

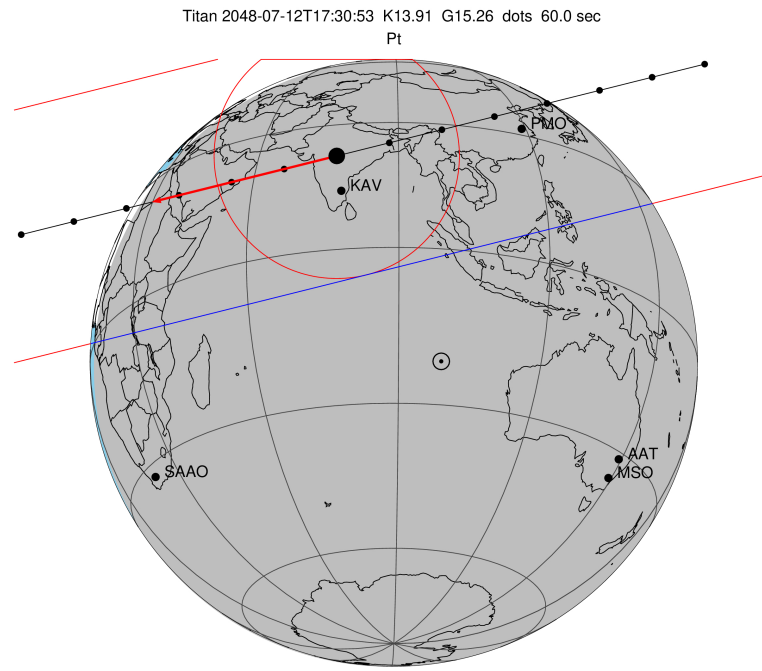
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2048-07-12T17:30:53.660  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4078676728707026688  
 2Mass ID (if available) : 18492211-2225010

ICRS Star Coord at Epoch: 18h 49m 22.08542s -22:25:01.54206s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 13.915  
 G magnitude : 15.260  
 RP magnitude : 14.754  
 BP magnitude : 15.580  
 DUPflag : 0  
 Distance (au) : 9.033  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -18.96  
 Sun-Target sep (deg) : 171.02  
 Sun-Moon sep (deg) : 153.43  
 B (ring opening deg) : 25.28  
 PA of pole (deg) : 6.47  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.685  
 C/A sky separation (km) : 4489.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

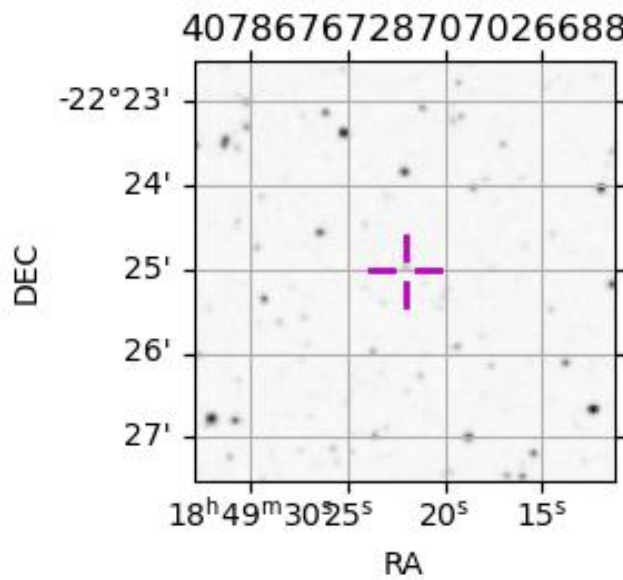
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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

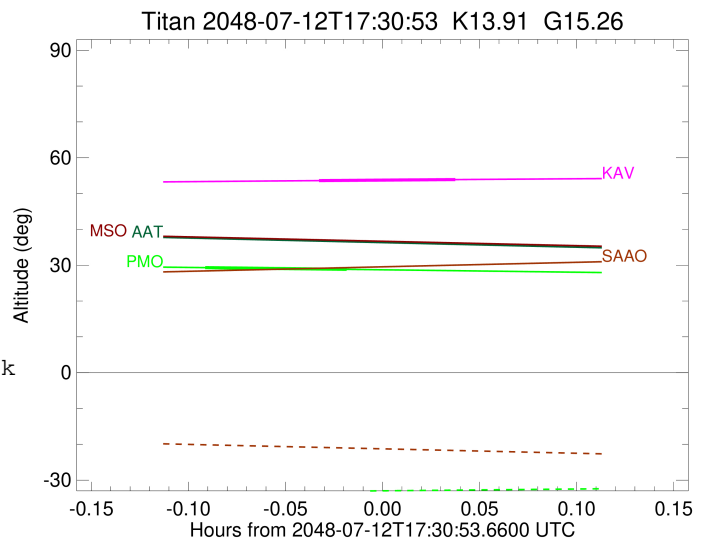
Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	JUL 12 17:25 - JUL 12 17:29	Pie
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUL 12 17:28 - JUL 12 17:33	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



2048-07-12T17:30:53.6600 cc: 18 49 22.0854 & -22 25 01.542 C/A 0.688" PA 345.98 deg v\_sky -18.96 km/s D 09.03 AU  
 Credit: Styled after SORA/Lucky Star



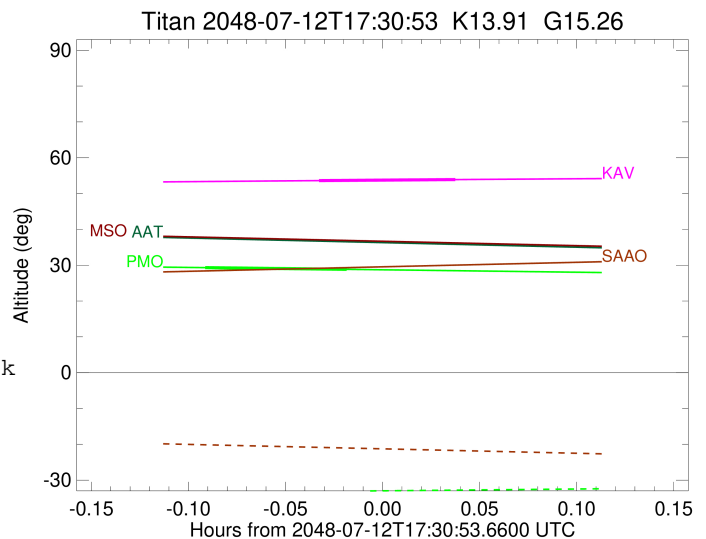
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2048-07-12T17:27:35.560  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Observer code : PMO  
 Location : Purple Mtn Obs. Nanking  
 Latitude (deg) : 32.06667  
 E. Longitude (deg) : 118.82089  
 Altitude (km) : 0.364  
 Gaia source ID : 4078676728707026688  
 2Mass ID (if available) : 18492211-2225010  
 ICRS Star Coord at Epoch: 18h 49m 22.08542s -22:25:01.54206s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 13.915  
 G magnitude : 15.260  
 RP magnitude : 14.754  
 BP magnitude : 15.580  
 DUPflag : 0  
 Distance (au) : 9.033  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -18.96  
 Sun-Target sep (deg) : 171.02  
 Sun-Moon sep (deg) : 153.16  
 B (ring opening deg) : 25.28  
 PA of pole (deg) : 6.47  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.057  
 C/A sky separation (km) : 375.0  
 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	2048-07-12T17:25:23.374	29.32	-33.40	2575.1	-25.47	-25.48
Titan	E	2048-07-12T17:29:47.738	28.84	-33.06	2575.1	10.52	10.53

target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2048-07-12T17:31:02.640  
 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 : 4078676728707026688  
 2Mass ID (if available) : 18492211-2225010  
 ICRS Star Coord at Epoch: 18h 49m 22.08542s -22:25:01.54206s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 13.915  
 G magnitude : 15.260  
 RP magnitude : 14.754  
 BP magnitude : 15.580  
 DUPflag : 0  
 Distance (au) : 9.033  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -18.96  
 Sun-Target sep (deg) : 171.02  
 Sun-Moon sep (deg) : 153.79  
 B (ring opening deg) : 25.28  
 PA of pole (deg) : 6.47  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.110  
 C/A sky separation (km) : 722.5  
 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	2048-07-12T17:28:55.245	53.61	-50.32	2575.1	-32.57	-32.59
Titan	E	2048-07-12T17:33:10.017	53.89	-50.83	2575.2	3.57	3.57