u36_maunakea_380cm_2200nm_predicted_ring_event_times.txt produced Mon Apr 5 08:30:13 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_u36_maunakea_380cm

```
Event:                                  u36
Planet:                                 Uranus
Reference:                              J. L. Elliot and 13 colleagues. BAAS 19, 884 (1987)
Title:                                  A four-day occultation by Uranus and its rings
Computations from:                      1987-03-30T12:27:07.8210Z to 1987-04-02T16:02:47.1400Z
Observatory name:                       United Kingdom Infrared Telescope
Observatory code file directory:        /Volumes/dione_raid2/Research/kernels/
Observatory code file:                  ObsCodes_pck00010_20200709_Elon+ocobs_v9BJ.obs
Observatory code:                       UKI
Observatory abbreviation:               maunakea
Entry from observatory code file:
    UKI G +204 31 26.40  +19 49 43.2        4194 UKIRT updated using ukirt_oldhawii2newsystem.pro
Telescope:                              380cm
Instrument:                             Generic InSb High Speed Photometer
Mean wavelength (nm)                    2200nm
Observatory latitude (deg):              19.828666667
Observatory E longitude (deg):          204.524000000
Observatory altitude (km):                4.194000000
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:           -5464.403657783   -2493.037048125    2151.286318566
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:                        333-124092
Star number:                              114
Star name:                              U36
Star source catalog:                    UCAC4
Star RA (deg):                          266.624681200
Star Dec (deg):                         -23.538897000
Star epoch:                             2000-01-01T00:00:00.0000Z
Star parallax (mas):                      0.000000000
Star pm RA (mas/yr):                     -3.200000000
Star pm Dec (mas/yr):                    -8.100000000
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):             17.783060768      75.423918081
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)
delta	I	1987-03-30T13:19:11.46Z	1987-03-30T10:41:31.73Z	48300.35	-0.473	290.155	-0.97769	206.487	34.995	-41.526
gamma	I	1987-03-30T13:43:48.36Z	1987-03-30T11:06:08.77Z	47628.84	-0.435	116.242	-0.97769	206.308	38.476	-36.165
eta	I	1987-03-30T14:01:38.15Z	1987-03-30T11:23:58.66Z	47176.17	-0.410	66.641	-0.97769	206.178	40.692	-32.202
beta	I	1987-03-30T15:10:00.78Z	1987-03-30T12:32:21.69Z	45659.21	-0.334	84.211	-0.97770	205.722	46.111	-16.597
alpha	I	1987-03-30T15:58:32.73Z	1987-03-30T13:20:53.92Z	44739.78	-0.301	128.462	-0.97764	205.484	46.335	-5.292
eta	E	1987-04-02T12:30:28.25Z	1987-04-02T09:53:12.81Z	47176.08	1.060	11.556	-0.97769	156.405	29.030	-50.639
gamma	E	1987-04-02T12:37:28.83Z	1987-04-02T10:00:13.43Z	47623.93	1.070	61.297	-0.97769	156.534	30.221	-49.282
delta	E	1987-04-02T12:47:57.60Z	1987-04-02T10:10:42.26Z	48300.61	1.084	235.321	-0.97769	156.731	31.953	-47.204
lambda	E	1987-04-02T13:14:08.48Z	1987-04-02T10:36:53.28Z	50026.01	1.114	23.241	-0.97769	157.242	35.993	-41.804
epsilon	E	1987-04-02T13:25:27.59Z	1987-04-02T10:48:12.46Z	50786.10	1.125	333.356	-0.97769	157.470	37.594	-39.396

```
Event geometry at 1987-04-01T03:06:10.0000Z
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    Ring opening angle B (deg):  -77.87531
Position angle of pole P (deg):  311.95670
 Observer-planet distance (km):    2828.310233 x 10^6
       Light travel time (sec):    9434.227437
```