

u14\_lco\_100cm\_880nm\_predicted\_ring\_event\_times.txt produced Sun Apr 4 20:20:48 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\_lco\_100cm

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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: 1982-04-22T01:10:31.0000Z to 1982-04-22T03:24:22.0000Z
Observatory name: Las Campanas Observatory
Observatory code file directory: /Volumes/dione_raid2/Research/kernels/
Observatory code file: ObsCodes_pck00010_20200709_Elon+ocobs_v9BJ.obs
Observatory code: 304
Observatory abbreviation: lco
Entry from observatory code file:
  304 G +289 17 52.80 -29 00 12.8          2270 Las Campanas Observatory          pck00010.tpc
Telescope: 100cm
Instrument: Generic InSb High Speed Photometer
Mean wavelength (nm): 880nm
Observatory latitude (deg): -29.003555556
Observatory E longitude (deg): 289.298000000
Observatory altitude (km): 2.270000000
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: 1845.617303240 -5270.845524126 -3075.346302194
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): 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_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	1982-04-22T01:33:28.86Z	1982-04-21T23:03:38.74Z	51466.58	-17.500	141.672	-0.96376	23.065 18.777	-43.198
lambda	I	1982-04-22T01:34:51.30Z	1982-04-21T23:05:01.19Z	50026.01	-17.444	31.694	-0.96376	23.621 19.069	-43.493
delta	I	1982-04-22T01:36:30.44Z	1982-04-21T23:06:40.34Z	48300.25	-17.370	313.164	-0.96376	24.334 19.421	-43.847
gamma	I	1982-04-22T01:37:09.01Z	1982-04-21T23:07:18.92Z	47630.75	-17.339	216.857	-0.96376	24.625 19.558	-43.985
eta	I	1982-04-22T01:37:35.24Z	1982-04-21T23:07:45.15Z	47176.23	-17.316	270.986	-0.96377	24.828 19.652	-44.079
beta	I	1982-04-22T01:39:03.94Z	1982-04-21T23:09:13.85Z	45644.38	-17.237	326.859	-0.96375	25.543 19.967	-44.395
alpha	I	1982-04-22T01:39:58.27Z	1982-04-21T23:10:08.18Z	44706.68	-17.182	290.652	-0.96380	26.009 20.160	-44.589
four	I	1982-04-22T01:42:03.04Z	1982-04-21T23:12:12.96Z	42568.64	-17.047	86.691	-0.96388	27.153 20.604	-45.033
five	I	1982-04-22T01:42:22.31Z	1982-04-21T23:12:32.23Z	42239.56	-17.024	266.710	-0.96372	27.341 20.673	-45.102
six	I	1982-04-22T01:42:48.13Z	1982-04-21T23:12:58.05Z	41799.01	-16.990	25.811	-0.96404	27.597 20.765	-45.194
Atmosphere	I	1982-04-22T01:58:52.38Z						24.206	-48.599
Atmosphere	E	1982-04-22T02:36:47.21Z						32.416	-56.422
six	E	1982-04-22T02:51:55.56Z	1982-04-22T00:22:05.77Z	41877.16	17.118	159.470	-0.96404	161.383 35.710	-59.400
five	E	1982-04-22T02:52:12.16Z	1982-04-22T00:22:22.37Z	42174.25	17.142	40.785	-0.96373	161.546 35.771	-59.453
four	E	1982-04-22T02:52:37.64Z	1982-04-22T00:22:47.85Z	42605.37	17.173	221.208	-0.96388	161.795 35.863	-59.535
alpha	E	1982-04-22T02:54:39.20Z	1982-04-22T00:24:49.42Z	44705.61	17.316	67.439	-0.96380	162.913 36.306	-59.925
beta	E	1982-04-22T02:55:34.45Z	1982-04-22T00:25:44.67Z	45666.31	17.375	104.590	-0.96375	163.387 36.507	-60.102
eta	E	1982-04-22T02:57:01.18Z	1982-04-22T00:27:11.41Z	47176.13	17.458	50.143	-0.96377	164.093 36.822	-60.378
gamma	E	1982-04-22T02:57:26.65Z	1982-04-22T00:27:36.88Z	47621.17	17.482	356.428	-0.96376	164.291 36.915	-60.459
delta	E	1982-04-22T02:58:05.47Z	1982-04-22T00:28:15.70Z	48300.46	17.515	93.321	-0.96376	164.587 37.056	-60.582
lambda	E	1982-04-22T02:59:43.76Z	1982-04-22T00:29:54.00Z	50026.01	17.596	173.288	-0.96376	165.300 37.414	-60.892
epsilon	E	1982-04-22T03:00:41.70Z	1982-04-22T00:30:51.94Z	51046.76	17.639	284.220	-0.96376	165.698 37.625	-61.074

Event geometry at 1982-04-22T02:17:51.0000Z

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Ring opening angle B (deg): -74.52839
Position angle of pole P (deg): 71.13346
Observer-planet distance (km): 2695.052301 x 10^6
Light travel time (sec): 8989.726823

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