u134_saao_188cm_2220nm_predicted_ring_event_times.txt produced Mon Apr 5 14:11:56 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_u134_saao_188cm

```
Event:                                  u134
Planet:                                 Uranus
Reference:                              Unpublished
Title:                                  Unpublished
Computations from:                      1995-09-09T17:06:42.0000Z to 1995-09-09T19:50:00.1581Z
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:                        23509999
Star number:                               47
Star name:                              U134
Star source catalog:                    UCAC2
Star RA (deg):                              299.026951200
Star Dec (deg):                             -21.338000600
Star epoch:                             2000-01-01T00:00:00.0000Z
Star parallax (mas):                          0.000000000
Star pm RA (mas/yr):                         11.300000000
Star pm Dec (mas/yr):                        -5.200000000
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):               -13.584603129     -28.480561241
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	1995-09-09T18:04:16.62Z	1995-09-09T15:25:43.62Z	50822.04	-14.821	323.519	-0.76628	29.481	70.000	-21.819
lambda	I	1995-09-09T18:05:10.40Z	1995-09-09T15:26:37.39Z	50026.01	-14.778	33.829	-0.76628	29.876	70.166	-22.006
delta	I	1995-09-09T18:07:07.58Z	1995-09-09T15:28:34.56Z	48300.60	-14.673	236.718	-0.76628	30.782	70.525	-22.414
gamma	I	1995-09-09T18:07:53.71Z	1995-09-09T15:29:20.69Z	47624.54	-14.628	291.488	-0.76628	31.157	70.666	-22.575
eta	I	1995-09-09T18:08:24.38Z	1995-09-09T15:29:51.35Z	47176.16	-14.599	65.463	-0.76628	31.412	70.759	-22.681
beta	I	1995-09-09T18:10:07.93Z	1995-09-09T15:31:34.89Z	45672.88	-14.490	125.280	-0.76623	32.310	71.072	-23.041
alpha	I	1995-09-09T18:11:14.64Z	1995-09-09T15:32:41.59Z	44698.50	-14.409	53.618	-0.76644	32.924	71.273	-23.273
four	I	1995-09-09T18:13:46.72Z	1995-09-09T15:35:13.65Z	42526.29	-14.220	353.418	-0.76620	34.417	71.726	-23.802
five	I	1995-09-09T18:14:03.64Z	1995-09-09T15:35:30.57Z	42314.83	-14.207	173.421	-0.76568	34.579	71.776	-23.860
six	I	1995-09-09T18:14:30.51Z	1995-09-09T15:35:57.44Z	41873.86	-14.141	210.780	-0.76696	34.891	71.855	-23.954
Atmosphere	I	1995-09-09T18:27:31.10Z							74.053	-26.649
Atmosphere	E	1995-09-09T19:12:49.65Z							78.879	-35.886
six	E	1995-09-09T19:30:12.82Z	1995-09-09T16:51:39.24Z	41799.34	14.129	333.191	-0.76696	157.437	78.696	-39.317
five	E	1995-09-09T19:30:37.66Z	1995-09-09T16:52:04.08Z	42199.24	14.190	296.433	-0.76568	157.750	78.675	-39.398
four	E	1995-09-09T19:31:06.23Z	1995-09-09T16:52:32.65Z	42591.75	14.221	116.894	-0.76620	158.033	78.651	-39.490
alpha	E	1995-09-09T19:33:38.58Z	1995-09-09T16:55:04.98Z	44752.64	14.406	180.086	-0.76644	159.506	78.504	-39.985
beta	E	1995-09-09T19:34:41.22Z	1995-09-09T16:56:07.62Z	45667.15	14.482	252.949	-0.76623	160.087	78.437	-40.187
eta	E	1995-09-09T19:36:25.21Z	1995-09-09T16:57:51.60Z	47176.38	14.590	194.938	-0.76628	160.986	78.315	-40.523
gamma	E	1995-09-09T19:36:55.84Z	1995-09-09T16:58:22.22Z	47623.94	14.619	61.455	-0.76628	161.241	78.277	-40.622
delta	E	1995-09-09T19:37:42.02Z	1995-09-09T16:59:08.40Z	48300.16	14.664	7.449	-0.76628	161.615	78.218	-40.771
lambda	E	1995-09-09T19:39:39.31Z	1995-09-09T17:01:05.68Z	50026.01	14.767	166.388	-0.76628	162.522	78.058	-41.148
epsilon	E	1995-09-09T19:40:58.37Z	1995-09-09T17:02:24.73Z	51196.02	14.831	97.044	-0.76628	163.098	77.942	-41.401

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Event geometry at 1995-09-09T18:50:10.0000Z
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    Ring opening angle B (deg):  -50.02121
Position angle of pole P (deg):  271.63791
 Observer-planet distance (km):    2852.103406 x 10^6
       Light travel time (sec):    9513.592921
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