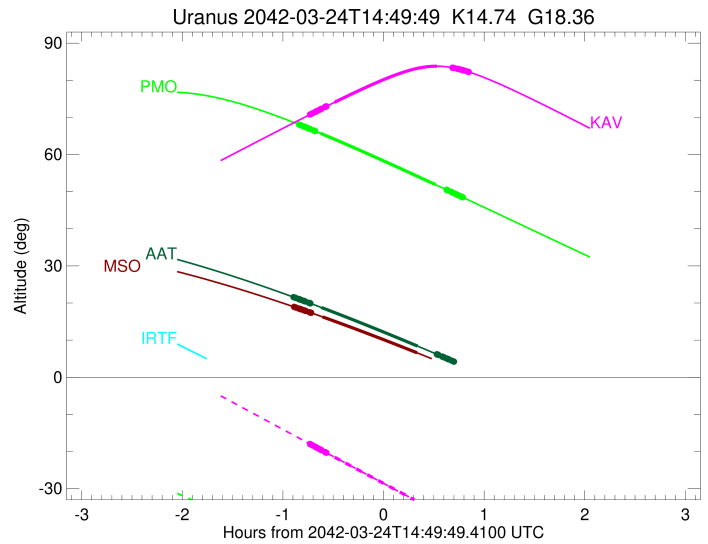
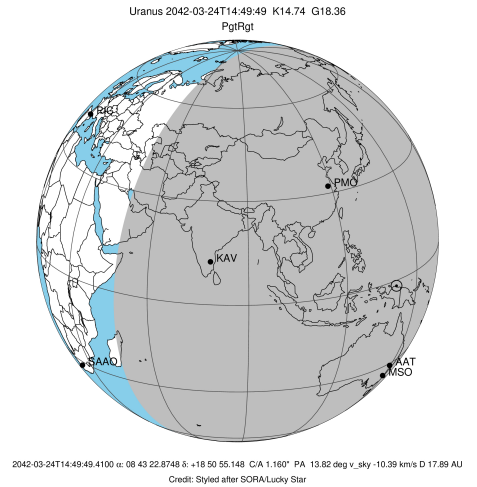
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2042-03-24T13:59:17.590		68.11	-44.25	51444.43	-16.45		
lambda	I	2042-03-24T14:00:43.750		67.86	-44.48	50026.71	-16.44		
delta	I	2042-03-24T14:02:28.920		67.54	-44.76	48300.35	-16.39		
gamma	I	2042-03-24T14:03:10.389		67.41	-44.87	47620.99	-16.37		
eta	I	2042-03-24T14:03:37.571		67.33	-44.94	47176.12	-16.36		
beta	I	2042-03-24T14:05:09.623		67.05	-45.18	45668.33	-16.31		
alpha	I	2042-03-24T14:06:08.087		66.87	-45.34	44705.45	-16.28		
4	I	2042-03-24T14:08:20.371		66.46	-45.68	42543.42	-16.19		
5	I	2042-03-24T14:08:44.804		66.38	-45.74	42198.70	-16.19		
6	I	2042-03-24T14:09:05.072		66.32	-45.79	41794.80	-16.15		
Uranus	I	2042-03-24T14:12:17.063		65.72	-46.28	25360.80		-46.36	-47.67
Uranus	E	2042-03-24T15:20:45.153		51.91	-54.43	25417.93		37.55	38.83
6	E	2042-03-24T15:27:29.868		50.50	-54.93	41870.48	16.01		
5	E	2042-03-24T15:27:47.204		50.44	-54.95	42223.22	16.05		
4	E	2042-03-24T15:28:12.706		50.35	-54.98	42573.52	16.04		
alpha	E	2042-03-24T15:30:27.536		49.87	-55.13	44746.56	16.12		
beta	E	2042-03-24T15:31:22.475		49.68	-55.19	45645.00	16.15		
eta	E	2042-03-24T15:32:57.048		49.35	-55.29	47176.12	16.19		
gamma	E	2042-03-24T15:33:25.135		49.25	-55.31	47631.08	16.20		
delta	E	2042-03-24T15:34:06.418		49.11	-55.36	48300.35	16.22		
lambda	E	2042-03-24T15:35:52.727		48.73	-55.46	50026.71	16.26		
epsilon	E	2042-03-24T15:36:37.540		48.57	-55.50	50755.59	16.26		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2042-03-24T14:51:03.630  
 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 : 660961764247728000  
 2Mass ID (if available) : 08432288+1850553  
 ICRS Star Coord at Epoch: 08h 43m 22.87479s +18:50:55.14818s  
 RUWE (>1.4 is poor) : 1.07  
 K magnitude : 14.743  
 G magnitude : 18.361  
 RP magnitude : 17.135  
 BP magnitude : 19.141  
 DUPflag : 0  
 Distance (au) : 17.892  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -10.38  
 Sun-Target sep (deg) : 124.73  
 Sun-Moon sep (deg) : 85.16  
 B (ring opening deg) : 38.86  
 PA of pole (deg) : 94.60  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.227  
 C/A sky separation (km) : 15918.9  
 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



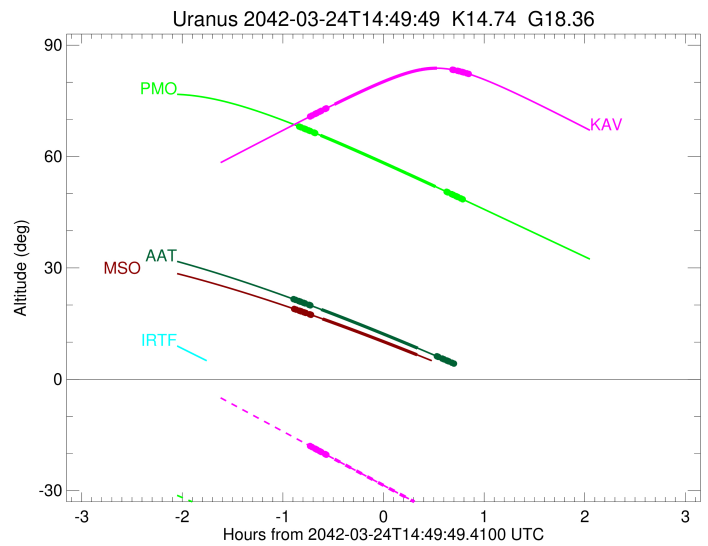
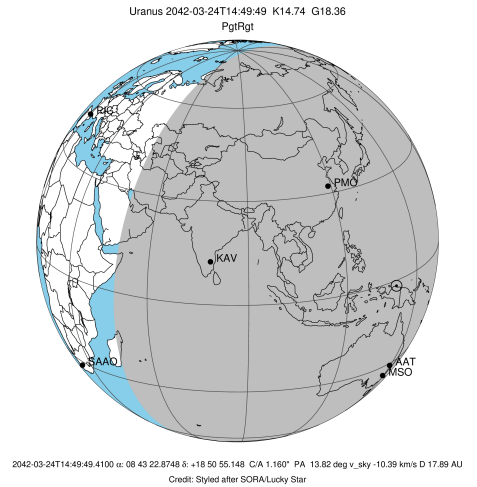
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2042-03-24T14:05:48.466		70.73	-17.92	51426.64	-16.23		
lambda	I	2042-03-24T14:07:14.695		71.06	-18.27	50026.71	-16.21		
delta	I	2042-03-24T14:09:01.413		71.47	-18.70	48300.35	-16.14		
gamma	I	2042-03-24T14:09:43.533		71.62	-18.87	47621.04	-16.11		
eta	I	2042-03-24T14:10:11.161		71.73	-18.98	47176.12	-16.09		
beta	I	2042-03-24T14:11:44.880		72.08	-19.36	45666.99	-16.02		
alpha	I	2042-03-24T14:12:44.250		72.31	-19.60	44707.74	-15.97		
4	I	2042-03-24T14:14:59.529		72.81	-20.15	42540.75	-15.84		
5	I	2042-03-24T14:15:24.437		72.91	-20.25	42193.27	-15.83		
6	I	2042-03-24T14:15:45.083		72.99	-20.33	41794.76	-15.79		
Uranus	I	2042-03-24T14:20:35.614		74.07	-21.51	25386.73		-42.39	-43.70
Uranus	E	2042-03-24T15:21:40.425		83.80	-36.23	25453.30		31.81	33.00
6	E	2042-03-24T15:30:58.688		83.38	-38.45	41868.12	15.77		
5	E	2042-03-24T15:31:16.306		83.36	-38.52	42216.62	15.82		
4	E	2042-03-24T15:31:42.182		83.32	-38.62	42569.76	15.82		
alpha	E	2042-03-24T15:33:59.027		83.10	-39.17	44747.97	15.96		
beta	E	2042-03-24T15:34:54.374		83.00	-39.38	45644.13	16.01		
eta	E	2042-03-24T15:36:29.782		82.81	-39.76	47176.12	16.08		
gamma	E	2042-03-24T15:36:58.050		82.75	-39.88	47630.90	16.10		
delta	E	2042-03-24T15:37:39.598		82.66	-40.04	48300.35	16.13		
lambda	E	2042-03-24T15:39:26.427		82.42	-40.46	50026.71	16.19		
epsilon	E	2042-03-24T15:40:11.047		82.32	-40.64	50749.81	16.21		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2042-03-24T14:41:19.300  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : AAT  
 Location : Siding Spring (AAT)  
 Latitude (deg) : -31.27703  
 E. Longitude (deg) : 149.06608  
 Altitude (km) : 1.164  
 Gaia source ID : 660961764247728000  
 2Mass ID (if available) : 08432288+1850553  
 ICRS Star Coord at Epoch: 08h 43m 22.87479s +18:50:55.14818s  
 RUWE (>1.4 is poor) : 1.07  
 K magnitude : 14.743  
 G magnitude : 18.361  
 RP magnitude : 17.135  
 BP magnitude : 19.141  
 DUPflag : 0  
 Distance (au) : 17.892  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -10.38  
 Sun-Target sep (deg) : 124.73  
 Sun-Moon sep (deg) : 84.48  
 B (ring opening deg) : 38.86  
 PA of pole (deg) : 94.60  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.371  
 C/A sky separation (km) : 17793.3  
 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	2042-03-24T13:55:57.059		21.62	-60.33	51413.38	-15.74		
lambda	I	2042-03-24T13:57:25.151		21.38	-60.36	50026.71	-15.71		
delta	I	2042-03-24T13:59:15.361		21.08	-60.40	48300.35	-15.62		
gamma	I	2042-03-24T13:59:58.903		20.96	-60.42	47621.09	-15.58		
eta	I	2042-03-24T14:00:27.484		20.88	-60.43	47176.12	-15.56		
beta	I	2042-03-24T14:02:04.580		20.61	-60.45	45666.04	-15.46		
alpha	I	2042-03-24T14:03:06.003		20.44	-60.47	44709.36	-15.40		
4	I	2042-03-24T14:05:26.720		20.04	-60.49	42539.03	-15.22		
5	I	2042-03-24T14:05:52.564		19.97	-60.50	42189.69	-15.21		
6	I	2042-03-24T14:06:14.027		19.91	-60.50	41794.88	-15.16		
Uranus	I	2042-03-24T14:12:44.711		18.80	-60.51	25408.65		-39.00	-40.30
Uranus	E	2042-03-24T15:10:11.003		8.39	-57.26	25474.13		28.16	29.27
6	E	2042-03-24T15:21:41.483		6.19	-55.99	41866.73	14.97		
5	E	2042-03-24T15:22:00.096		6.13	-55.95	42213.06	15.02		
4	E	2042-03-24T15:22:27.341		6.04	-55.90	42567.71	15.02		
alpha	E	2042-03-24T15:24:51.540		5.57	-55.61	44748.66	15.18		
beta	E	2042-03-24T15:25:49.634		5.39	-55.49	45643.70	15.24		
eta	E	2042-03-24T15:27:29.827		5.06	-55.28	47176.12	15.33		
gamma	E	2042-03-24T15:27:59.473		4.97x	-55.22	47630.79	15.35		
delta	E	2042-03-24T15:28:43.050		4.83x	-55.13	48300.35	15.38		
lambda	E	2042-03-24T15:30:34.999		4.46x	-54.89	50026.71	15.46		
epsilon	E	2042-03-24T15:31:21.579		4.31x	-54.79	50747.49	15.48		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2042-03-24T14:41:31.310  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : MSO  
 Location : Mt. Stromlo Observatory  
 Latitude (deg) : -35.32000  
 E. Longitude (deg) : 149.00833  
 Altitude (km) : 0.770  
 Gaia source ID : 660961764247728000  
 2Mass ID (if available) : 08432288+1850553  
 ICRS Star Coord at Epoch: 08h 43m 22.87479s +18:50:55.14818s  
 RUWE (>1.4 is poor) : 1.07  
 K magnitude : 14.743  
 G magnitude : 18.361  
 RP magnitude : 17.135  
 BP magnitude : 19.141  
 DUPflag : 0  
 Distance (au) : 17.892  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -10.38  
 Sun-Target sep (deg) : 124.73  
 Sun-Moon sep (deg) : 84.44  
 B (ring opening deg) : 38.86  
 PA of pole (deg) : 94.60  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.399  
 C/A sky separation (km) : 18151.3  
 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	2042-03-24T13:56:18.451		18.99	-56.32	51411.16	-15.68		
lambda	I	2042-03-24T13:57:46.753		18.76	-56.36	50026.71	-15.64		
delta	I	2042-03-24T13:59:37.426		18.47	-56.39	48300.35	-15.55		
gamma	I	2042-03-24T14:00:21.157		18.36	-56.40	47621.09	-15.51		
eta	I	2042-03-24T14:00:49.867		18.28	-56.41	47176.12	-15.49		
beta	I	2042-03-24T14:02:27.422		18.03	-56.43	45665.88	-15.39		
alpha	I	2042-03-24T14:03:29.121		17.86	-56.44	44709.64	-15.32		
4	I	2042-03-24T14:05:50.603		17.49	-56.47	42538.75	-15.14		
5	I	2042-03-24T14:06:16.575		17.42	-56.47	42189.09	-15.13		
6	I	2042-03-24T14:06:38.155		17.37	-56.47	41794.92	-15.08		
Uranus	I	2042-03-24T14:13:28.599		16.27	-56.47	25412.83		-38.35	-39.64
Uranus	E	2042-03-24T15:09:50.751		6.59	-53.73	25478.61		27.34	28.43
6	E	2042-03-24T15:21:48.284		4.41x	-52.58	41866.43	14.89		
5	E	2042-03-24T15:22:07.005		4.36x	-52.54	42212.30	14.94		
4	E	2042-03-24T15:22:34.379		4.27x	-52.50	42567.27	14.95		
alpha	E	2042-03-24T15:24:59.295		3.83x	-52.24	44748.81	15.12		
beta	E	2042-03-24T15:25:57.628		3.65x	-52.14	45643.61	15.18		
eta	E	2042-03-24T15:27:38.234		3.34x	-51.96	47176.12	15.27		
gamma	E	2042-03-24T15:28:07.993		3.25x	-51.90	47630.77	15.29		
delta	E	2042-03-24T15:28:51.735		3.11x	-51.82	48300.35	15.32		
lambda	E	2042-03-24T15:30:44.085		2.77x	-51.61	50026.71	15.41		
epsilon	E	2042-03-24T15:31:30.794		2.62x	-51.52	50747.05	15.43		