

u23\_ctio\_400cm\_2200nm\_predicted\_ring\_event\_times.txt produced Mon Apr 5 00:02:51 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\_u23\_ctio\_400cm

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Event: u23
Planet: Uranus
Reference: French et al. 1988 Icarus 73, 349-378
Title: Uranian ring orbits from earth-based and Voyager occultation observations.
Computations from: 1985-05-04T02:50:59.8580Z to 1985-05-04T07:29:47.8580Z
Observatory name: Cerro Tololo Inter-American Observatory
Observatory code file directory: /Volumes/dione_raid2/Research/kernels/
Observatory code file: ObsCodes_pck00010_20200709_Elon+ocobs_v9BJ.obs
Observatory code: 807
Observatory abbreviation: ctio
Entry from observatory code file:
  807 G +289 11 38.80 -30 10 08.9          2380 CTIO 4m - tweaked 2020 Apr 01 to match JPL Horizons pck00010.tpc
Telescope: 400cm
Instrument: Generic InSb High Speed Photometer
Mean wavelength (nm): 2200nm
Observatory latitude (deg): -30.169138889
Observatory E longitude (deg): 289.194111111
Observatory altitude (km): 2.380000000
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: 1815.108950819 -5214.008358653 -3187.793456948
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: 22735323
Star number: 83
Star name: U23
Star source catalog: UCAC2
Star RA (deg): 256.378486200
Star Dec (deg): -22.873890300
Star epoch: 2000-01-01T00:00:00.0000Z
Star parallax (mas): 0.000000000
Star pm RA (mas/yr): -2.500000000
Star pm Dec (mas/yr): -11.700000000
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): 97.893847636 33.583458821
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

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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	1985-05-04T04:55:59.25Z	1985-05-04T02:24:24.29Z	50750.72	-13.370	10.776	-0.99086	322.900 61.463	-75.318
lambda	I	1985-05-04T04:56:53.73Z	1985-05-04T02:25:18.77Z	50026.01	-13.219	137.218	-0.99086	322.162 61.658	-75.265
delta	I	1985-05-04T04:59:06.17Z	1985-05-04T02:27:31.21Z	48300.70	-12.823	153.447	-0.99086	320.276 62.132	-75.125
gamma	I	1985-05-04T04:59:59.52Z	1985-05-04T02:28:24.56Z	47621.22	-12.649	8.669	-0.99086	319.478 62.323	-75.064
eta	I	1985-05-04T05:00:34.88Z	1985-05-04T02:28:59.92Z	47176.07	-12.524	358.511	-0.99086	318.936 62.449	-75.022
beta	I	1985-05-04T05:02:36.31Z	1985-05-04T02:31:01.37Z	45680.94	-12.090	167.788	-0.99085	316.996 62.883	-74.870
alpha	I	1985-05-04T05:03:59.16Z	1985-05-04T02:32:24.22Z	44693.24	-11.762	318.422	-0.99084	315.598 63.179	-74.759
four	I	1985-05-04T05:07:09.58Z	1985-05-04T02:35:34.65Z	42527.12	-10.929	12.753	-0.99084	312.148 63.858	-74.483
five	I	1985-05-04T05:07:33.65Z	1985-05-04T02:35:58.72Z	42263.15	-10.818	110.534	-0.99088	311.689 63.944	-74.446
six	I	1985-05-04T05:08:11.46Z	1985-05-04T02:36:36.53Z	41863.79	-10.642	128.515	-0.99084	310.947 64.079	-74.387
six	E	1985-05-04T05:54:30.39Z	1985-05-04T03:22:55.61Z	41813.18	10.655	55.436	-0.99084	237.993 73.733	-67.805
five	E	1985-05-04T05:55:03.24Z	1985-05-04T03:23:28.47Z	42170.21	10.821	36.084	-0.99088	237.355 73.842	-67.709
four	E	1985-05-04T05:55:38.19Z	1985-05-04T03:24:03.41Z	42550.53	10.981	297.213	-0.99084	236.682 73.958	-67.607
alpha	E	1985-05-04T05:58:50.10Z	1985-05-04T03:27:15.34Z	44737.66	11.831	235.907	-0.99084	233.197 74.591	-67.037
beta	E	1985-05-04T06:00:07.03Z	1985-05-04T03:28:32.28Z	45658.65	12.121	82.619	-0.99085	231.897 74.843	-66.806
eta	E	1985-05-04T06:02:09.93Z	1985-05-04T03:30:35.18Z	47176.23	12.573	269.436	-0.99086	229.927 75.243	-66.435
gamma	E	1985-05-04T06:02:45.52Z	1985-05-04T03:31:10.77Z	47625.70	12.699	278.466	-0.99086	229.380 75.358	-66.327
delta	E	1985-05-04T06:03:38.30Z	1985-05-04T03:32:03.56Z	48300.31	12.875	61.640	-0.99086	228.588 75.528	-66.166
lambda	E	1985-05-04T06:05:50.32Z	1985-05-04T03:34:15.58Z	50026.01	13.276	41.695	-0.99086	226.702 75.951	-65.760
epsilon	E	1985-05-04T06:07:12.17Z	1985-05-04T03:35:37.43Z	51121.87	13.511	273.402	-0.99086	225.597 76.211	-65.507

Event geometry at 1985-05-04T05:31:23.0000Z

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Ring opening angle B (deg): -82.24815
Position angle of pole P (deg): 6.68814
Observer-planet distance (km): 2726.448452 x 10^6
Light travel time (sec): 9094.453109

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