u102a_irtf_320cm_2200nm_predicted_ring_event_times.txt produced Mon Apr 5 10:37:42 2021 using
rfrench@Achilles.fios-router.home:/Volumes/PromisePegasus28TB_backup/dione_raid2/Research/uranus/PDART2014/programs/pro_occinfo2geom_plots_pds4_v7
.pro

Bundle ID: uranus_occ_u102a_irtf_320cm

```
Event:                                  u102a
Planet:                                 Uranus
Reference:                              R. G. French et al. Bulletin of the American Astronomical Society, Vol. 24, p.1029, 1992
Title:                                  Observations of the July 1992 Occultations of U102 and U103 by Uranus and of N4174 by Neptune
Computations from:                      1992-07-08T09:27:12.8000Z to 1992-07-08T11:15:22.5500Z
Observatory name:                       IRTF
Observatory code file directory:        /Volumes/dione_raid2/Research/kernels/
Observatory code file:                  ObsCodes_pck00010_20200709_Elon+ocobs_v9BJ.obs
Observatory code:                       568
Observatory abbreviation:               irtf
Entry from observatory code file:
    568 G +204 31 40.08  +19 49 34.0        4212 Mauna Kea                                          pck00010.tpc
Telescope:                              320cm
Instrument:                             Generic InSb High Speed Photometer
Mean wavelength (nm)                    2200nm
Observatory latitude (deg):              19.826111111
Observatory E longitude (deg):          204.527800000
Observatory altitude (km):                4.212000000
Ellipsoid source:                       /Volumes/dione_raid2/Research/kernels/pck00010.tpc
Observatory reference frame:            ITRF93
Earth equatorial radius (km):           6378.136600000
Earth 1/flattening:                      298.257006177
Topocentric position vector:           -5464.341062821   -2493.446346975    2151.026113131
Leapsecond kernel file:                 /Volumes/dione_raid2/Research/kernels/naif0012.tls
Star catalog directory:                 /Volumes/dione_raid2/Research/RINGFIT/stars/data/
Star catalog file:                      ustarsALLd.v3.merged.sortedA.csv
Star catalog ID:                        22794648
Star number:                            22
Star name:                              U102A
Star source catalog:                    UCAC2
Star RA (deg):                          287.525552700
Star Dec (deg):                         -22.897653900
Star epoch:                             2000-01-01T00:00:00.0000Z
Star parallax (mas):                      0.000000000
Star pm RA (mas/yr):                      1.800000000
Star pm Dec (mas/yr):                    -4.600000000
Star catalog positions in frame:        J2000
Star frame for calculations:            J2000
Heliocentric frame for calculations:    J2000
Ringfit savefile directory:             /Volumes/dione_raid2/Research/RINGFIT/tests/Uranus/Ur017L/savefiles/
Ringfit savefile for star/time offsets: ringfit_v1.8.Ur017L-RF-V0204.sav
Ringfit output file directory:          /Volumes/dione_raid2/Research/RINGFIT/tests/Uranus/Ur017L/outfiles/
Ringfit output file:                    ringfit_v1.8.Ur017L-RF-V0204.out
Star offsets dRA,dDec (mas):              3.820736388      33.893989435
Time offset for this obstr./event (sec):  0.000000000
Kernel directory:                       /Volumes/dione_raid2/Research/kernels/
   ../../../../kernels/ura111.bsp
   ../../../../kernels/vgr2.ura111.bsp
   ../../../../kernels/earthstns_itrf93_040916.bsp
   ../../../../kernels/earth_720101_031229.bpc
   ../../../../kernels/pg3f0000r.bsp
   ../../../../kernels/pg490000r.bsp
   ../../../../kernels/naif0012.tls
   /Volumes/dione_raid2/Research/RINGFIT/tests/Uranus/Ur017L/savefiles/../kernels/RAJobs_U111+rgf9.spk
   /Volumes/dione_raid2/Research/RINGFIT/tests/Uranus/Ur017L/savefiles/../kernels/URKALLv1.spk
   /Volumes/dione_raid2/Research/kernels/uranus_ringframes_rfrench20201201_v1.tf
   /Volumes/dione_raid2/Research/kernels/pck00010.tpc
```

Predicted Ring/Atmosphere Occultation Events

Ring	I/E	UTC(Earth)	UTC(@ring)	R(model)	R-dot	Anomaly	Sin B	Ulon	Alt(deg)	Sun(deg)
epsilon	I	1992-07-08T09:41:27.76Z	1992-07-08T07:07:23.57Z	51143.61	-25.699	89.631	-0.87014	16.463	45.954	-46.315
lambda	I	1992-07-08T09:42:11.27Z	1992-07-08T07:08:07.07Z	50026.01	-25.676	287.656	-0.87014	16.719	45.996	-46.360
delta	I	1992-07-08T09:43:18.52Z	1992-07-08T07:09:14.33Z	48300.24	-25.637	44.614	-0.87014	17.139	46.061	-46.428
gamma	I	1992-07-08T09:43:44.64Z	1992-07-08T07:09:40.44Z	47631.04	-25.620	148.706	-0.87014	17.310	46.086	-46.454
eta	I	1992-07-08T09:44:02.41Z	1992-07-08T07:09:58.21Z	47176.07	-25.609	348.939	-0.87013	17.429	46.102	-46.471
beta	I	1992-07-08T09:45:01.95Z	1992-07-08T07:10:57.75Z	45650.19	-25.566	303.285	-0.87018	17.846	46.157	-46.529
alpha	I	1992-07-08T09:45:39.09Z	1992-07-08T07:11:34.89Z	44696.96	-25.535	50.323	-0.87026	18.120	46.191	-46.565
four	I	1992-07-08T09:47:02.55Z	1992-07-08T07:12:58.34Z	42584.58	-25.473	107.107	-0.86993	18.782	46.264	-46.642
five	I	1992-07-08T09:47:18.06Z	1992-07-08T07:13:13.86Z	42156.68	-25.441	12.370	-0.87061	18.912	46.278	-46.656
six	I	1992-07-08T09:47:29.37Z	1992-07-08T07:13:25.17Z	41875.62	-25.431	154.210	-0.87047	19.008	46.287	-46.667
Atmosphere	I	1992-07-08T09:55:19.17Z							46.649	-47.051
Atmosphere	E	1992-07-08T10:30:22.27Z							47.244	-47.747
six	E	1992-07-08T10:39:07.96Z	1992-07-08T08:05:03.62Z	41812.01	25.434	306.451	-0.87047	171.357	47.125	-47.652
five	E	1992-07-08T10:39:27.47Z	1992-07-08T08:05:23.13Z	42312.58	25.453	164.882	-0.87061	171.526	47.119	-47.646
four	E	1992-07-08T10:39:37.13Z	1992-07-08T08:05:32.79Z	42579.24	25.479	259.853	-0.86993	171.622	47.116	-47.644
alpha	E	1992-07-08T10:41:02.60Z	1992-07-08T08:06:58.25Z	44749.60	25.543	204.409	-0.87026	172.291	47.085	-47.617
beta	E	1992-07-08T10:41:38.20Z	1992-07-08T08:07:33.86Z	45664.01	25.572	97.915	-0.87018	172.557	47.072	-47.605
eta	E	1992-07-08T10:42:37.23Z	1992-07-08T08:08:32.88Z	47176.36	25.615	144.412	-0.87013	172.971	47.048	-47.584
gamma	E	1992-07-08T10:42:54.69Z	1992-07-08T08:08:50.34Z	47623.48	25.626	304.407	-0.87014	173.088	47.041	-47.578
delta	E	1992-07-08T10:43:21.11Z	1992-07-08T08:09:16.76Z	48300.72	25.642	200.665	-0.87014	173.261	47.030	-47.568
lambda	E	1992-07-08T10:44:28.34Z	1992-07-08T08:10:23.98Z	50026.01	25.681	84.548	-0.87014	173.681	47.001	-47.541
epsilon	E	1992-07-08T10:45:18.11Z	1992-07-08T08:11:13.75Z	51304.79	25.708	247.085	-0.87014	173.973	46.978	-47.520

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Event geometry at 1992-07-08T10:12:50.0000Z
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    Ring opening angle B (deg):  -60.47479
Position angle of pole P (deg):  279.74460
 Observer-planet distance (km):    2771.366935 x 10^6
       Light travel time (sec):    9244.285041
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