

u14\_opmt\_200cm\_2200nm\_predicted\_ring\_event\_times.txt produced Sun Apr 4 21:55:45 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\_u14\_opmt\_200cm

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Event: u14
Planet: Uranus
Reference: French et al. 1986 Icarus 67, 134-163
Title: Structure of the Uranian rings II. Ring orbits and widths.
Computations from: 1982-04-22T01:28:05.0000Z to 1982-04-22T02:58:05.0000Z
Observatory name: Observatoire du Pic du Midi et de Toulouse
Observatory code file directory: /Volumes/dione_raid2/Research/kernels/
Observatory code file: ObsCodes_pck00010_20200709_Elon+ocobs_v9BJ. obs
Observatory code: 586
Observatory abbreviation: opmt
Entry from observatory code file:
  586 G +000 08 32.28 +42 56 11.6      2891 Pic du Midi      pck00010.tpc
Telescope: 200cm
Instrument: Generic InSb High Speed Photometer
Mean wavelength (nm): 2200nm
Observatory latitude (deg): 42.936555556
Observatory E longitude (deg): 0.142300000
Observatory altitude (km): 2.891000000
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: 4678.859107812      11.620454869      4324.313415484
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: 79085
Star number: 56
Star name: U14
Star source catalog: Hipparcos
Star RA (deg): 242.149347400
Star Dec (deg): -20.807432480
Star epoch: 1991-04-02T13:30:00.0000Z
Star parallax (mas): -6.000000000
Star pm RA (mas/yr): -1.160000000
Star pm Dec (mas/yr): 0.450000000
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): 8.814505696      -21.854856960
Time offset for this obstr./event (sec): 3.689064778
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_U11+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	1982-04-22T01:33:42.35Z	1982-04-21T23:03:55.94Z	51509.16	-16.349	152.627	-0.96376	34.016	25.820	-30.837
lambda	I	1982-04-22T01:35:13.49Z	1982-04-21T23:05:27.08Z	50026.01	-16.194	43.051	-0.96376	34.974	25.862	-30.708
delta	I	1982-04-22T01:37:00.71Z	1982-04-21T23:07:14.31Z	48300.21	-15.994	325.004	-0.96376	36.177	25.909	-30.553
gamma	I	1982-04-22T01:37:42.72Z	1982-04-21T23:07:56.33Z	47629.99	-15.909	228.902	-0.96376	36.672	25.927	-30.492
eta	I	1982-04-22T01:38:11.30Z	1982-04-21T23:08:24.91Z	47176.19	-15.848	283.172	-0.96377	37.017	25.939	-30.450
beta	I	1982-04-22T01:39:48.77Z	1982-04-21T23:10:02.38Z	45642.37	-15.631	339.555	-0.96375	38.242	25.978	-30.306
alpha	I	1982-04-22T01:40:49.22Z	1982-04-21T23:11:02.83Z	44699.82	-15.483	303.686	-0.96380	39.050	26.001	-30.216
four	I	1982-04-22T01:43:07.69Z	1982-04-21T23:13:21.31Z	42579.56	-15.110	100.564	-0.96388	41.026	26.050	-30.006
five	I	1982-04-22T01:43:31.44Z	1982-04-21T23:13:45.07Z	42219.97	-15.040	280.757	-0.96372	41.388	26.058	-29.970
six	I	1982-04-22T01:43:59.17Z	1982-04-21T23:14:12.80Z	41804.72	-14.954	40.032	-0.96404	41.812	26.067	-29.927
six	E	1982-04-22T02:43:19.30Z	1982-04-22T00:13:33.16Z	41872.54	14.983	145.924	-0.96404	147.814	25.775	-23.304
five	E	1982-04-22T02:43:37.74Z	1982-04-22T00:13:51.61Z	42163.76	15.043	27.366	-0.96372	148.100	25.766	-23.264
four	E	1982-04-22T02:44:07.92Z	1982-04-22T00:14:21.79Z	42611.30	15.130	207.991	-0.96388	148.554	25.751	-23.199
alpha	E	1982-04-22T02:46:24.00Z	1982-04-22T00:16:37.88Z	44699.18	15.499	55.035	-0.96380	150.493	25.680	-22.905
beta	E	1982-04-22T02:47:25.73Z	1982-04-22T00:17:39.61Z	45662.13	15.649	92.535	-0.96375	151.314	25.647	-22.770
eta	E	1982-04-22T02:49:01.85Z	1982-04-22T00:19:15.74Z	47176.11	15.864	38.592	-0.96377	152.525	25.593	-22.560
gamma	E	1982-04-22T02:49:29.86Z	1982-04-22T00:19:43.75Z	47621.34	15.923	345.014	-0.96376	152.863	25.577	-22.498
delta	E	1982-04-22T02:50:12.39Z	1982-04-22T00:20:26.28Z	48300.41	16.009	82.110	-0.96376	153.364	25.552	-22.405
lambda	E	1982-04-22T02:51:59.51Z	1982-04-22T00:22:13.41Z	50026.01	16.210	162.565	-0.96376	154.567	25.488	-22.168
epsilon	E	1982-04-22T02:53:06.71Z	1982-04-22T00:23:20.61Z	51119.30	16.326	273.810	-0.96376	155.280	25.446	-22.018

Event geometry at 1982-04-22T02:14:23.0000Z

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Ring opening angle B (deg): -74.52839
Position angle of pole P (deg): 71.13346
Observer-planet distance (km): 2695.078619 x 10^6
Light travel time (sec): 8989.814611

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