

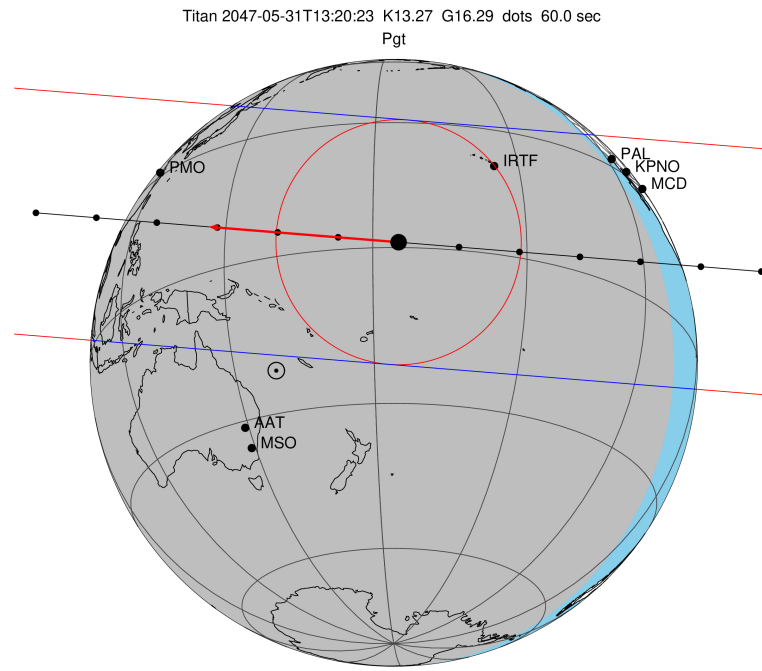
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-05-31T13:20:23.000  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4069718285917636608  
 2Mass ID (if available) : 18092471-2220056

ICRS Star Coord at Epoch: 18h 09m 24.71567s -22:20:05.68258s  
 RUWE (>1.4 is poor) : 1.10  
 K magnitude : 13.267  
 G magnitude : 16.288  
 RP magnitude : 15.338  
 BP magnitude : 17.164  
 DUPflag : 0  
 Distance (au) : 9.099  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -21.22  
 Sun-Target sep (deg) : 157.19  
 Sun-Moon sep (deg) : 124.69  
 B (ring opening deg) : 26.19  
 PA of pole (deg) : 5.84  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.385  
 C/A sky separation (km) : 2544.0  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

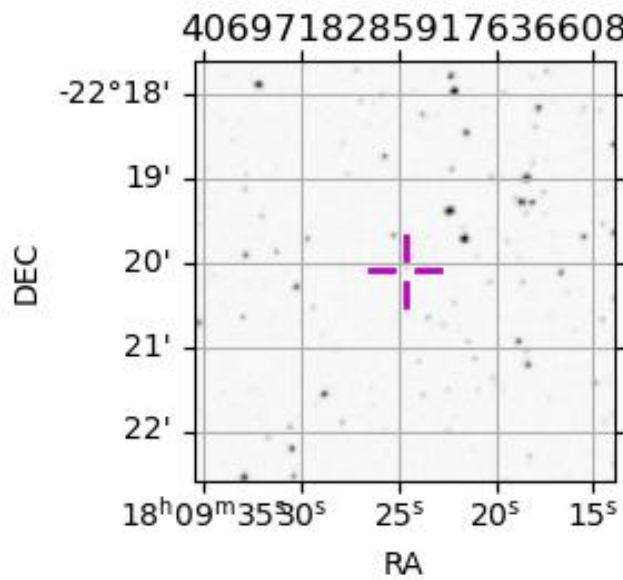
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
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	+ +	MAY 31 13:22 - MAY 31 13:26	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	+ +	MAY 31 13:17 - MAY 31 13:20	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



2047-05-31T13:20:23.0000 α: 18 09 24.7157 δ: -22 20 05.683 C/A 0.384" PA 4.63 deg v\_sky -21.22 km/s D 09:10 AU  
 Credit: Styled after SORA/Lucky Star

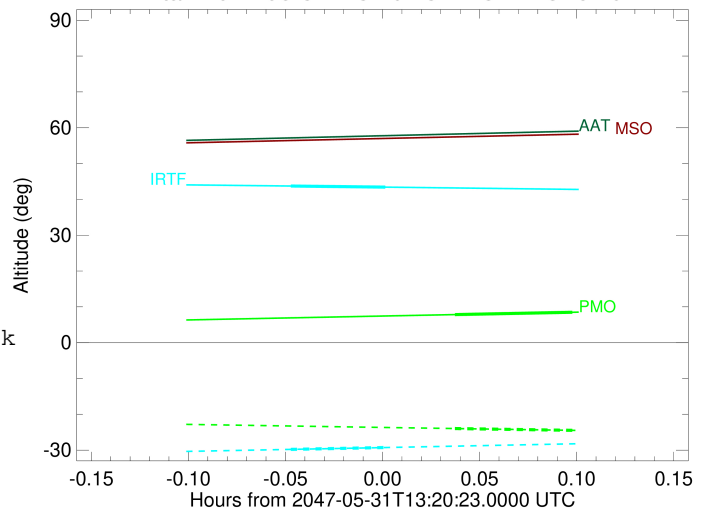


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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-05-31T13:24:25.740
Event type            : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code         : PMO
Location              : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)   : 118.82089
Altitude (km)        : 0.364
Gaia source ID       : 4069718285917636608
2Mass ID (if available) : 18092471-2220056
ICRS Star Coord at Epoch: 18h 09m 24.71567s -22:20:05.68258s
RUWE (>1.4 is poor) : 1.10
K magnitude           : 13.267
G magnitude           : 16.288
RP magnitude          : 15.338
BP magnitude          : 17.164
DUPflag              : 0
Distance (au)        : 9.099
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -21.22
Sun-Target sep (deg) : 157.19
Sun-Moon sep (deg)  : 125.18
B (ring opening deg) : 26.19
PA of pole (deg)    : 5.84
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.165
C/A sky separation (km) : 1086.5
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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Titan 2047-05-31T13:20:23 K13.27 G16.29



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

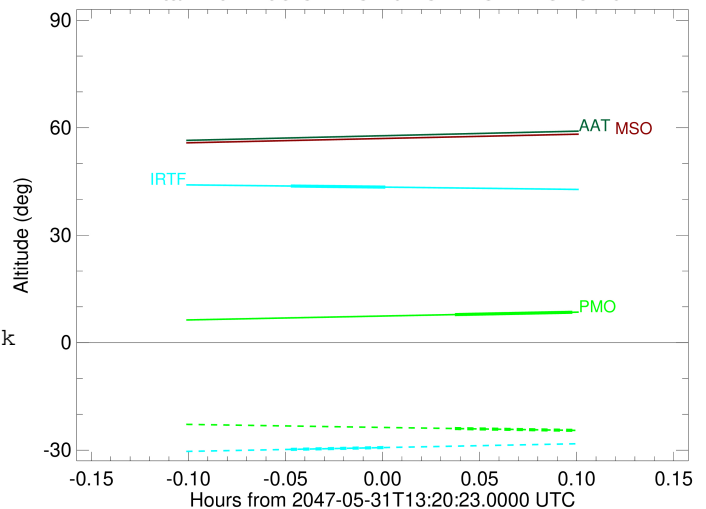
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-05-31T13:22:36.536	7.83	-23.97	2575.1	20.84	20.85
Titan	E	2047-05-31T13:26:14.931	8.48	-24.47	2575.1	23.64	23.66

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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-05-31T13:19:00.360
Event type            : Pgt
: Titan occs: geocentric, topocentric
: 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        : 4069718285917636608
2Mass ID (if available) : 18092471-2220056
ICRS Star Coord at Epoch: 18h 09m 24.71567s -22:20:05.68258s
RUWE (>1.4 is poor) : 1.10
K magnitude           : 13.267
G magnitude           : 16.288
RP magnitude          : 15.338
BP magnitude          : 17.164
DUPflag              : 0
Distance (au)         : 9.099
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -21.22
Sun-Target sep (deg)  : 157.19
Sun-Moon sep (deg)    : 125.02
B (ring opening deg) : 26.19
PA of pole (deg)     : 5.84
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.262
C/A sky separation (km) : 1732.0
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

```

Titan 2047-05-31T13:20:23 K13.27 G16.29



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	2047-05-31T13:17:32.302	43.72	-29.79	2575.1	36.17	36.19
Titan	E	2047-05-31T13:20:28.436	43.41	-29.27	2575.1	38.06	38.08