

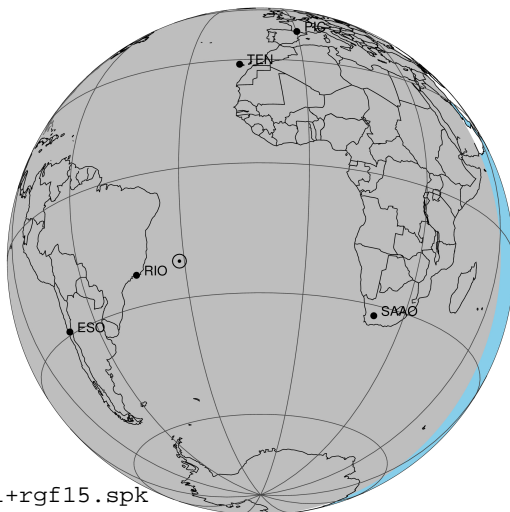
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-05-29T02:02:21.790  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116925134909484288  
 2Mass ID (if available) : 17414393-2252458

Jupiter 2031-05-29T02:02:21 K8.46 G14.75 Pgt

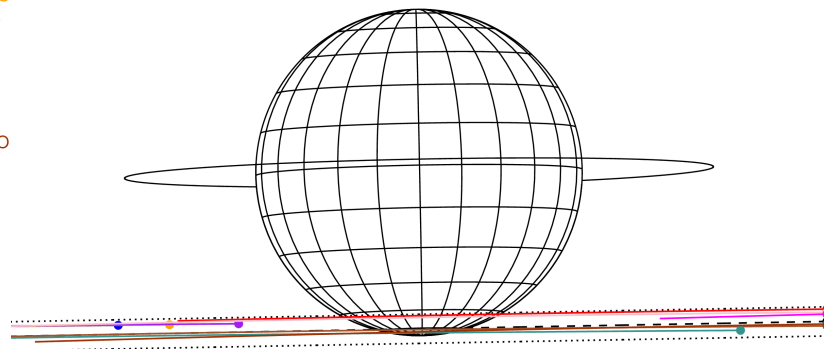
ICRS Star Coord at Epoch: 17h 41m 43.92234s -22:52:46.21838s

RUWE (>1.4 is poor) : 0.97  
 K magnitude : 8.459  
 G magnitude : 14.754  
 RP magnitude : 13.214  
 BP magnitude : 17.962  
 DUPflag : 0  
 Distance (au) : 4.316  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.90  
 Sun-Target sep (deg) : 161.32  
 Sun-Moon sep (deg) : 113.04  
 B (ring opening deg) : -2.60  
 PA of pole (deg) : 1.13  
 Pole direction: RA (deg): 268.05693  
 Dec (deg): 64.49651  
 C/A sky separation (") : 21.875  
 C/A sky separation (km) : 68478.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-05-29T02:02:21 K8.46 G14.75  
 Pgt



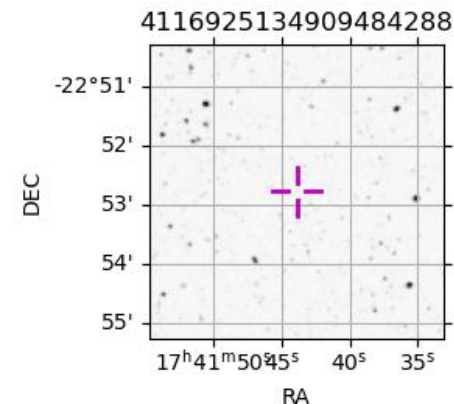
Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 KAV  
 RIO  
 ESO  
 SAAO



2031-05-29T02:02:21.7900 α: 17 41 43.9223 s δ: -22 52 46.218 C/A \*\*\*\*\* PA 1.04 deg v\_sky -14.90 km/s D 04.32 AU  
 Credit: Styled after SORA/Lucky Star

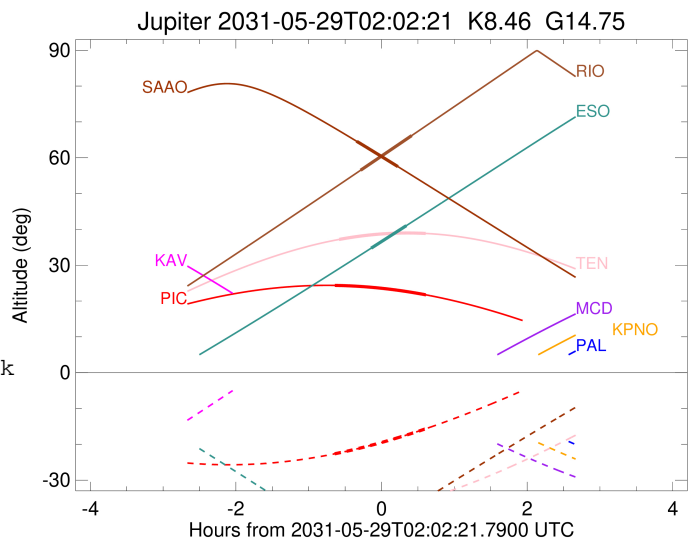
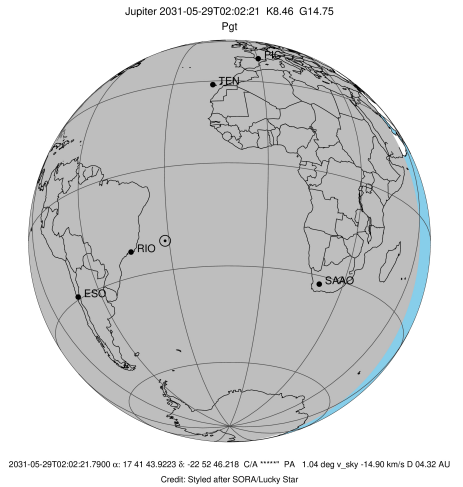
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	MAY 29 01:23 - MAY 29 02:38	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	+ +	MAY 29 01:27 - MAY 29 02:38	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 29 01:45 - MAY 29 02:27	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	MAY 29 01:53 - MAY 29 02:22	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 29 01:41 - MAY 29 02:15	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-29T02:01:22.070
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: 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        : 4116925134909484288
2Mass ID (if available) : 17414393-2252458
ICRS Star Coord at Epoch: 17h 41m 43.92234s -22:52:46.21838s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 8.459
G magnitude           : 14.754
RP magnitude          : 13.214
BP magnitude          : 17.962
DUPflag              : 0
Distance (au)         : 4.316
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.90
Sun-Target sep (deg)  : 161.32
Sun-Moon sep (deg)    : 113.30
B (ring opening deg) : -2.60
PA of pole (deg)      : 1.13
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 20.027
C/A sky separation (km) : 62695.8
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
    
```

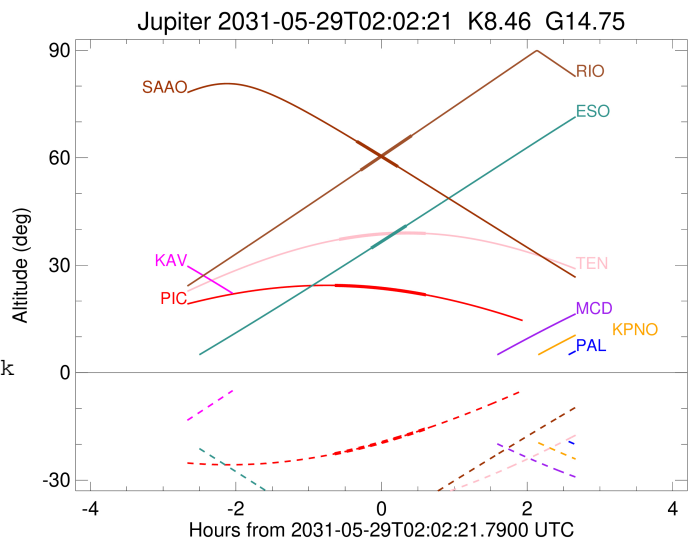
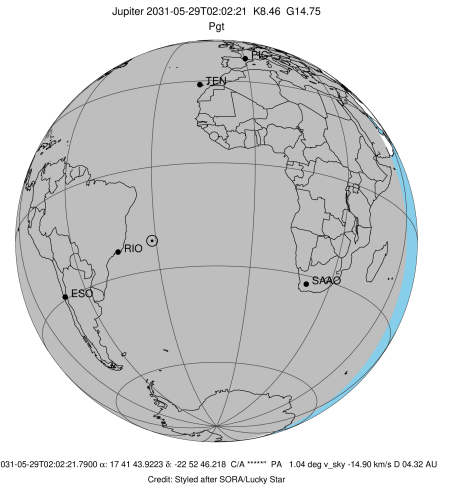


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-29T01:23:51.166	24.35	-22.64	71484.9	-61.23	-64.21
Jupiter	E	2031-05-29T02:38:53.951	21.73	-15.64	71484.9	-61.21	-64.19

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-29T02:03:06.730
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: 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       : 4116925134909484288
2Mass ID (if available) : 17414393-2252458
ICRS Star Coord at Epoch: 17h 41m 43.92234s -22:52:46.21838s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 8.459
G magnitude           : 14.754
RP magnitude         : 13.214
BP magnitude         : 17.962
DUPflag             : 0
Distance (au)        : 4.316
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.90
Sun-Target sep (deg) : 161.32
Sun-Moon sep (deg)  : 113.58
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.13
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 20.297
C/A sky separation (km): 63539.5
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
    
```

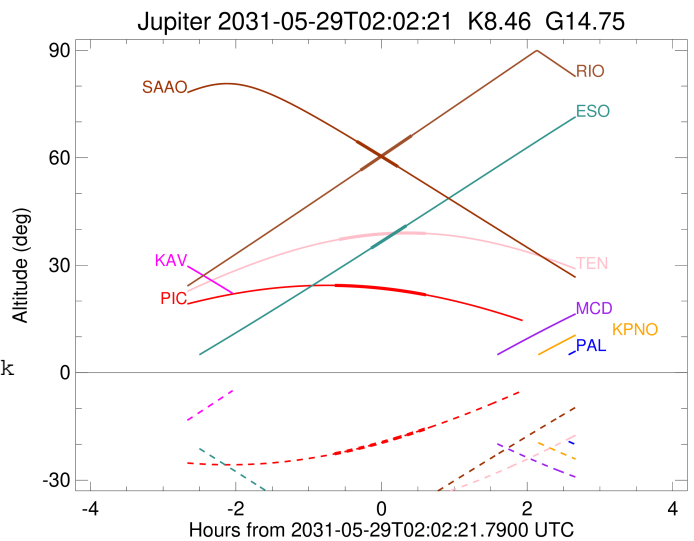
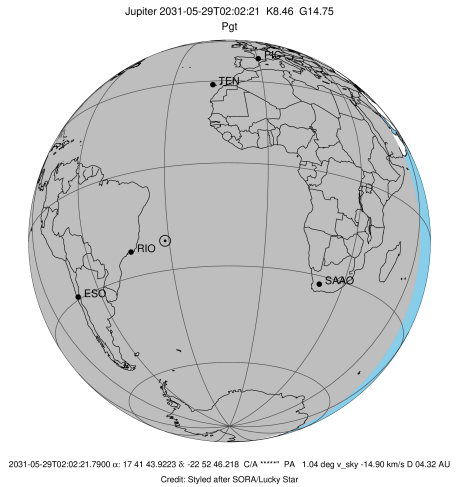


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-29T01:27:29.510	37.19	-39.97	71484.6	-62.82	-65.68
Jupiter	E	2031-05-29T02:38:42.515	38.86	-35.23	71484.7	-62.50	-65.38

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-29T02:06:13.350
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : RIO
Location              : Rio de Janeiro
Latitude (deg)        : -22.89506
E. Longitude (deg)    : 316.77708
Altitude (km)         : 0.033
Gaia source ID        : 4116925134909484288
2Mass ID (if available) : 17414393-2252458
ICRS Star Coord at Epoch: 17h 41m 43.92234s -22:52:46.21838s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 8.459
G magnitude           : 14.754
RP magnitude          : 13.214
BP magnitude          : 17.962
DUPflag              : 0
Distance (au)         : 4.316
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.90
Sun-Target sep (deg)  : 161.32
Sun-Moon sep (deg)    : 113.96
B (ring opening deg) : -2.60
PA of pole (deg)      : 1.13
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 21.990
C/A sky separation (km) : 68840.1
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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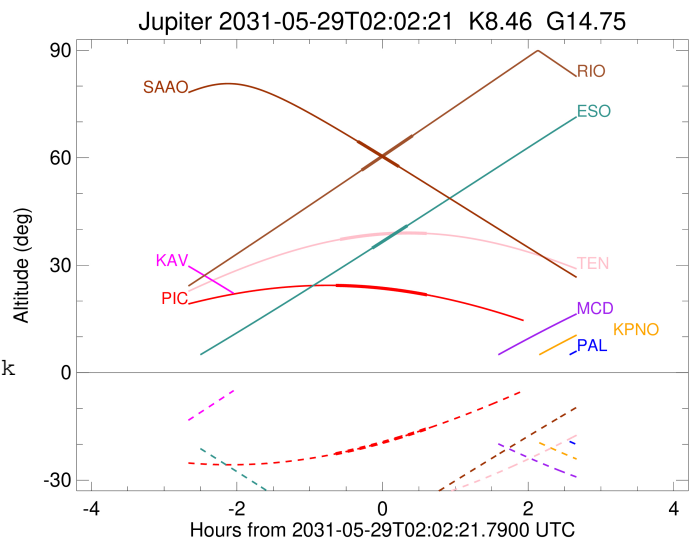
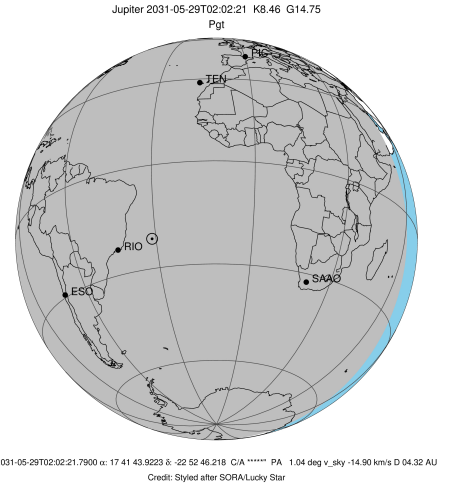


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-29T01:45:12.706	56.51	-74.90	71483.4	-74.61	-76.36
Jupiter	E	2031-05-29T02:27:12.073	66.16	-84.53	71483.4	-73.76	-75.60

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-29T02:08:20.450
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       : 4116925134909484288
2Mass ID (if available) : 17414393-2252458
ICRS Star Coord at Epoch: 17h 41m 43.92234s -22:52:46.21838s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 8.459
G magnitude          : 14.754
RP magnitude         : 13.214
BP magnitude         : 17.962
DUPflag             : 0
Distance (au)        : 4.316
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.90
Sun-Target sep (deg) : 161.32
Sun-Moon sep (deg)   : 113.83
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.13
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 22.445
C/A sky separation (km): 70264.0
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
    
```

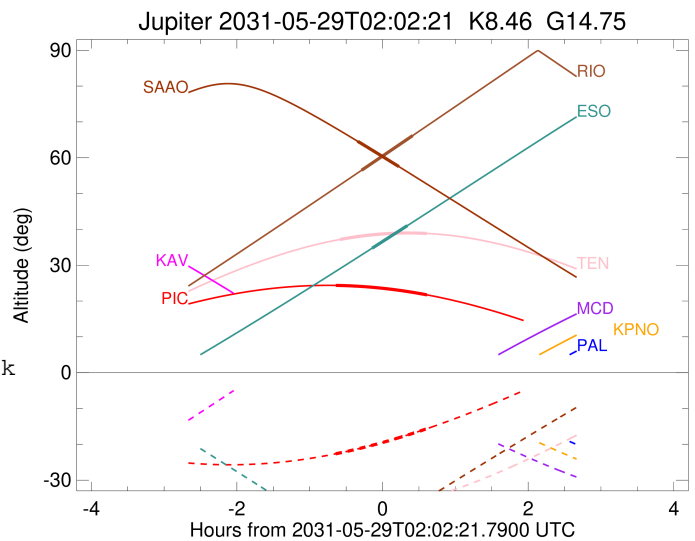
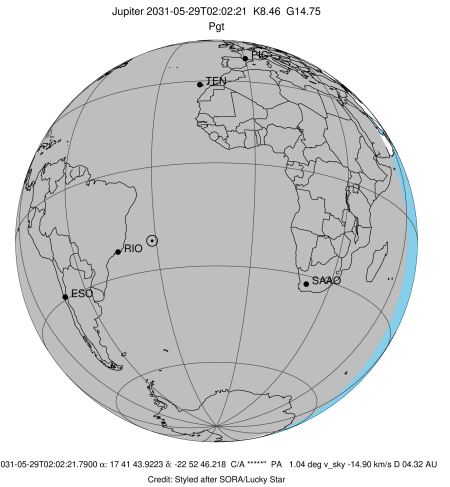


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-29T01:53:50.794	34.74	-51.84	71483.0	-79.69	-80.89
Jupiter	E	2031-05-29T02:22:48.736	41.04	-58.16	71483.1	-78.51	-79.84

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-29T01:58:51.220
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : SAAO
Location             : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)       : -32.37953
E. Longitude (deg)   : 20.81070
Altitude (km)        : 1.768
Gaia source ID       : 4116925134909484288
2Mass ID (if available) : 17414393-2252458
ICRS Star Coord at Epoch: 17h 41m 43.92234s -22:52:46.21838s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 8.459
G magnitude          : 14.754
RP magnitude         : 13.214
BP magnitude         : 17.962
DUPflag             : 0
Distance (au)        : 4.316
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.90
Sun-Target sep (deg) : 161.32
Sun-Moon sep (deg)   : 113.61
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.13
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 22.287
C/A sky separation (km) : 69769.9
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
    
```



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	2031-05-29T01:41:52.247	64.59	-47.16	71483.2	-77.00	-78.50
Jupiter	E	2031-05-29T02:15:51.086	57.51	-39.97	71483.2	-77.37	-78.83