

u25_mcdonald_270cm_2200nm_predicted_ring_event_times.txt produced Mon Apr 5 01:00:36 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_u25_mcdonald_270cm

```
Event: u25
Planet: Uranus
Reference: French et al. 1988 Icarus 73, 349-378
Title: Uranian ring orbits from earth-based and Voyager occultation observations.
Computations from: 1985-05-24T07:48:00.0000Z to 1985-05-24T08:53:00.0000Z
Observatory name: McDonald Observatory
Observatory code file directory: /Volumes/dione_raid2/Research/kernels/
Observatory code file: ObsCodes_pck00010_20200709_Elon+ocobs_v9BJ.obs
Observatory code: 711
Observatory abbreviation: mcdonald
Entry from observatory code file:
  711 G +255 58 42.60 +30 40 17.3          2103 McDonald Observatory, Fort Davis          pck00010.tpc
Telescope: 270cm
Instrument: Generic InSb High Speed Photometer
Mean wavelength (nm): 2200nm
Observatory latitude (deg): 30.671472222
Observatory E longitude (deg): 255.978500000
Observatory altitude (km): 2.103000000
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: -1330.748254058 -5328.820339318 3235.692051442
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: 22734194
Star number: 87
Star name: U25
Star source catalog: UCAC2
Star RA (deg): 255.590005300
Star Dec (deg): -22.807145900
Star epoch: 2000-01-01T00:00:00.0000Z
Star parallax (mas): 0.000000000
Star pm RA (mas/yr): 5.500000000
Star pm Dec (mas/yr): -23.500000000
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): 64.047842329 -291.804001671
Time offset for this obstr./event (sec): 0.000000000
Kernel directory: /Volumes/dione_raid2/Research/kernels/
  ../../../../kernels/urall1.bsp
  ../../../../kernels/vgr2.urall1.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	1985-05-24T07:49:12.36Z	1985-05-24T05:18:44.56Z	50749.86	-18.020	349.860	-0.99073	329.377	36.541 -36.801
lambda	I	1985-05-24T07:49:52.68Z	1985-05-24T05:19:24.87Z	50026.01	-17.887	114.213	-0.99073	328.787	36.541 -36.760
delta	I	1985-05-24T07:51:30.06Z	1985-05-24T05:21:02.25Z	48300.62	-17.540	126.033	-0.99073	327.290	36.540 -36.658
gamma	I	1985-05-24T07:52:08.93Z	1985-05-24T05:21:41.13Z	47621.46	-17.391	340.565	-0.99073	326.661	36.539 -36.617
eta	I	1985-05-24T07:52:34.61Z	1985-05-24T05:22:06.81Z	47176.09	-17.292	329.405	-0.99073	326.237	36.538 -36.589
beta	I	1985-05-24T07:54:02.33Z	1985-05-24T05:23:34.53Z	45675.41	-16.921	134.658	-0.99072	324.723	36.533 -36.494
alpha	I	1985-05-24T07:54:59.78Z	1985-05-24T05:24:31.98Z	44711.26	-16.657	282.544	-0.99070	323.677	36.528 -36.430
four	I	1985-05-24T07:57:13.01Z	1985-05-24T05:26:45.22Z	42532.27	-15.981	329.446	-0.99078	321.075	36.514 -36.279
five	I	1985-05-24T07:57:33.64Z	1985-05-24T05:27:05.85Z	42202.02	-15.865	65.758	-0.99085	320.650	36.511 -36.255
six	I	1985-05-24T07:57:57.65Z	1985-05-24T05:27:29.86Z	41831.46	-15.727	82.125	-0.99060	320.135	36.508 -36.227
six	E	1985-05-24T08:42:49.59Z	1985-05-24T06:12:21.86Z	41795.26	15.717	351.334	-0.99060	229.422	35.058 -32.165
five	E	1985-05-24T08:43:13.00Z	1985-05-24T06:12:45.28Z	42162.94	15.853	333.953	-0.99085	228.925	35.037 -32.122
four	E	1985-05-24T08:43:40.14Z	1985-05-24T06:13:12.41Z	42596.17	16.004	236.644	-0.99078	228.365	35.011 -32.072
alpha	E	1985-05-24T08:45:52.07Z	1985-05-24T06:15:24.35Z	44752.53	16.670	184.588	-0.99070	225.792	34.885 -31.827
beta	E	1985-05-24T08:46:45.23Z	1985-05-24T06:16:17.50Z	45644.68	16.912	34.688	-0.99072	224.825	34.833 -31.728
eta	E	1985-05-24T08:48:14.79Z	1985-05-24T06:17:47.07Z	47176.34	17.291	226.370	-0.99073	223.279	34.743 -31.558
gamma	E	1985-05-24T08:48:40.92Z	1985-05-24T06:18:13.20Z	47629.41	17.392	236.692	-0.99073	222.846	34.716 -31.509
delta	E	1985-05-24T08:49:19.32Z	1985-05-24T06:18:51.60Z	48300.18	17.541	20.899	-0.99073	222.226	34.677 -31.436
lambda	E	1985-05-24T08:50:56.75Z	1985-05-24T06:20:29.03Z	50026.01	17.887	6.086	-0.99073	220.728	34.575 -31.248
epsilon	E	1985-05-24T08:52:10.25Z	1985-05-24T06:21:42.54Z	51349.40	18.123	240.082	-0.99073	219.665	34.497 -31.106

Event geometry at 1985-05-24T08:20:22.0000Z

```
Ring opening angle B (deg): -82.19387
Position angle of pole P (deg): 12.32333
Observer-planet distance (km): 2706.437781 x 10^6
Light travel time (sec): 9027.704698
```