

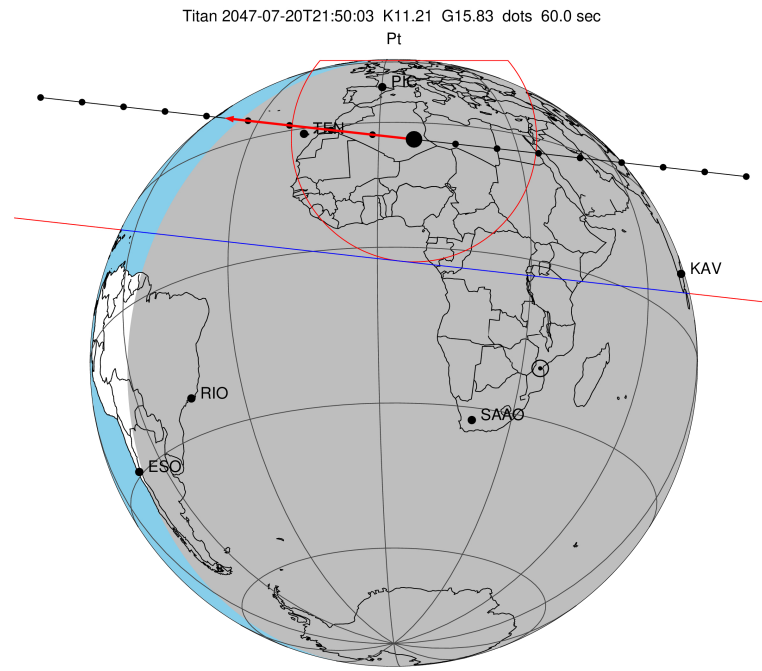
target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-07-20T21:50:03.990
 Event type : Pt
 : Titan occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 4070241932705611008
 2Mass ID (if available) : 17540972-2223454

ICRS Star Coord at Epoch: 17h 54m 09.71306s -22:23:45.54951s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 11.206
 G magnitude : 15.825
 RP magnitude : 14.565
 BP magnitude : 17.276
 DUPflag : 0
 Distance (au) : 9.146
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.62
 Sun-Target sep (deg) : 151.17
 Sun-Moon sep (deg) : 175.03
 B (ring opening deg) : 26.61
 PA of pole (deg) : 5.55
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.712
 C/A sky separation (km) : 4724.0
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk

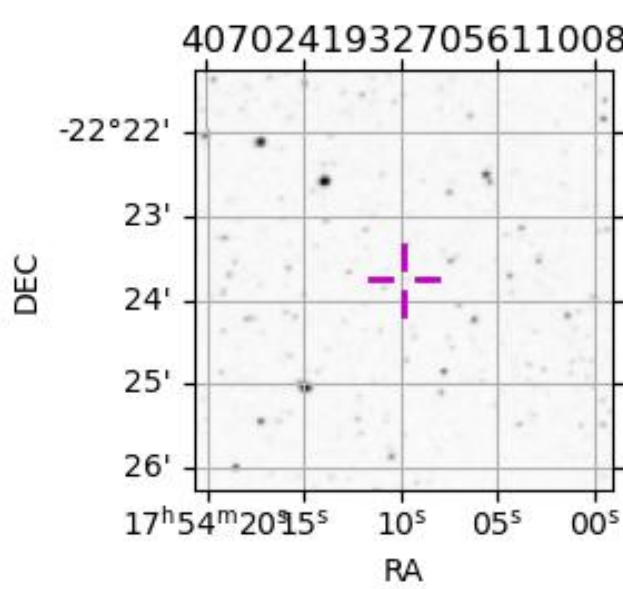
URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp

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

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUL 20 21:48 - JUL 20 21:53	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 20 21:49 - JUL 20 21:55	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUL 20 21:41 - JUL 20 21:45	Pie
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



2047-07-20T21:50:03.9900 α: 17 54 09.7131 δ: -22 23 45.550 C/A 0.711" PA 6.40 deg v_sky -14.62 km/s D 09.15 AU
 Credit: Styled after SORA/Lucky Star



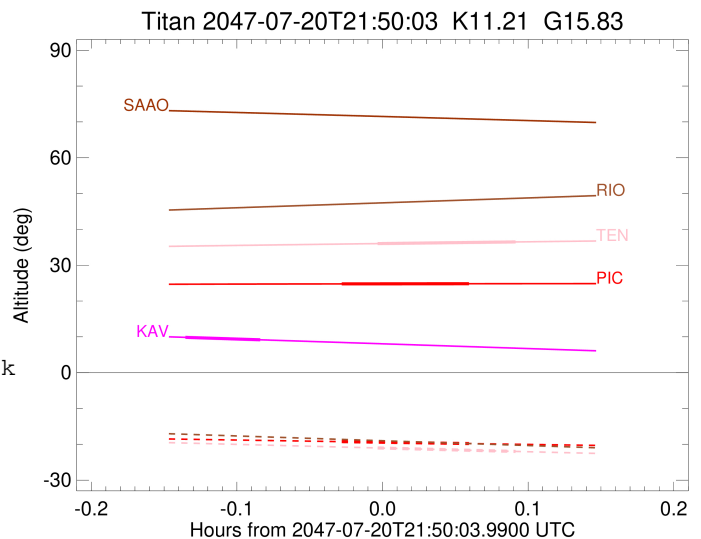
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-07-20T21:51:01.030
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : PIC
Location             : Pic du Midi
Latitude (deg)       : 42.93656
E. Longitude (deg)  : 0.14231
Altitude (km)        : 2.890
Gaia source ID       : 4070241932705611008
2Mass ID (if available) : 17540972-2223454
ICRS Star Coord at Epoch: 17h 54m 09.71306s -22:23:45.54951s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 11.206
G magnitude           : 15.825
RP magnitude         : 14.565
BP magnitude         : 17.276
DUPflag              : 0
Distance (au)        : 9.146
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.62
Sun-Target sep (deg) : 151.17
Sun-Moon sep (deg)  : 175.40
B (ring opening deg) : 26.61
PA of pole (deg)    : 5.55
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.151
C/A sky separation (km) : 998.5
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

```

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	2047-07-20T21:48:22.320	24.78	-19.25	2575.1	20.88	20.89
Titan	E	2047-07-20T21:53:39.780	24.83	-19.79	2575.1	19.68	19.69



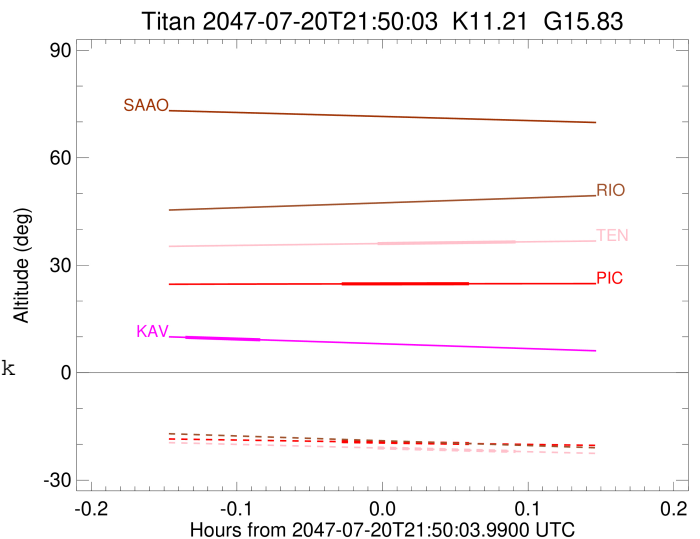
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-07-20T21:52:43.210
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        : 4070241932705611008
2Mass ID (if available) : 17540972-2223454
ICRS Star Coord at Epoch: 17h 54m 09.71306s -22:23:45.54951s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 11.206
G magnitude           : 15.825
RP magnitude          : 14.565
BP magnitude          : 17.276
DUPflag              : 0
Distance (au)         : 9.146
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.62
Sun-Target sep (deg) : 151.17
Sun-Moon sep (deg)   : 175.60
B (ring opening deg) : 26.61
PA of pole (deg)     : 5.55
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.021
C/A sky separation (km) : 140.0
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	2047-07-20T21:49:51.735	36.02	-21.01	2575.1	-2.34	-2.34
Titan	E	2047-07-20T21:55:34.722	36.49	-21.99	2575.1	-3.22	-3.22



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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-07-20T21:43:29.310
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : KAV
Location             : Kavalur Observatory
Latitude (deg)       : 12.57556
E. Longitude (deg)   : 78.83167
Altitude (km)        : 0.722
Gaia source ID       : 4070241932705611008
2Mass ID (if available) : 17540972-2223454
ICRS Star Coord at Epoch: 17h 54m 09.71306s -22:23:45.54951s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 11.206
G magnitude           : 15.825
RP magnitude         : 14.565
BP magnitude         : 17.276
DUPflag              : 0
Distance (au)        : 9.146
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.62
Sun-Target sep (deg) : 151.17
Sun-Moon sep (deg)   : 174.34
B (ring opening deg) : 26.61
PA of pole (deg)     : 5.55
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.327
C/A sky separation (km) : 2170.9
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

```

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	2047-07-20T21:41:55.558	9.86	-36.57	2575.1	-47.85	-47.87
Titan	E	2047-07-20T21:45:03.096	9.17	-35.97	2575.1	-49.96	-49.98

