

u25\_ctio\_400cm\_2200nm\_predicted\_ring\_event\_times.txt produced Mon Apr 5 00:46:51 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\_u25\_ctio\_400cm

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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: 1985-05-24T07:48:00.0010Z to 1985-05-24T08:47:00.0010Z
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: 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

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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	1985-05-24T07:50:14.83Z	1985-05-24T05:19:47.03Z	50765.27	-15.747	341.047	-0.99073	320.571 59.458	-46.369
lambda	I	1985-05-24T07:51:02.11Z	1985-05-24T05:20:34.31Z	50026.01	-15.519	105.156	-0.99073	319.736 59.288	-46.199
delta	I	1985-05-24T07:52:55.38Z	1985-05-24T05:22:27.58Z	48300.57	-14.932	116.372	-0.99073	317.633 58.881	-45.791
gamma	I	1985-05-24T07:53:41.21Z	1985-05-24T05:23:13.42Z	47621.84	-14.679	330.651	-0.99073	316.740 58.716	-45.626
eta	I	1985-05-24T07:54:11.76Z	1985-05-24T05:23:43.96Z	47176.11	-14.504	319.297	-0.99073	316.130 58.606	-45.516
beta	I	1985-05-24T07:55:57.79Z	1985-05-24T05:25:30.00Z	45672.47	-13.851	123.858	-0.99072	313.923 58.225	-45.134
alpha	I	1985-05-24T07:57:07.93Z	1985-05-24T05:26:40.14Z	44717.90	-13.384	271.255	-0.99070	312.382 57.972	-44.882
four	I	1985-05-24T07:59:58.31Z	1985-05-24T05:29:30.52Z	42538.29	-12.119	316.721	-0.99078	308.365 57.359	-44.268
five	I	1985-05-24T08:00:27.42Z	1985-05-24T05:29:59.63Z	42186.41	-11.885	52.743	-0.99085	307.639 57.254	-44.163
six	I	1985-05-24T08:00:59.32Z	1985-05-24T05:30:31.53Z	41821.91	-11.622	68.812	-0.99060	306.821 57.139	-44.048
six	E	1985-05-24T08:34:20.52Z	1985-05-24T06:03:52.78Z	41794.94	11.590	5.135	-0.99060	243.209 49.915	-36.850
five	E	1985-05-24T08:34:51.77Z	1985-05-24T06:04:24.03Z	42156.73	11.851	347.453	-0.99085	242.410 49.803	-36.738
four	E	1985-05-24T08:35:27.49Z	1985-05-24T06:04:59.75Z	42586.89	12.140	249.808	-0.99078	241.521 49.673	-36.610
alpha	E	1985-05-24T08:38:16.89Z	1985-05-24T06:07:49.15Z	44751.26	13.381	196.343	-0.99070	237.540 49.062	-36.002
beta	E	1985-05-24T08:39:22.82Z	1985-05-24T06:08:55.09Z	45647.24	13.816	45.964	-0.99072	236.094 48.823	-35.765
eta	E	1985-05-24T08:41:10.91Z	1985-05-24T06:10:43.18Z	47176.32	14.477	236.941	-0.99073	233.847 48.433	-35.377
gamma	E	1985-05-24T08:41:41.97Z	1985-05-24T06:11:14.24Z	47628.56	14.651	247.082	-0.99073	233.229 48.321	-35.266
delta	E	1985-05-24T08:42:27.42Z	1985-05-24T06:11:59.69Z	48300.20	14.905	31.024	-0.99073	232.345 48.157	-35.103
lambda	E	1985-05-24T08:44:20.98Z	1985-05-24T06:13:53.25Z	50026.01	15.486	15.611	-0.99073	230.242 47.747	-34.696
epsilon	E	1985-05-24T08:45:41.64Z	1985-05-24T06:15:13.91Z	51290.32	15.864	249.259	-0.99073	228.835 47.455	-34.407

Event geometry at 1985-05-24T08:17:37.0000Z

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Ring opening angle B (deg): -82.19387
Position angle of pole P (deg): 12.32333
Observer-planet distance (km): 2706.439144 x 10^6
Light travel time (sec): 9027.709242

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