u144_saao_188cm_2220nm_predicted_ring_event_times.txt produced Mon Apr 5 19:00:22 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_u144_saao_188cm

```
Event:                                  u144
Planet:                                 Uranus
Reference:                              Unpublished
Title:                                  Unpublished
Computations from:                      1997-09-30T20:48:30.0000Z to 1997-09-30T22:11:50.0000Z
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:                        24243741
Star number:                               60
Star name:                              U144
Star source catalog:                    UCAC2
Star RA (deg):                              307.350520900
Star Dec (deg):                             -19.670615600
Star epoch:                             2000-01-01T00:00:00.0000Z
Star parallax (mas):                          0.000000000
Star pm RA (mas/yr):                         -4.200000000
Star pm Dec (mas/yr):                        -0.400000000
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):                10.650601081      -9.675893390
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	1997-09-30T21:31:30.56Z	1997-09-30T18:50:31.33Z	50820.58	-7.703	36.142	-0.67180	47.473	47.085	-52.217
lambda	I	1997-09-30T21:33:14.28Z	1997-09-30T18:52:15.03Z	50026.01	-7.615	23.804	-0.67180	48.232	46.720	-52.356
delta	I	1997-09-30T21:37:03.95Z	1997-09-30T18:56:04.68Z	48300.26	-7.405	49.268	-0.67180	49.998	45.913	-52.650
gamma	I	1997-09-30T21:38:35.73Z	1997-09-30T18:57:36.44Z	47624.86	-7.315	72.240	-0.67180	50.738	45.590	-52.762
eta	I	1997-09-30T21:39:37.26Z	1997-09-30T18:58:37.97Z	47176.38	-7.253	163.366	-0.67181	51.247	45.374	-52.835
beta	I	1997-09-30T21:43:10.73Z	1997-09-30T19:02:11.41Z	45650.73	-7.024	58.540	-0.67179	53.086	44.622	-53.078
alpha	I	1997-09-30T21:45:22.30Z	1997-09-30T19:04:22.97Z	44739.94	-6.874	231.196	-0.67164	54.277	44.159	-53.219
four	I	1997-09-30T21:50:42.00Z	1997-09-30T19:09:42.64Z	42604.77	-6.458	222.339	-0.67209	57.386	43.033	-53.533
five	I	1997-09-30T21:51:51.32Z	1997-09-30T19:10:51.94Z	42156.72	-6.359	347.498	-0.67236	58.105	42.788	-53.596
six	I	1997-09-30T21:52:43.43Z	1997-09-30T19:11:44.05Z	41806.10	-6.287	317.162	-0.67180	58.680	42.605	-53.642

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Event geometry at 1997-09-30T22:11:50.0000Z
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    Ring opening angle B (deg):  -42.20604
Position angle of pole P (deg):  267.07565
 Observer-planet distance (km):    2895.862103 x 10^6
       Light travel time (sec):    9659.556222
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