

u103\_eso\_220cm\_2200nm\_predicted\_ring\_event\_times.txt produced Mon Apr 5 12:08:34 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\_u103\_eso\_220cm

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Event: u103
Planet: Uranus
Reference: French, R. G. et al. Icarus 119, 269-284 (1996)
Title: Earth-Based Detection of Uranus's 200°231 Lambda Ring
Computations from: 1992-07-11T07:52:37.0000Z to 1992-07-11T09:06:20.6700Z
Observatory name: European Southern Observatory
Observatory code file directory: /Volumes/dione RAID2/Research/kernels/
Observatory code file: ObsCodes_pck00010_20200709_Elon+ocobs_v9BJ.obs
Observatory code: ES2
Observatory abbreviation: eso
Entry from observatory code file:
  ES2 G +289 15 48.04 -29 15 28.1      2317 European Southern Observatory, La Silla-DSS 2m      pck00010.tpc
Telescope: 220cm
Instrument: Generic InSb High Speed Photometer
Mean wavelength (nm): 2200nm
Observatory latitude (deg): -29.257805556
Observatory E longitude (deg): 289.263344444
Observatory altitude (km): 2.317000000
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: 1837.914952828 -5259.044662203 -3099.994082776
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: 22794421
Star number: 28
Star name: U103
Star source catalog: UCAC2
Star RA (deg): 287.398335900
Star Dec (deg): -22.911413700
Star epoch: 2000-01-01T00:00:00.0000Z
Star parallax (mas): 0.000000000
Star pm RA (mas/yr): -2.200000000
Star pm Dec (mas/yr): -7.000000000
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): -6.689287744 13.182224691
Time offset for this obstr./event (sec): 0.092828740
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	1992-07-11T07:58:29.59Z	1992-07-11T05:24:24.36Z	51350.40	-18.180	120.081	-0.87111	50.898 44.042	-46.859
lambda	I	1992-07-11T07:59:43.45Z	1992-07-11T05:25:38.22Z	50026.01	-17.672	319.075	-0.87111	52.461 43.773	-46.591
delta	I	1992-07-11T08:01:23.20Z	1992-07-11T05:27:17.96Z	48300.38	-16.913	77.175	-0.87111	54.704 43.411	-46.228
gamma	I	1992-07-11T08:02:03.10Z	1992-07-11T05:27:57.86Z	47631.82	-16.588	181.904	-0.87111	55.647 43.266	-46.084
eta	I	1992-07-11T08:02:30.78Z	1992-07-11T05:28:25.54Z	47176.08	-16.349	22.539	-0.87111	56.316 43.165	-45.983
beta	I	1992-07-11T08:04:06.95Z	1992-07-11T05:30:01.71Z	45642.54	-15.485	338.236	-0.87115	58.744 42.816	-45.634
alpha	I	1992-07-11T08:05:07.84Z	1992-07-11T05:31:02.60Z	44716.37	-14.887	86.169	-0.87123	60.366 42.595	-45.413
four	I	1992-07-11T08:07:38.15Z	1992-07-11T05:33:32.90Z	42608.56	-13.269	145.363	-0.87088	64.641 42.050	-44.867
five	I	1992-07-11T08:08:08.94Z	1992-07-11T05:34:03.68Z	42184.73	-12.879	51.244	-0.87159	65.600 41.938	-44.755
six	I	1992-07-11T08:08:34.19Z	1992-07-11T05:34:28.93Z	41878.70	-12.590	193.459	-0.87138	66.354 41.846	-44.663
six	E	1992-07-11T08:34:47.16Z	1992-07-11T06:00:41.82Z	41850.73	12.554	251.598	-0.87138	124.531 36.155	-38.962
five	E	1992-07-11T08:35:19.20Z	1992-07-11T06:01:13.87Z	42263.87	12.945	111.123	-0.87159	125.537 36.039	-38.846
four	E	1992-07-11T08:35:45.72Z	1992-07-11T06:01:40.38Z	42611.66	13.261	207.007	-0.87088	126.337 35.943	-38.751
alpha	E	1992-07-11T08:38:17.49Z	1992-07-11T06:04:12.15Z	44749.79	14.883	156.397	-0.87123	130.655 35.396	-38.202
beta	E	1992-07-11T08:39:16.64Z	1992-07-11T06:05:11.29Z	45648.75	15.459	51.669	-0.87115	132.229 35.183	-37.988
eta	E	1992-07-11T08:40:52.73Z	1992-07-11T06:06:47.38Z	47176.26	16.321	100.817	-0.87111	134.648 34.837	-37.641
gamma	E	1992-07-11T08:41:20.18Z	1992-07-11T06:07:14.82Z	47627.27	16.550	261.527	-0.87111	135.310 34.738	-37.542
delta	E	1992-07-11T08:42:00.49Z	1992-07-11T06:07:55.13Z	48300.71	16.872	158.677	-0.87111	136.260 34.593	-37.396
lambda	E	1992-07-11T08:43:40.48Z	1992-07-11T06:09:35.12Z	50026.01	17.623	45.072	-0.87111	138.502 34.233	-37.035
epsilon	E	1992-07-11T08:45:02.93Z	1992-07-11T06:10:57.57Z	51502.39	18.189	209.381	-0.87111	140.236 33.936	-36.737

Event geometry at 1992-07-11T08:19:55.0000Z

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Ring opening angle B (deg): -60.58792
Position angle of pole P (deg): 279.85340
Observer-planet distance (km): 2771.708454 x 10^6
Light travel time (sec): 9245.424225

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