u2_teide_155cm_880nm_predicted_ring_event_times.txt produced Sun Apr 4 13:49:57 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_u2_teide_155cm

```
Event:                                  u2
Planet:                                 Uranus
Reference:                              Millis et al. (1978) Astron J. 83, 993-998
Title:                                  The occultation of BD -15 3968 by the rings of Uranus
Computations from:                      1977-12-23T06:57:54.6300Z to 1977-12-23T06:59:51.9550Z
Observatory name:                       Observatorio del Teide
Observatory code file directory:        /Volumes/dione_raid2/Research/kernels/
Observatory code file:                  ObsCodes_pck00010_20200709_Elon+ocobs_v9BJ.obs
Observatory code:                       TEN
Observatory abbreviation:               teide
Entry from observatory code file:
    TEN G -016 29 45.00  +28 17 32.0        2380 Tenerife Cabezon Observatory 1.55m Carlos Sanches   pck00010.tpc
Telescope:                              155cm
Instrument:                             Generic Visual HSP photometer
Mean wavelength (nm)                    880nm
Observatory latitude (deg):                28.292222222
Observatory E longitude (deg):            -16.495833333
Observatory altitude (km):                 2.380000000
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:               5391.117218988   -1596.495229570    3006.188127254
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:                        148-144064
Star number:                               80
Star name:                              U2
Star source catalog:                    UCAC3
Star RA (deg):                            222.880566500
Star Dec (deg):                           -16.035057000
Star epoch:                             2000-01-01T00:00:00.0000Z
Star parallax (mas):                       0.000000000
Star pm RA (mas/yr):                      -14.700000000
Star pm Dec (mas/yr):                      2.300000000
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):              -71.480009304      70.633182254
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	1977-12-23T06:57:59.96Z	1977-12-23T04:17:43.92Z	51065.55	-31.038	281.488	-0.83738	167.859	29.365	-12.315
lambda	I	1977-12-23T06:58:33.49Z	1977-12-23T04:18:17.45Z	50026.01	-30.971	345.047	-0.83738	167.481	29.458	-12.200
delta	I	1977-12-23T06:59:29.32Z	1977-12-23T04:19:13.28Z	48300.40	-30.850	279.832	-0.83738	166.816	29.612	-12.008
gamma	I	1977-12-23T06:59:51.12Z	1977-12-23T04:19:35.08Z	47628.26	-30.799	250.546	-0.83738	166.543	29.671	-11.933

```
Event geometry at 1977-12-23T06:59:52.0000Z
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    Ring opening angle B (deg):  -56.86490
Position angle of pole P (deg):   93.31888
 Observer-planet distance (km):    2882.841762 x 10^6
       Light travel time (sec):    9616.125038
```