

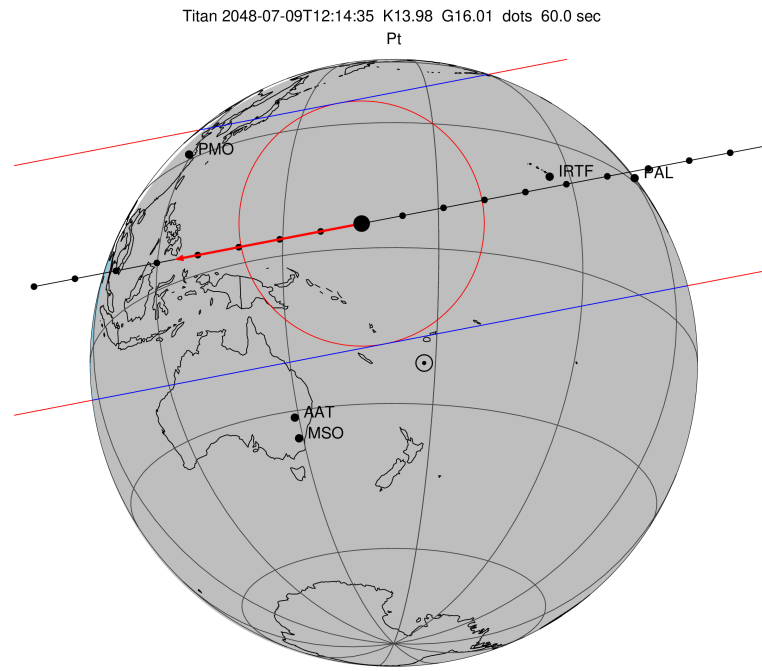
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2048-07-09T12:14:35.450  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4078698139146461312  
 2Mass ID (if available) : 18501031-2222143

ICRS Star Coord at Epoch: 18h 50m 10.30197s -22:22:14.40165s  
 RUWE (>1.4 is poor) : 0.98  
 K magnitude : 13.984  
 G magnitude : 16.009  
 RP magnitude : 15.316  
 BP magnitude : 16.519  
 DUPflag : 0  
 Distance (au) : 9.031  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.60  
 Sun-Target sep (deg) : 174.26  
 Sun-Moon sep (deg) : 167.50  
 B (ring opening deg) : 25.22  
 PA of pole (deg) : 6.48  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.456  
 C/A sky separation (km) : 2989.0  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

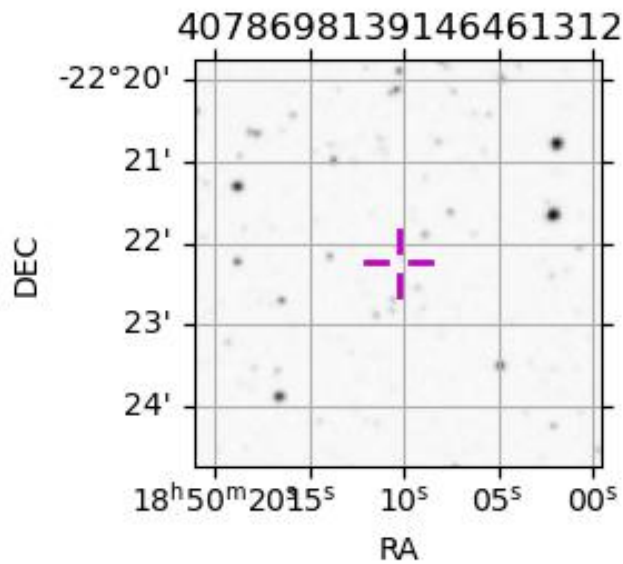
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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

Obs	Location	lat	Elon	Target	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	JUL 09 12:16 - JUL 09 12:19	Pie
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			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 09 12:07 - JUL 09 12:13	Pie
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



2048-07-09T12:14:35.4500 cc: 18 50 10.3020 & -22 22 14.402 C/A 0.458" PA 349.10 deg v\_sky -14.59 km/s D 09.03 AU  
 Credit: Styled after SORA/Lucky Star

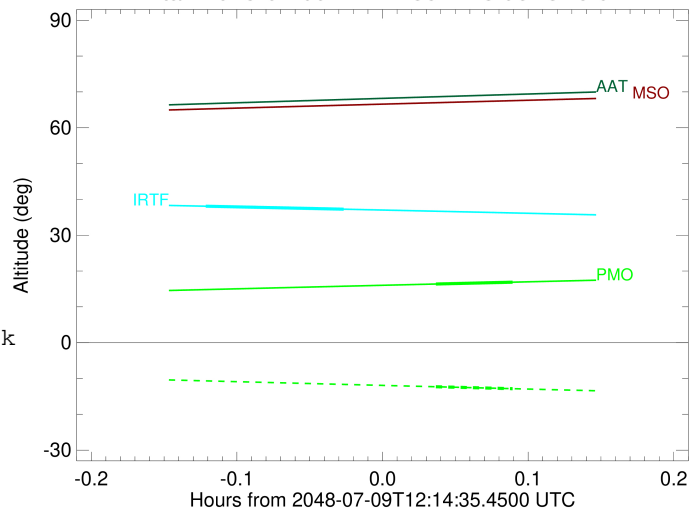


```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2048-07-09T12:18:21.940
Event type            : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code         : PMO
Location              : Purple Mtn Obs. Nanking
Latitude (deg)        : 32.06667
E. Longitude (deg)    : 118.82089
Altitude (km)         : 0.364
Gaia source ID        : 4078698139146461312
2Mass ID (if available) : 18501031-2222143
ICRS Star Coord at Epoch: 18h 50m 10.30197s -22:22:14.40165s
RUWE (>1.4 is poor)  : 0.98
K magnitude           : 13.984
G magnitude           : 16.009
RP magnitude          : 15.316
BP magnitude          : 16.519
DUPflag              : 0
Distance (au)         : 9.031
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -14.60
Sun-Target sep (deg)  : 174.26
Sun-Moon sep (deg)    : 167.02
B (ring opening deg)  : 25.22
PA of pole (deg)      : 6.48
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.327
C/A sky separation (km) : 2138.9
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

```

Titan 2048-07-09T12:14:35 K13.98 G16.01

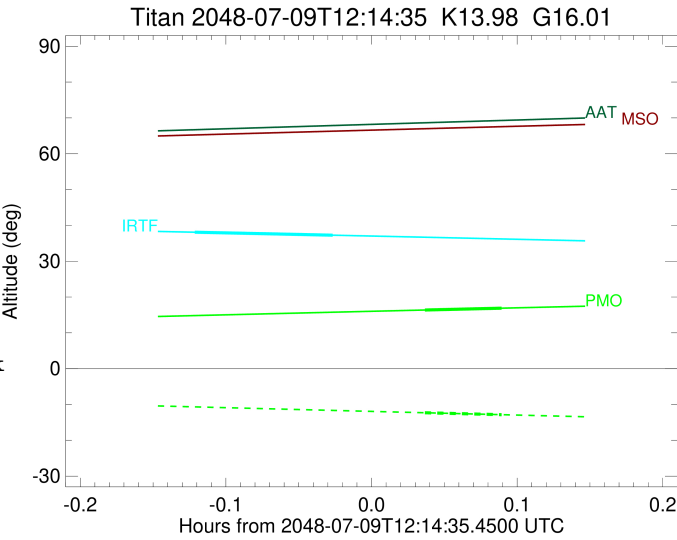


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-07-09T12:16:45.409	16.37	-12.30	2575.1	34.29	34.31
Titan	E	2048-07-09T12:19:58.443	16.88	-12.85	2575.1	60.32	60.33

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2048-07-09T12:10:09.890
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : IRTF
Location             : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 4078698139146461312
2Mass ID (if available) : 18501031-2222143
ICRS Star Coord at Epoch: 18h 50m 10.30197s -22:22:14.40165s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 13.984
G magnitude           : 16.009
RP magnitude          : 15.316
BP magnitude          : 16.519
DUPflag              : 0
Distance (au)        : 9.031
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.60
Sun-Target sep (deg) : 174.26
Sun-Moon sep (deg)   : 168.11
B (ring opening deg) : 25.22
PA of pole (deg)     : 6.48
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.038
C/A sky separation (km) : 246.0
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	2048-07-09T12:07:18.350	38.09	-41.46	2575.1	-10.19	-10.19
Titan	E	2048-07-09T12:13:01.471	37.25	-40.75	2575.1	20.01	20.02