

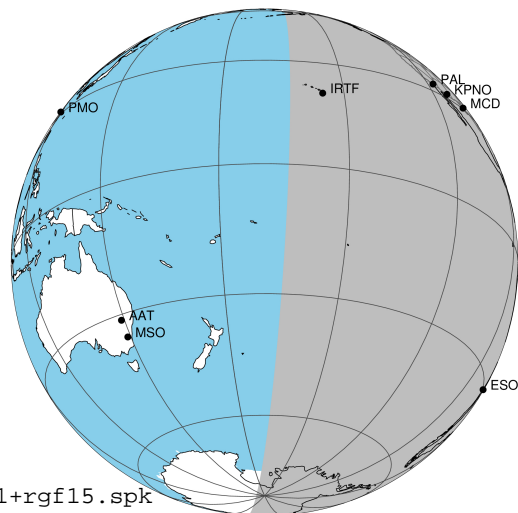
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-09-18T04:50:29.460  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4114313485470284672  
 2Mass ID (if available) : 17180144-2252454

Jupiter 2031-09-18T04:50:29 K9.91 G14.25 Pgt

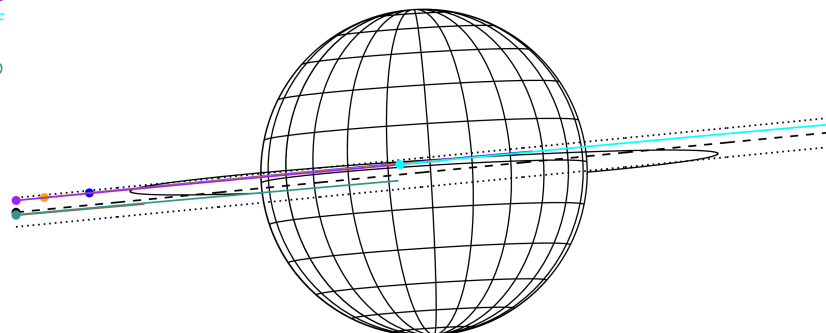
ICRS Star Coord at Epoch: 17h 18m 01.43282s -22:52:45.65632s

RUWE (>1.4 is poor) : 1.01  
 K magnitude : 9.913  
 G magnitude : 14.254  
 RP magnitude : 13.117  
 BP magnitude : 15.623  
 DUPflag : 0  
 Distance (au) : 5.227  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 15.29  
 Sun-Target sep (deg) : 85.68  
 Sun-Moon sep (deg) : 68.97  
 B (ring opening deg) : -2.37  
 PA of pole (deg) : 3.67  
 Pole direction: RA (deg): 268.05684  
 Dec (deg): 64.49652  
 C/A sky separation (") : 0.030  
 C/A sky separation (km) : 112.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-09-18T04:50:29 K9.91 G14.25  
 Pgt



Earth  
 PAL  
 KPNO  
 MCD  
 IRTF  
 RIO  
 ESO

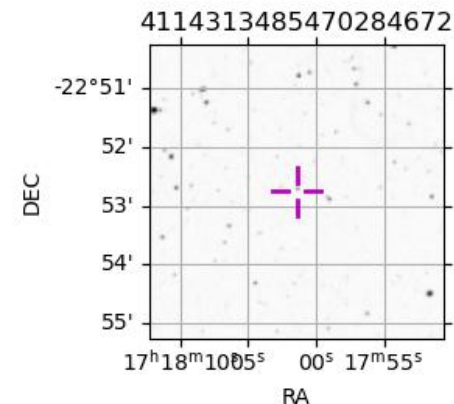


2031-09-18T04:50:29.4600 cc: 17 18 01.4328 s: -22 52 45.656 C/A 0.020" PA 185.56 deg v\_sky +15.29 km/s D 05.23 AU

Credit: Styled after SORA/Lucky Star

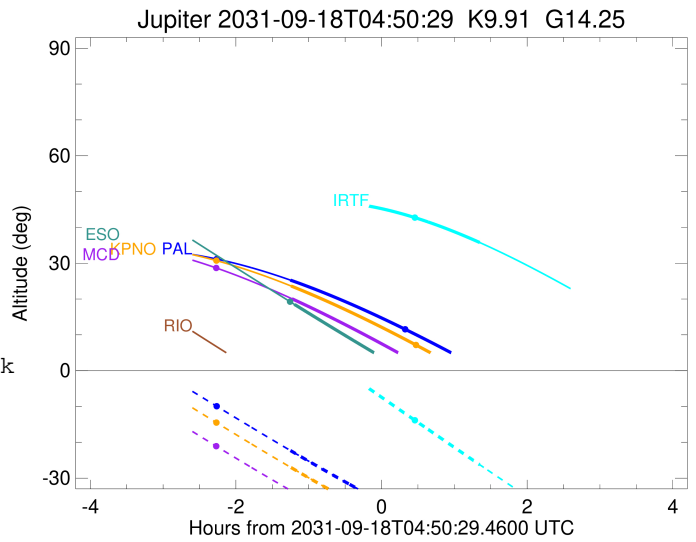
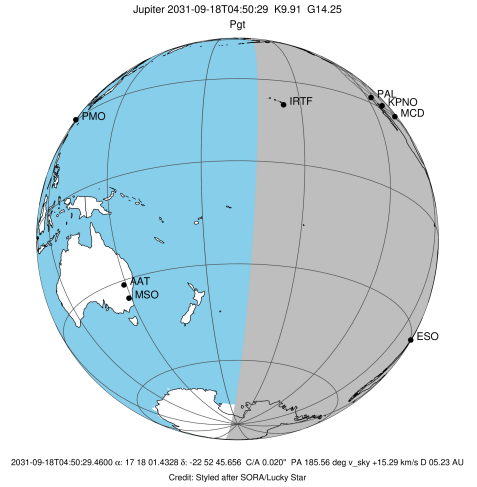
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+	SEP 18 03:35 - SEP 18 03:35	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	SEP 18 03:35 - SEP 18 03:35	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	SEP 18 03:36 - SEP 18 03:36	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	SEP 18 06:11 - SEP 18 06:11	Pne
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	+	SEP 18 03:38 - SEP 18 03:38	Pin
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



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-18T04:54:44.320
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: 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        : 4114313485470284672
2Mass ID (if available) : 17180144-2252454
ICRS Star Coord at Epoch: 17h 18m 01.43282s -22:52:45.65632s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.913
G magnitude           : 14.254
RP magnitude          : 13.117
BP magnitude          : 15.623
DUPflag              : 0
Distance (au)         : 5.227
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 15.29
Sun-Target sep (deg)  : 85.68
Sun-Moon sep (deg)   : 69.41
B (ring opening deg) : -2.37
PA of pole (deg)     : 3.67
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (" ) : 1.303
C/A sky separation (km) : 4939.2
NAIF SPICE kernels   : RAJobs_U111+rgf15.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
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

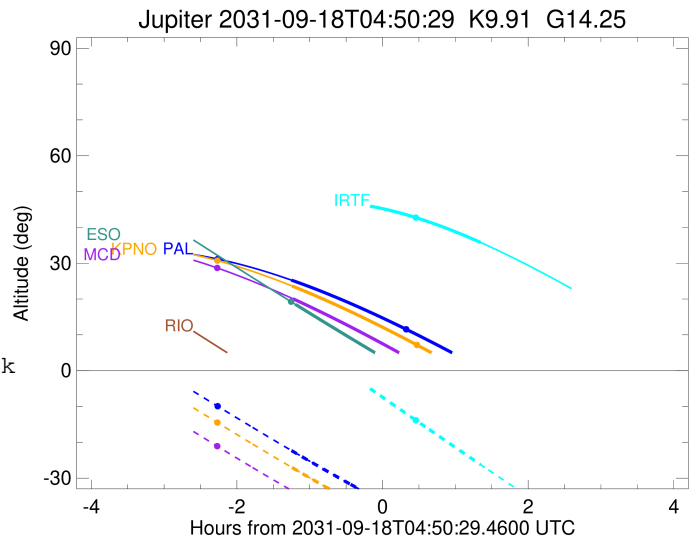
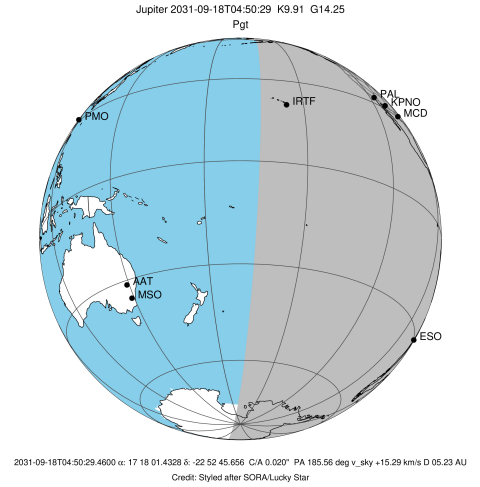


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-18T03:35:26.281	25.27	-22.29	71492.0	2.33	2.66
Jupiter	E	2031-09-18T06:13:20.805	0.37x	-49.17	71491.9	5.43	6.21

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-18T04:55:08.760
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: 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        : 4114313485470284672
2Mass ID (if available) : 17180144-2252454
ICRS Star Coord at Epoch: 17h 18m 01.43282s -22:52:45.65632s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.913
G magnitude           : 14.254
RP magnitude          : 13.117
BP magnitude          : 15.623
DUPflag              : 0
Distance (au)         : 5.227
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 15.29
Sun-Target sep (deg)  : 85.68
Sun-Moon sep (deg)    : 69.39
B (ring opening deg) : -2.37
PA of pole (deg)      : 3.67
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (") : 1.242
C/A sky separation (km) : 4708.3
NAIF SPICE kernels    : RAJobs_U111+rgf15.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
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
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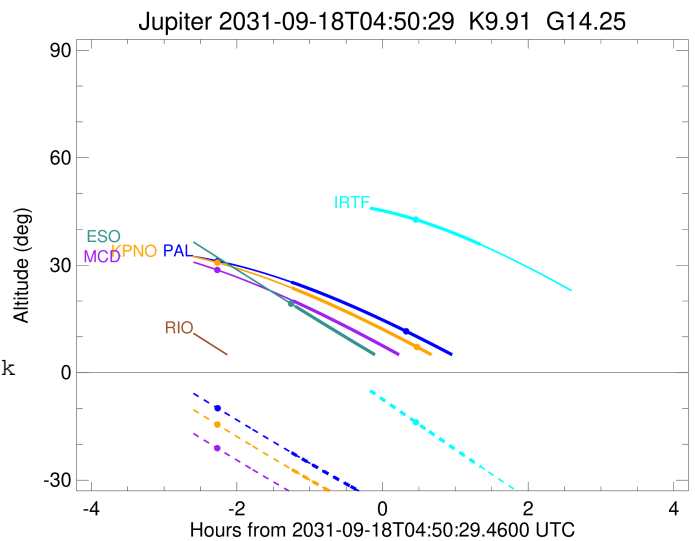
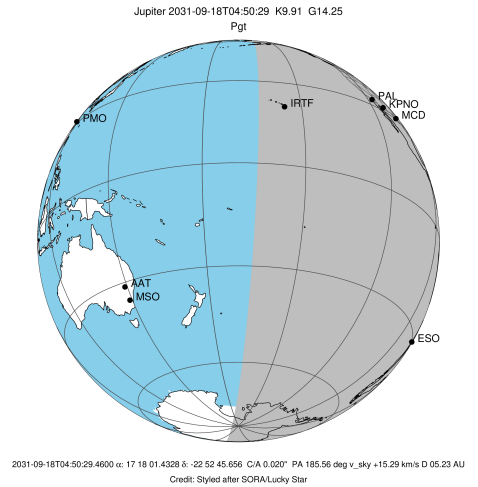


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-18T03:35:56.513	23.64	-27.04	71492.0	2.19	2.51
Jupiter	E	2031-09-18T06:13:36.808	-3.03x	-52.72	71491.9	5.21	5.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-18T04:55:37.040
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: 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        : 4114313485470284672
2Mass ID (if available) : 17180144-2252454
ICRS Star Coord at Epoch: 17h 18m 01.43282s -22:52:45.65632s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.913
G magnitude           : 14.254
RP magnitude          : 13.117
BP magnitude          : 15.623
DUPflag              : 0
Distance (au)         : 5.227
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 15.29
Sun-Target sep (deg)  : 85.68
Sun-Moon sep (deg)    : 69.34
B (ring opening deg) : -2.37
PA of pole (deg)      : 3.67
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (") : 1.159
C/A sky separation (km) : 4393.9
NAIF SPICE kernels   : RAJobs_U111+rgf15.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
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
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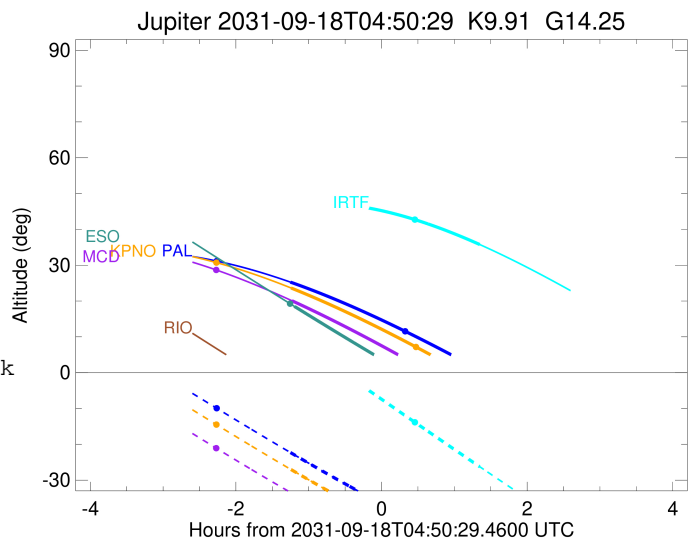
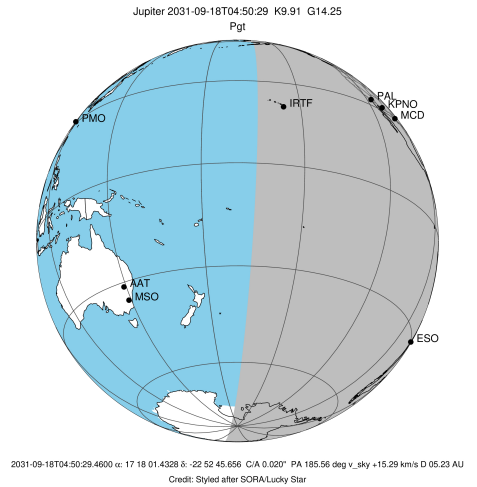


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-18T03:36:35.584	20.09	-33.62	71492.0	2.01	2.29
Jupiter	E	2031-09-18T06:13:51.392	-8.52x	-56.43	71491.9	4.91	5.61

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-18T04:51:40.470
Event type            : Pgt
: Jupiter 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        : 4114313485470284672
2Mass ID (if available) : 17180144-2252454
ICRS Star Coord at Epoch: 17h 18m 01.43282s -22:52:45.65632s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.913
G magnitude           : 14.254
RP magnitude          : 13.117
BP magnitude          : 15.623
DUPflag              : 0
Distance (au)         : 5.227
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 15.29
Sun-Target sep (deg)  : 85.68
Sun-Moon sep (deg)   : 69.67
B (ring opening deg) : -2.37
PA of pole (deg)     : 3.67
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (") : 1.182
C/A sky separation (km) : 4480.7
NAIF SPICE kernels   : RAJobs_U111+rgf15.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
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

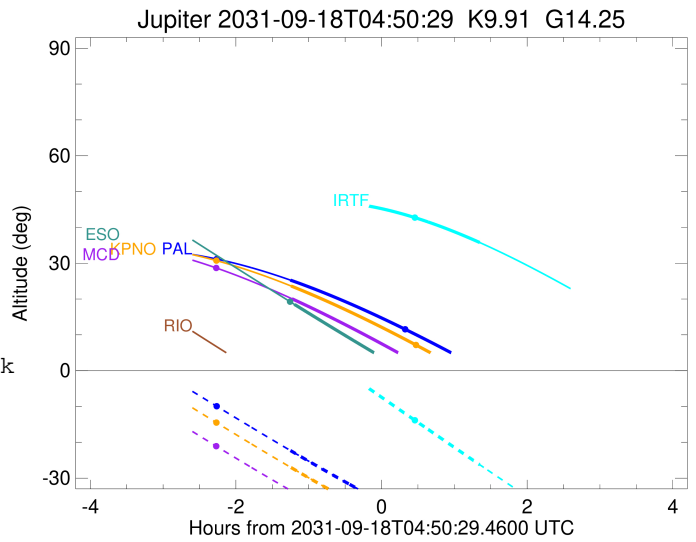
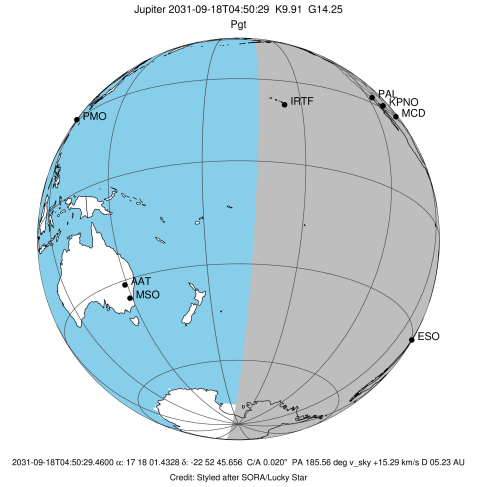


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-18T03:31:33.034	47.03	11.17x	71492.0	1.55	1.78
Jupiter	E	2031-09-18T06:11:28.513	35.76	-26.26	71491.9	5.39	6.16

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-18T04:56:44.400
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : ESO
Location              : European Southern Obs. (3.6m)
Latitude (deg)       : -29.26097
E. Longitude (deg)   : 289.26831
Altitude (km)        : 2.400
Gaia source ID       : 4114313485470284672
2Mass ID (if available) : 17180144-2252454
ICRS Star Coord at Epoch: 17h 18m 01.43282s -22:52:45.65632s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.913
G magnitude           : 14.254
RP magnitude         : 13.117
BP magnitude         : 15.623
DUPflag              : 0
Distance (au)        : 5.227
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 15.29
Sun-Target sep (deg) : 85.68
Sun-Moon sep (deg)   : 69.31
B (ring opening deg) : -2.37
PA of pole (deg)     : 3.67
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (") : 0.687
C/A sky separation (km) : 2603.4
NAIF SPICE kernels   : RAJobs_U111+rgf15.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
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
Jupiter	I	2031-09-18T03:38:45.720	18.49	-59.51	71492.0	-3.42	-3.91
Jupiter	E	2031-09-18T06:13:54.081	-12.12x	-54.40	71492.0	-0.76	-0.86