

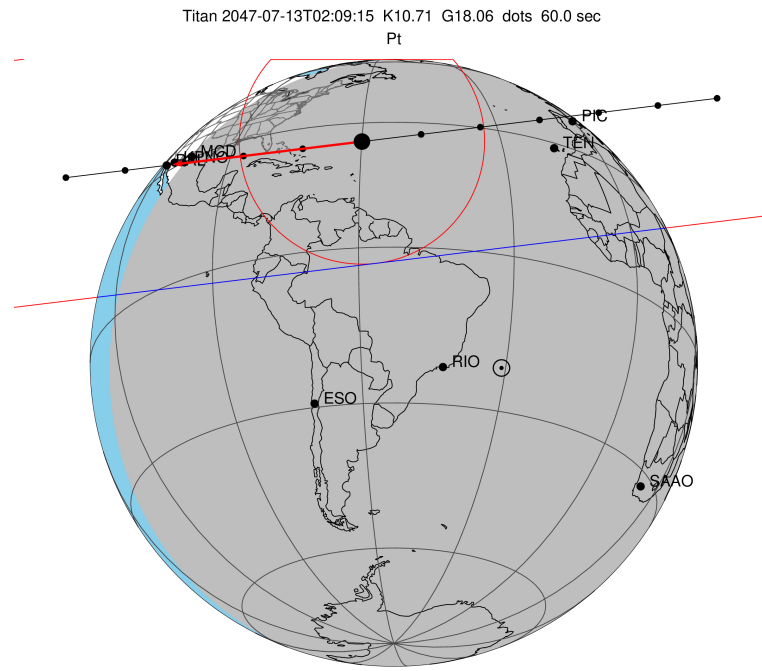
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-07-13T02:09:15.330  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4070287489344978304  
 2Mass ID (if available) : 17564246-2224322

ICRS Star Coord at Epoch: 17h 56m 42.45821s -22:24:32.32919s  
 RUWE (>1.4 is poor) : 1.00  
 K magnitude : 10.706  
 G magnitude : 18.060  
 RP magnitude : 16.879  
 BP magnitude : 19.715  
 DUPflag : 0  
 Distance (au) : 9.087  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -20.87  
 Sun-Target sep (deg) : 159.21  
 Sun-Moon sep (deg) : 89.37  
 B (ring opening deg) : 26.56  
 PA of pole (deg) : 5.60  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.710  
 C/A sky separation (km) : 4682.2  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

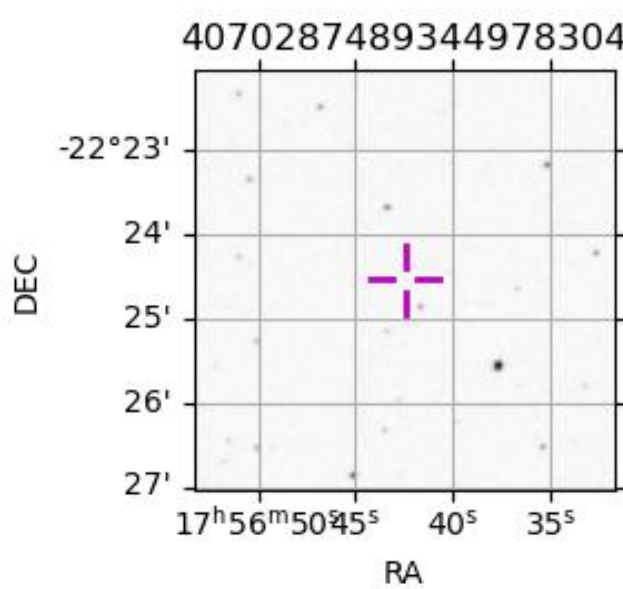
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUL 13 02:03 - JUL 13 02:07	Pie
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JUL 13 02:04 - JUL 13 02:08	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



2047-07-13T02:09:15.3300 α: 17 56 42.4582 δ: -22 24 32.329 C/A 0.713" PA 353.05 deg v\_sky -20.87 km/s D 09.09 AU  
 Credit: Styled after SORA/Lucky Star



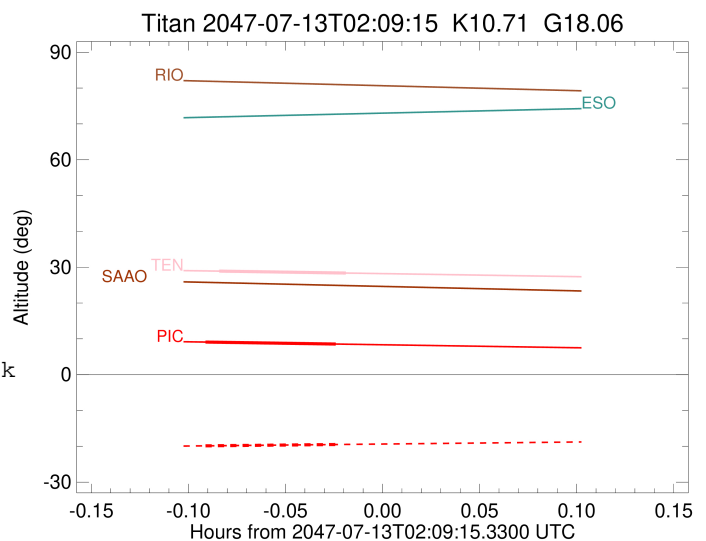
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-07-13T02:05:47.880
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : PIC
Location             : Pic du Midi
Latitude (deg)       : 42.93656
E. Longitude (deg)   : 0.14231
Altitude (km)        : 2.890
Gaia source ID       : 4070287489344978304
2Mass ID (if available) : 17564246-2224322
ICRS Star Coord at Epoch: 17h 56m 42.45821s -22:24:32.32919s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 10.706
G magnitude          : 18.060
RP magnitude         : 16.879
BP magnitude         : 19.715
DUPflag             : 0
Distance (au)        : 9.087
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -20.87
Sun-Target sep (deg) : 159.21
Sun-Moon sep (deg)   : 89.50
B (ring opening deg) : 26.56
PA of pole (deg)     : 5.60
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.017
C/A sky separation (km) : 110.5
NAIF SPICE kernels   : RAJobs_U111+rgf16.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk

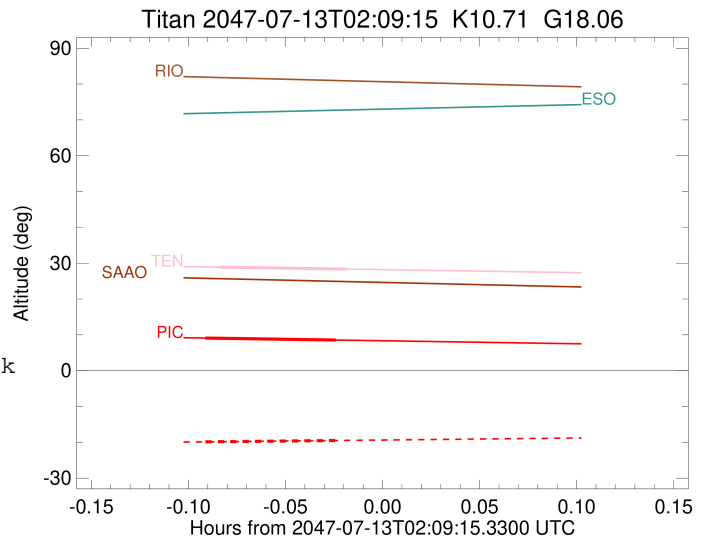
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x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-07-13T02:03:45.714	9.10	-19.87	2575.1	-13.09	-13.10
Titan	E	2047-07-13T02:07:50.052	8.54	-19.50	2575.1	8.71	8.71



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-07-13T02:06:10.520  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Observer code : TEN  
 Location : Teide Obs./Tenerife  
 Latitude (deg) : 28.30050  
 E. Longitude (deg) : 343.48909  
 Altitude (km) : 2.395  
 Gaia source ID : 4070287489344978304  
 2Mass ID (if available) : 17564246-2224322  
 ICRS Star Coord at Epoch: 17h 56m 42.45821s -22:24:32.32919s  
 RUWE (>1.4 is poor) : 1.00  
 K magnitude : 10.706  
 G magnitude : 18.060  
 RP magnitude : 16.879  
 BP magnitude : 19.715  
 DUPflag : 0  
 Distance (au) : 9.087  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -20.87  
 Sun-Target sep (deg) : 159.21  
 Sun-Moon sep (deg) : 89.80  
 B (ring opening deg) : 26.56  
 PA of pole (deg) : 5.60  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.095  
 C/A sky separation (km) : 623.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk  
 URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp  
 de440.bsp  
 earth\_720101\_070426.bpc  
 jup365.bsp  
 urall6.bsp  
 IAU\_SATURN\_for\_RINGFIT.tpc  
 pck00010.tpc  
 earth\_200101\_990628\_predict.bpc  
 IAU\_NEPTUNE\_for\_RINGFIT.tpc.BECAREFUL  
 uranus\_ringframes\_rfrench20220627\_v1.tf  
 neptune\_ringframes\_rfrench20220702a\_v1.tf  
 earth\_flat\_IAU.spk



x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-07-13T02:04:12.583	28.90	-38.44	2575.1	-23.27	-23.28
Titan	E	2047-07-13T02:08:08.461	28.36	-38.20	2575.2	-1.63	-1.63