

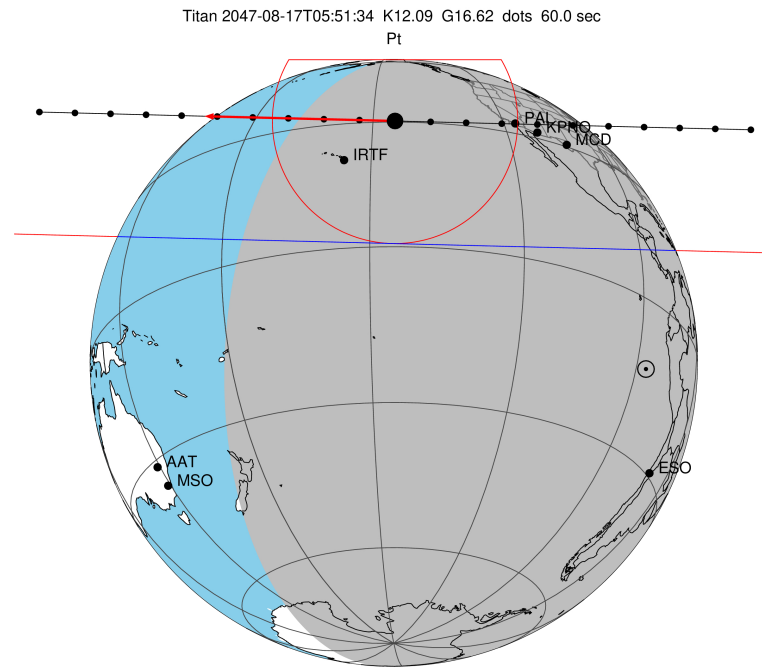
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-08-17T05:51:34.460  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4068971069072274688  
 2Mass ID (if available) : 17491068-2228476

ICRS Star Coord at Epoch: 17h 49m 10.69312s -22:28:47.59946s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 12.093  
 G magnitude : 16.616  
 RP magnitude : 15.299  
 BP magnitude : 17.845  
 DUPflag : 0  
 Distance (au) : 9.439  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -12.45  
 Sun-Target sep (deg) : 123.87  
 Sun-Moon sep (deg) : 174.34  
 B (ring opening deg) : 26.80  
 PA of pole (deg) : 5.45  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.742  
 C/A sky separation (km) : 5080.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

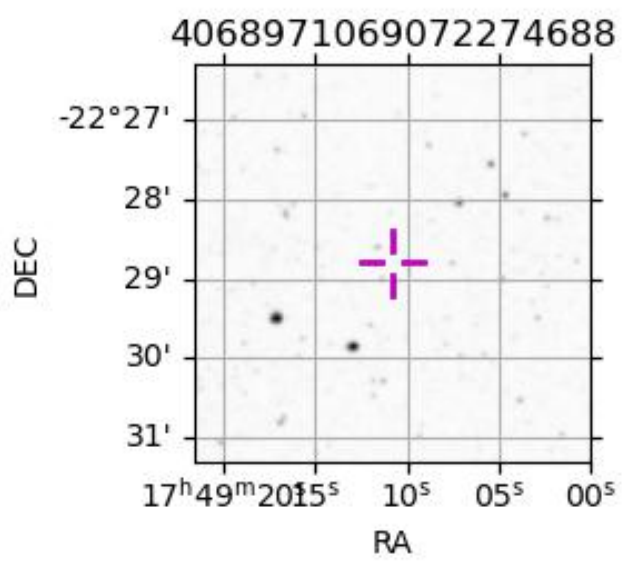
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	AUG 17 05:45 - AUG 17 05:51	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	AUG 17 05:44 - AUG 17 05:51	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	AUG 17 05:43 - AUG 17 05:50	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	AUG 17 05:49 - AUG 17 05:56	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



2047-08-17T05:51:34.4600 α: 17 49 10.6931 δ: -22 28 47.599 C/A 0.742" PA 1.43 deg v\_sky -12.45 km/s D 09.44 AU  
 Credit: Styled after SORA/Lucky Star



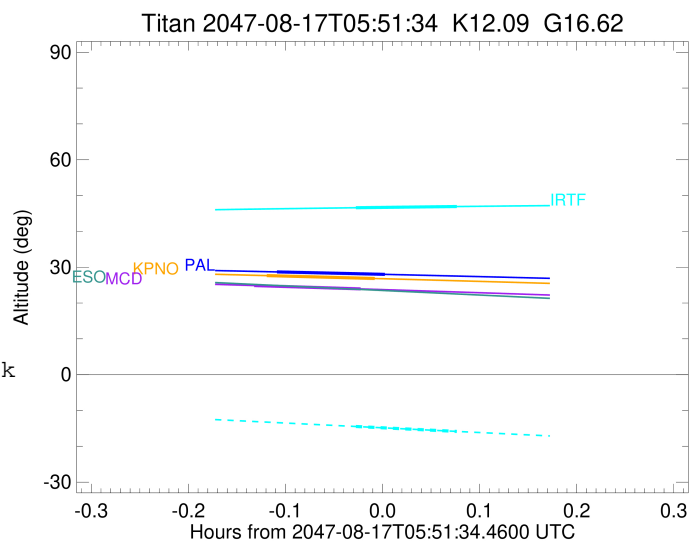
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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-08-17T05:48:22.840
Event type            : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code         : PAL
Location              : Palomar Mt (200")
Latitude (deg)        : 33.35622
E. Longitude (deg)    : 243.13601
Altitude (km)         : 1.706
Gaia source ID        : 4068971069072274688
2Mass ID (if available) : 17491068-2228476
ICRS Star Coord at Epoch: 17h 49m 10.69312s -22:28:47.59946s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 12.093
G magnitude           : 16.616
RP magnitude          : 15.299
BP magnitude          : 17.845
DUPflag              : 0
Distance (au)         : 9.439
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.45
Sun-Target sep (deg)  : 123.87
Sun-Moon sep (deg)   : 174.25
B (ring opening deg) : 26.80
PA of pole (deg)     : 5.45
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.001
C/A sky separation (km) : 5.3
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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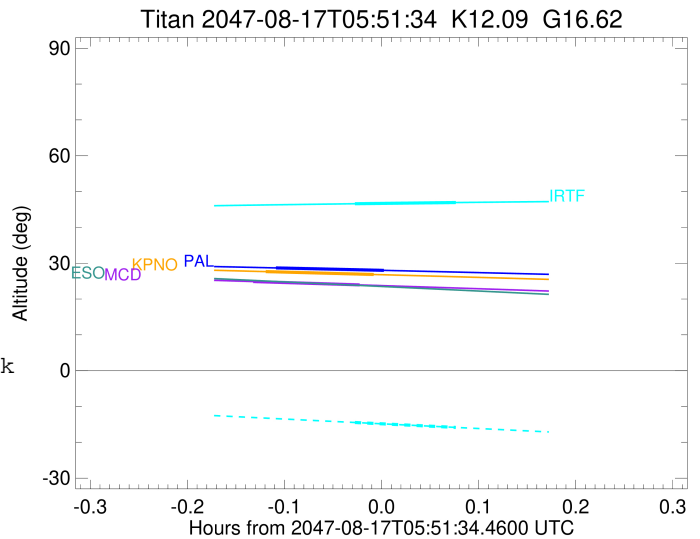
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-08-17T05:45:01.686	28.68	-34.48	2575.1	-3.44	-3.45
Titan	E	2047-08-17T05:51:44.059	27.99	-35.34	2575.1	3.25	3.25



```

target           : Titan
target radius (km) : 2575.15
C/A epoch       : 2047-08-17T05:47:45.860
Event type      : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code   : KPNO
Location        : Kitt Peak Natl Obs
Latitude (deg)  : 31.96333
E. Longitude (deg) : 248.40000
Altitude (km)   : 2.120
Gaia source ID  : 4068971069072274688
2Mass ID (if available) : 17491068-2228476
ICRS Star Coord at Epoch: 17h 49m 10.69312s -22:28:47.59946s
RUWE (>1.4 is poor) : 1.02
K magnitude     : 12.093
G magnitude     : 16.616
RP magnitude    : 15.299
BP magnitude    : 17.845
DUPflag        : 0
Distance (au)   : 9.439
f0 (km)         : 0.00
g0 (km)         : 0.00
skyplane vel. (km/s) : -12.45
Sun-Target sep (deg) : 123.87
Sun-Moon sep (deg) : 174.18
B (ring opening deg) : 26.80
PA of pole (deg) : 5.45
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.026
C/A sky separation (km) : 180.5
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

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Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-08-17T05:44:25.029	27.65	-38.14	2575.1	-6.89	-6.89
Titan	E	2047-08-17T05:51:06.777	26.84	-38.90	2575.2	-0.30	-0.30

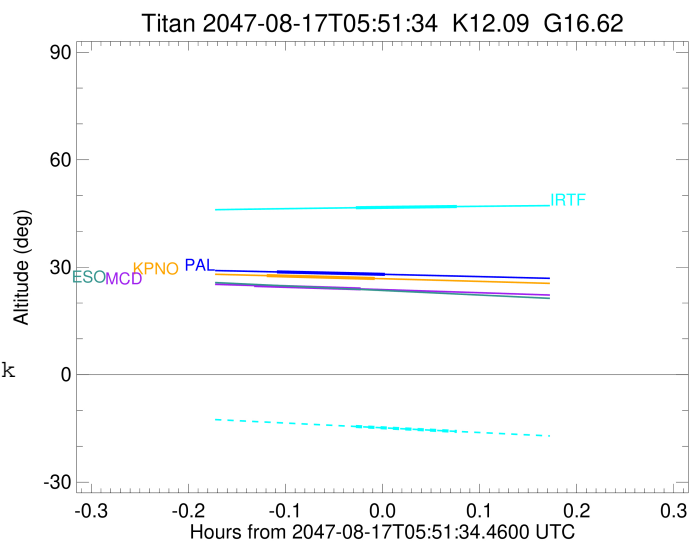
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-08-17T05:46:56.540
Event type            : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code         : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)        : 30.67158
E. Longitude (deg)    : 255.97844
Altitude (km)         : 2.075
Gaia source ID        : 4068971069072274688
2Mass ID (if available) : 17491068-2228476
ICRS Star Coord at Epoch: 17h 49m 10.69312s -22:28:47.59946s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 12.093
G magnitude           : 16.616
RP magnitude          : 15.299
BP magnitude          : 17.845
DUPflag              : 0
Distance (au)         : 9.439
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.45
Sun-Target sep (deg)  : 123.87
Sun-Moon sep (deg)    : 174.08
B (ring opening deg) : 26.80
PA of pole (deg)      : 5.45
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.061
C/A sky separation (km) : 418.6
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

```

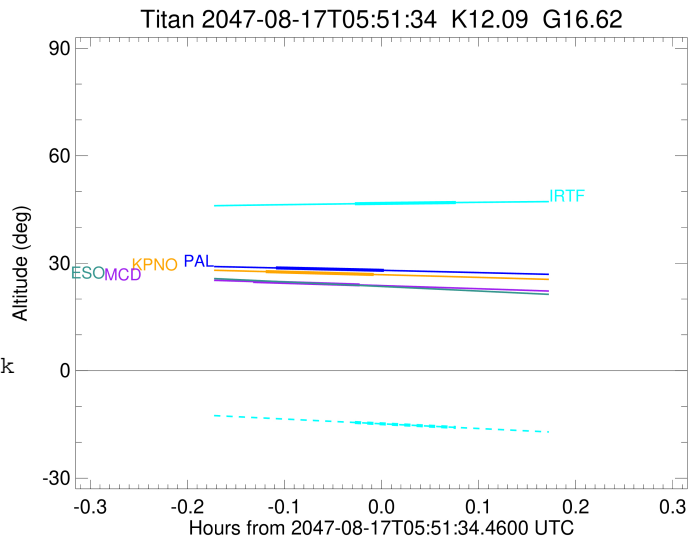
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-08-17T05:43:37.506	24.87	-42.37	2575.1	-11.57	-11.57
Titan	E	2047-08-17T05:50:15.665	23.93	-42.97	2575.1	-5.13	-5.13



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-08-17T05:53:02.310
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       : 4068971069072274688
2Mass ID (if available) : 17491068-2228476
ICRS Star Coord at Epoch: 17h 49m 10.69312s -22:28:47.59946s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 12.093
G magnitude           : 16.616
RP magnitude         : 15.299
BP magnitude         : 17.845
DUPflag              : 0
Distance (au)        : 9.439
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.45
Sun-Target sep (deg) : 123.87
Sun-Moon sep (deg)   : 174.75
B (ring opening deg) : 26.80
PA of pole (deg)     : 5.45
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.124
C/A sky separation (km): 849.1
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

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Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-08-17T05:49:53.606	46.59	-14.46	2575.1	-20.80	-20.81
Titan	E	2047-08-17T05:56:11.020	46.93	-15.84	2575.1	-13.43	-13.43