u17b_saao_188cm_2220nm_predicted_ring_event_times.txt produced Sun Apr 4 23:53:07 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_u17b_saao_188cm

```
Event:                                  u17b
Planet:                                 Uranus
Reference:                              Elliot et al. Icarus 71, 91-102 (1987)
Title:                                  The Occultation of KME 17 by Uranus and its Rings
Computations from:                      1983-03-24T22:55:59.0000Z to 1983-03-25T04:55:42.4000Z
Observatory name:                       South African Astronomical Observatory
Observatory code file directory:        /Volumes/dione_raid2/Research/kernels/
Observatory code file:                  ObsCodes_pck00010_20200709_Elon+ocobs_v9BJ.obs
Observatory code:                       SAA
Observatory abbreviation:               saao
Entry from observatory code file:
    SAA G +020 48 38.52  -32 22 46.3        1768 SAAO SUTHERLAND 74"                                ocobs_v9BJ.tx
Telescope:                              188cm
Instrument:                             Generic InSb High Speed Photometer
Mean wavelength (nm)                    2220nm
Observatory latitude (deg):                 -32.379527778
Observatory E longitude (deg):               20.810700000
Observatory altitude (km):                    1.768000000
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:               5041.279432685    1916.079799298   -3396.994745721
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:                        80841
Star number:                               75
Star name:                              U17
Star source catalog:                    Hipparcos
Star RA (deg):                              247.630359900
Star Dec (deg):                             -21.741990010
Star epoch:                             1991-04-02T13:30:00.0000Z
Star parallax (mas):                          5.120000000
Star pm RA (mas/yr):                         -3.360000000
Star pm Dec (mas/yr):                         5.480000000
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):                -35.888294013       4.293142371
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	1983-03-25T00:26:01.18Z	1983-03-24T21:52:11.72Z	50897.35	-4.814	51.962	-0.98067	32.701	54.592	-50.772
lambda	I	1983-03-25T00:29:02.59Z	1983-03-24T21:55:13.15Z	50026.01	-4.791	264.808	-0.98067	33.267	55.226	-50.330
delta	I	1983-03-25T00:35:04.56Z	1983-03-24T22:01:15.15Z	48300.53	-4.741	106.883	-0.98067	34.458	56.488	-49.427
gamma	I	1983-03-25T00:37:28.17Z	1983-03-24T22:03:38.78Z	47621.17	-4.719	356.368	-0.98067	34.955	56.987	-49.061
eta	I	1983-03-25T00:39:02.62Z	1983-03-24T22:05:13.23Z	47176.09	-4.704	31.309	-0.98067	35.289	57.315	-48.817
beta	I	1983-03-25T00:44:30.73Z	1983-03-24T22:10:41.38Z	45641.66	-4.648	13.497	-0.98067	36.502	58.453	-47.958
alpha	I	1983-03-25T00:47:51.88Z	1983-03-24T22:14:02.54Z	44709.56	-4.610	285.514	-0.98069	37.291	59.148	-47.421
four	I	1983-03-25T00:55:46.44Z	1983-03-24T22:21:57.15Z	42546.34	-4.511	303.392	-0.98064	39.270	60.781	-46.124
five	I	1983-03-25T00:56:52.99Z	1983-03-24T22:23:03.70Z	42247.08	-4.495	98.712	-0.98074	39.563	61.009	-45.939
six	I	1983-03-25T00:58:14.70Z	1983-03-24T22:24:25.42Z	41879.50	-4.475	187.481	-0.98046	39.938	61.288	-45.711
Atmosphere	I	1983-03-25T02:12:56.12Z							75.308	-31.931
Atmosphere	E	1983-03-25T03:06:54.27Z							79.152	-20.997
six	E	1983-03-25T04:17:36.77Z	1983-03-25T01:43:48.59Z	41819.31	4.556	294.993	-0.98046	147.843	69.363	-6.212
five	E	1983-03-25T04:19:25.88Z	1983-03-25T01:45:37.71Z	42306.52	4.583	207.105	-0.98074	148.347	69.017	-5.828
four	E	1983-03-25T04:20:16.68Z	1983-03-25T01:46:28.51Z	42543.58	4.597	52.331	-0.98064	148.577	68.855	-5.650
alpha	E	1983-03-25T04:27:59.17Z	1983-03-25T01:54:11.04Z	44692.06	4.704	38.450	-0.98069	150.561	67.362	-4.024
beta	E	1983-03-25T04:31:26.58Z	1983-03-25T01:57:38.47Z	45673.66	4.748	128.054	-0.98067	151.389	66.683	-3.294
eta	E	1983-03-25T04:36:40.99Z	1983-03-25T02:02:52.92Z	47176.37	4.809	148.295	-0.98067	152.581	65.645	-2.188
gamma	E	1983-03-25T04:38:14.88Z	1983-03-25T02:04:26.81Z	47628.66	4.826	114.042	-0.98067	152.922	65.333	-1.858
delta	E	1983-03-25T04:40:33.80Z	1983-03-25T02:06:45.75Z	48300.65	4.850	225.541	-0.98067	153.415	64.869	-1.370
lambda	E	1983-03-25T04:46:27.44Z	1983-03-25T02:12:39.42Z	50026.01	4.907	25.886	-0.98067	154.611	63.682	-0.126
epsilon	E	1983-03-25T04:51:37.32Z	1983-03-25T02:17:49.32Z	51553.48	4.952	174.604	-0.98067	155.594	62.633	0.963

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Event geometry at 1983-03-25T02:39:56.0000Z
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    Ring opening angle B (deg):  -78.71537
Position angle of pole P (deg):   56.03599
 Observer-planet distance (km):    2766.486534 x 10^6
       Light travel time (sec):    9228.005777
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