16069 - TCP J21040470+4631129 - a highly evolved cataclysmic variable unmasked?

Cycle: 27, Proposal Category: GO

(UV Initiative)

(Availability Mode: AVAILABLE)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) TCP-J21040470+4631129	COS/FUV	4	30-Oct-2020 16:00:15.0	yes
02	(1) TCP-J21040470+4631129	S/C	1	30-Oct-2020 16:00:17.0	yes
03	(2) TARGET01-SAFE-TARGET	COS/FUV	4	30-Oct-2020 16:00:18.0	yes
04	(1) TCP-J21040470+4631129	COS/FUV	4	30-Oct-2020 16:00:21.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
05	(1) TCP-J21040470+4631129	S/C	1	30-Oct-2020 16:00:21.0	yes
06	(3) TARGET01-SAFE-TARGET-HOPR	COS/FUV	4	30-Oct-2020 16:00:23.0	yes

18 Total Orbits Used

ABSTRACT

The cataclysmic variable TCP J21040470+4631129 has been laying dormant in our backyard until July 12th, 2019, when it brightened from V=17.8 to V=8.4 in a matter of days, undergoing its first recorded dwarf nova outburst. TCP J2104+4631 is literally in our backyard: The accurate Gaia parallax places the system at 109.2+-1.5 pc, making it one of the closest of > 5000 known CVs. How did it manage to remain hidden to the intense scrutiny of the northern hemisphere by both the vast array of time-domain surveys and countless amateur observers? The only valid explanation is that its outburst recurrence time is extremely long, implying an exceptionally low mass loss rate of the donor, and that in turn suggests that this system may be an example of the predicted, but so far missing population of highly evolved and inconspicuous interacting binaries.

We propose to obtain COS far-ultraviolet spectroscopy of TCP J2104+4631 spanning the full binary orbit to determine the masses of both stellar components, the chemical composition of the donor star, and to measure the effective temperature of the white dwarf as it emerges from the recent accretion eposide. Using these quantities, we will establish the evolutionary state of the system. Confirming that TCP J2104+4631 is one of the long sought-after highly evolved CVs that are predicted to dominate the Galactic population of these interacting binaries would provide strong support that these systems are effectively hiding from our view, alleviating the stark contrast between current theoretical and observational population studies.

OBSERVING DESCRIPTION

The goal of these observations is to obtain high signal-to-noise far-ultraviolet spectra of the white dwarf in the dwarf nova TCPJ21040470+4631129, which was heated during a recent dwarf nova outburst. The planned COS spectroscopy will be used to measure the effictive temperature, and the abundances of the accreted material from the sharp photospheric metal lines.

We use the G130M grating with two central wavelengths to maximise the wavelength covered by these observations, and to achieve gap-less coverage. We make use of all permitted FP-POS positions, i.e. 3 & 4 for @1291A, and 1,2,3,4 @ 1222A. The @1291A and @1222A observations are split into two separate visits to facilitate the scheduling.

We use a dispersed light target acquisition, and for the ETC simulations we adopted a white dwarf temperature of 25000K. Scaled to the (Gaia-based) distance of 109pc, this corresponds to a flux of 1e-13erg/cm2/s/AA @ 1300A.
This program should not be affected in case that HST moves to a 2-gyro mode.

Visit

Proposal 16069, COS spectroscopy, G130M @ 1291, 1222A (01), failed Fri Oct 30 20:00:24 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: ORIENT 10D TO 255 D

Comments: Only two FP-POS settings allowed for the 1291A central wavelength.

This should be scheduled in evening-local time. Flags need to be cleared during the work day.

Diagnostics

(COS spectroscopy, G130M @ 1291, 1222A (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(COS spectroscopy, G130M @ 1291, 1222A (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(COS spectroscopy, G130M @ 1291, 1222A (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(COS spectroscopy, G130M @ 1291, 1222A (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

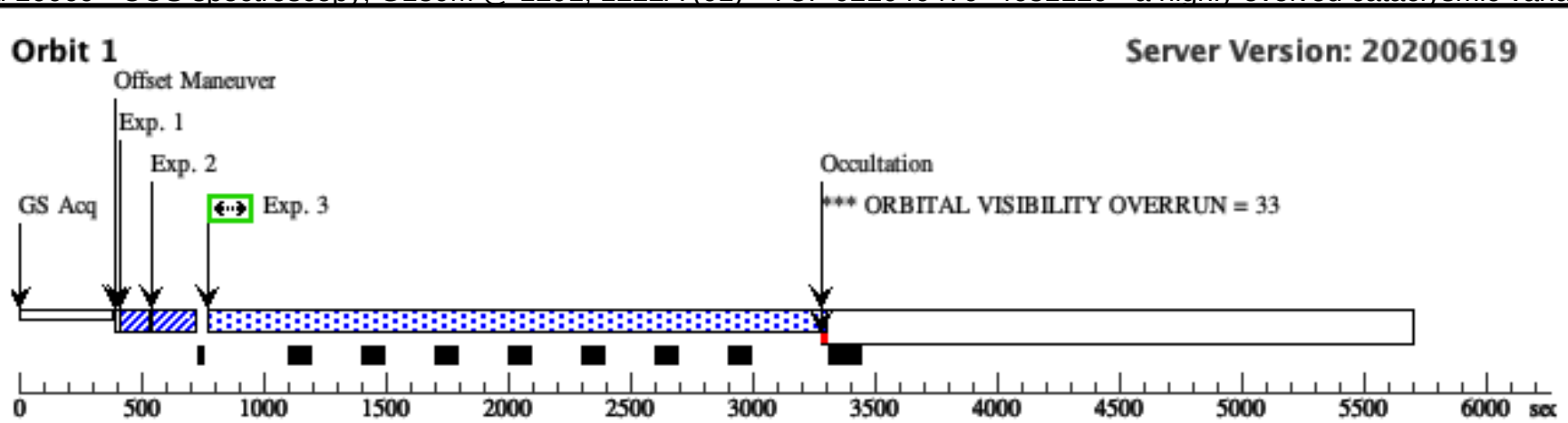
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	TCP-J21040470+4631129	RA: 21 04 4.6877 (316.0195321d) Dec: +46 31 13.75 (46.52049d) Equinox: J2000	Proper Motion RA: 6.229 mas/yr Proper Motion Dec: -46.319 mas/yr Epoch of Position: 2015.5	V=15 Swift UVW1=13.0	Reference Frame: ICRS

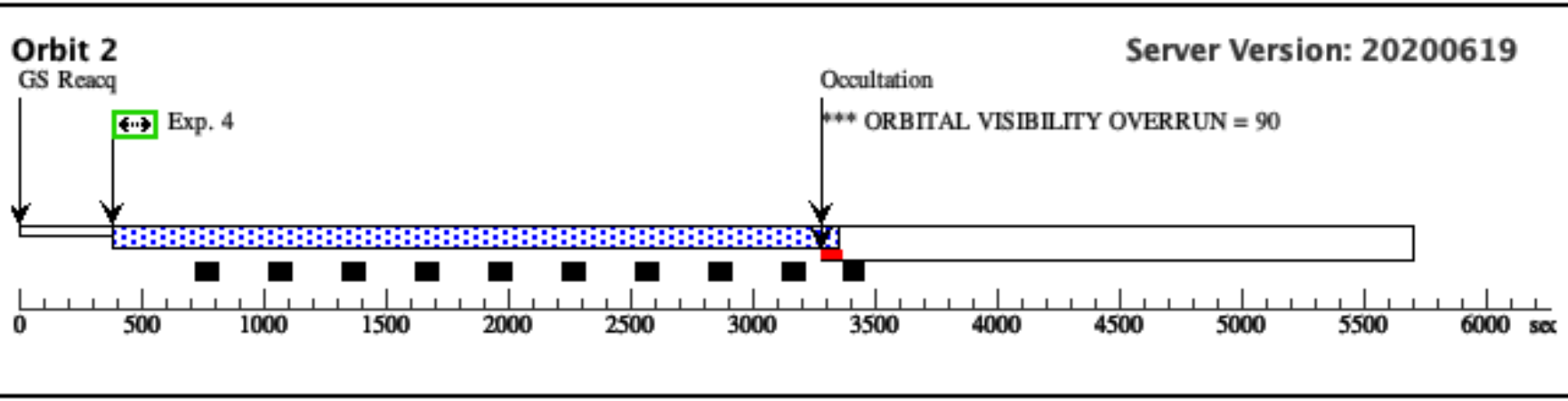
Comments:
Category=STAR
Description=[DWARF NOVA]
Extended=NO

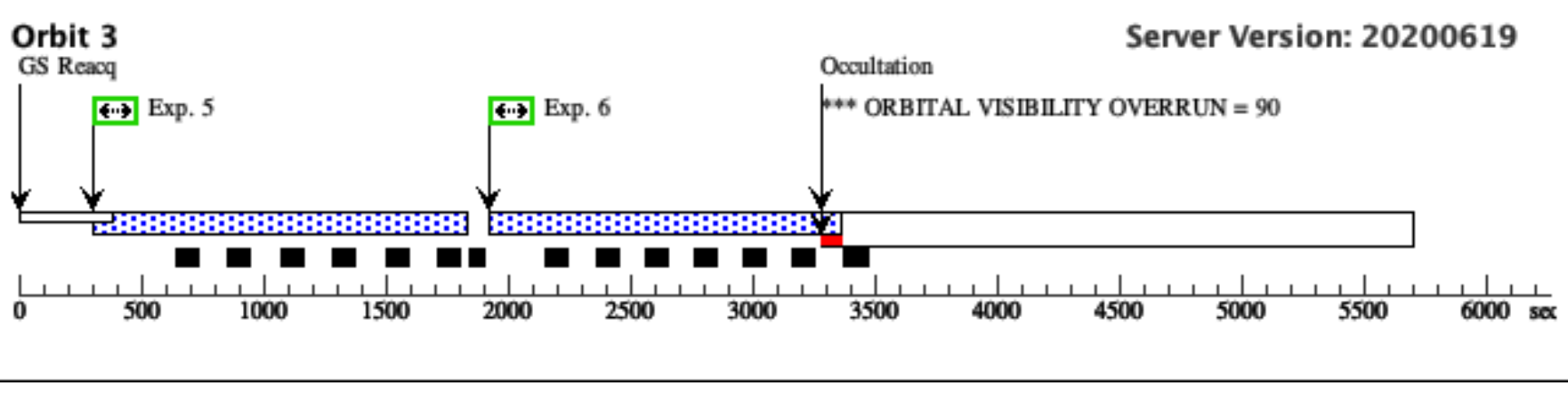
Exposures

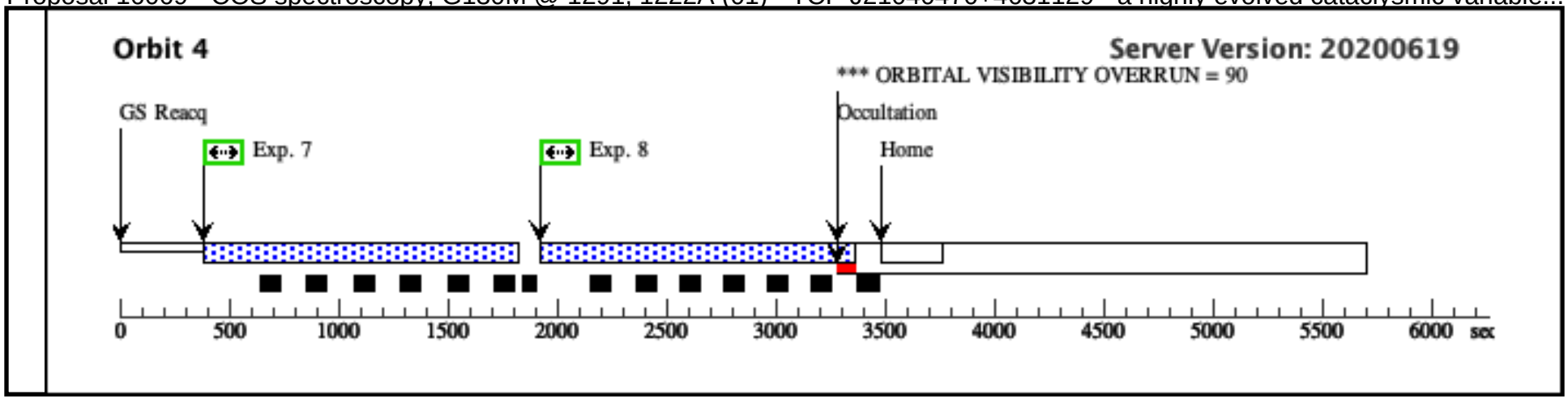
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/PEAKXD (COS.sa.1432641)	(1) TCP-J21040470+4631129	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	LIFETIME-POS=LP4	USE OFFSET V01SAF		5 Secs (5 Secs) *[==>]*	***[1]***
	Comments: We have good orbital phase coverage with Swift UVW1 (2600A) and SDSS u (3650A), amplitude and flux in the two bands are identical, so we adopt a flat spectrum in Flambda. At orbital minimum, the flux in Swift UVW1 is 2e-15 erg/cm2/s/AA, and we set up the target acquisition to achieve a S/N of 40 at that faintest phase. At orbital maximum, the system reaches 1.2e-14 erg/cm2/s/AA. This is a factor ~30 below the COS bright limit for the chosen setup.								
2	ACQ/PEAKD (COS.sa.1432641)	(1) TCP-J21040470+4631129	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=0.9; CENTER=DEF; NUM-POS=5; LIFETIME-POS=LP4	USE OFFSET V01SAF		5 Secs (5 Secs) *[==>]*	***[1]***
3	G130M @ 1291A, FP-POS=3 (COS.sp.1432643)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=300; FP-POS=3; LIFETIME-POS=LP4	USE OFFSET V01SAF		2480 Secs (2480 Secs) *[==>]*	***[1]***
4	G130M @ 1291A, FP-POS=4 (COS.sp.1432643)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=300; FP-POS=4; LIFETIME-POS=LP4	USE OFFSET V01SAF		2919 Secs (2919 Secs) *[==>]*	***[2]***
5	G130M @ 1222A, FP-POS=1 (COS.sp.1432817)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=215; FP-POS=1; LIFETIME-POS=LP4	USE OFFSET V01SAF		1390 Secs (1390 Secs) *[==>]*	***[3]***
6	G130M @ 1222A, FP-POS=2 (COS.sp.1432817)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=200; FP-POS=2; LIFETIME-POS=LP4	USE OFFSET V01SAF		1386 Secs (1386 Secs) *[==>]*	***[3]***
7	G130M @ 1222A, FP-POS=3 (COS.sp.1432817)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=215; FP-POS=3; LIFETIME-POS=LP4	USE OFFSET V01SAF		1390 Secs (1390 Secs) *[==>]*	***[4]***
8	G130M @ 1222A, FP-POS=4 (COS.sp.1432817)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=200; FP-POS=4; LIFETIME-POS=LP4	USE OFFSET V01SAF		1386 Secs (1386 Secs) *[==>]*	***[4]***

Orbit Structure





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Visit

Proposal 16069, S/C Visit (02), completed Fri Oct 30 20:00:24 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: S/C

Special Requirements: ORIENT 10D TO 255 D

Comments: This visit allocates and sets up the safeposition offset slot for science visit 01 which will use that slot. This S/C visit should go earlier in the week while science visit 01 will be at least 3 days later. Note: weekends are to be avoided since the CS must clear the target within 24 hours of HST execution.

Fixed Targets

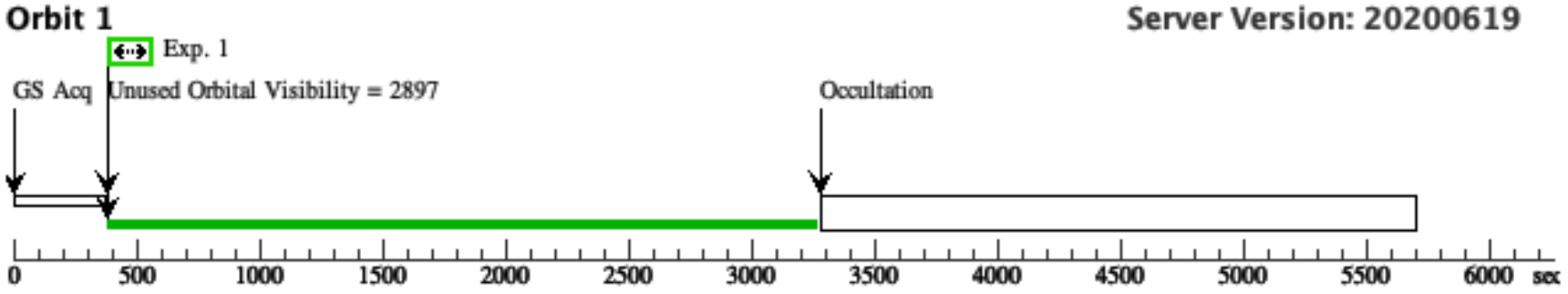
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	TCP-J21040470+4631129	RA: 21 04 4.6877 (316.0195321d) Dec: +46 31 13.75 (46.52049d) Equinox: J2000	Proper Motion RA: 6.229 mas/yr Proper Motion Dec: -46.319 mas/yr Epoch of Position: 2015.5	V=15 Swift UVW1=13.0	Reference Frame: ICRS

Comments:
Category=STAR
Description=[DWARF NOVA]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) TCP-J21040470+4631129	S/C, DATA, V1			POS TARG 229.13,-241.06; SAVE OFFSET V01 SAF; SPEC COM INSTR ECSLOTSET; QESIPARM ANGLE 172.8; QESIPARM DIST 9.845		5 Secs (5 Secs) *[==>]*	*[1]*

Orbit Structure



Visit

Proposal 16069, BOP Visit (03), withdrawn Fri Oct 30 20:00:24 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: ORIENT 10D TO 255 D

Comments: This visit is for BOP checking the safetarget only and should not execute onboard HST.

Diagnostics

(BOP Visit (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(BOP Visit (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(BOP Visit (03)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

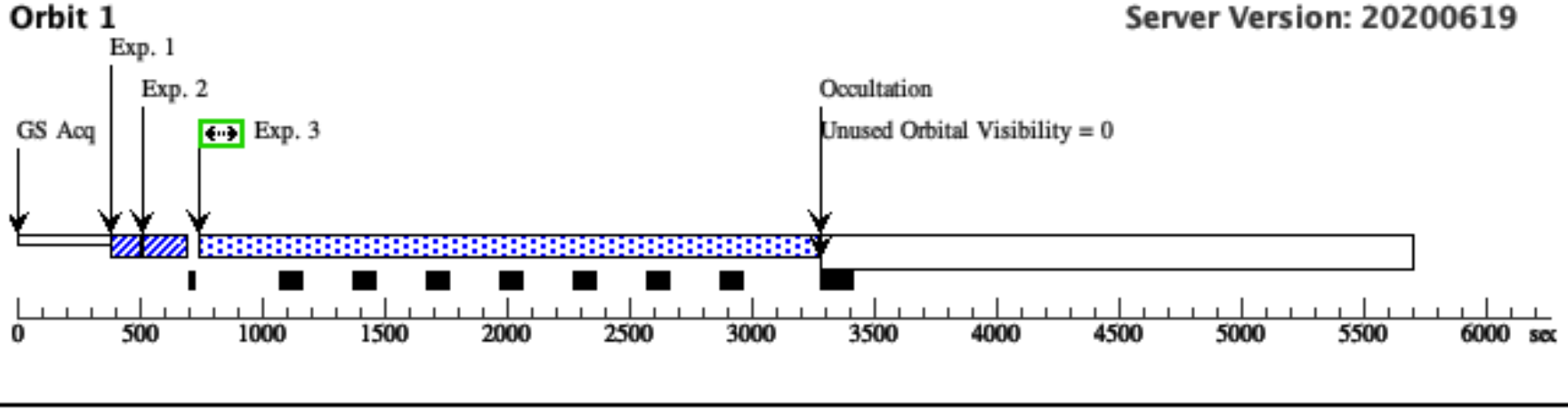
Fixed Targets

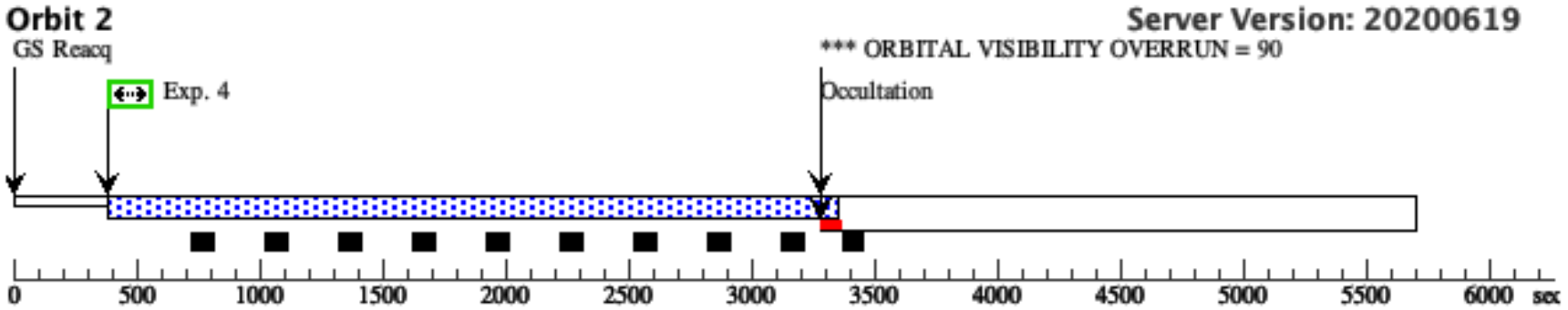
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	TCP-J21040470+4631129	RA: 21 04 4.6877 (316.0195321d) Dec: +46 31 13.75 (46.52049d) Equinox: J2000	Proper Motion RA: 6.229 mas/yr Proper Motion Dec: -46.319 mas/yr Epoch of Position: 2015.5	V=15 Swift UVW1=13.0	Reference Frame: ICRS
Comments: *Category=STAR* *Description=[DWARF NOVA]* *Extended=NO*					
(2)	TARGET01-SAFE-TARGET	Offset from TCP-J21040470+4631129 RA Offset: 0.11 Secs Dec Offset: -9.767 Arcsec		V=15	Offset Position (TARGET01-SAFE-TARGET)
Comments: This target is a blank piece of sky which is the bright object safe pointing and is 9.845 arcseconds away at a PA 172.8 degrees from TCP-J21040470+4631129. *Category=UNIDENTIFIED* *Description=[BLANK FIELD]* *Extended=NO*					

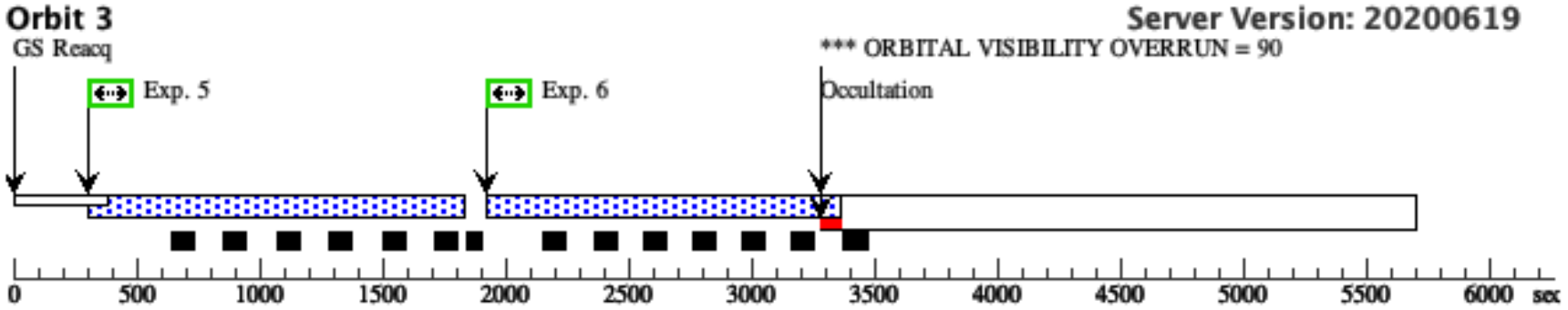
Exposures

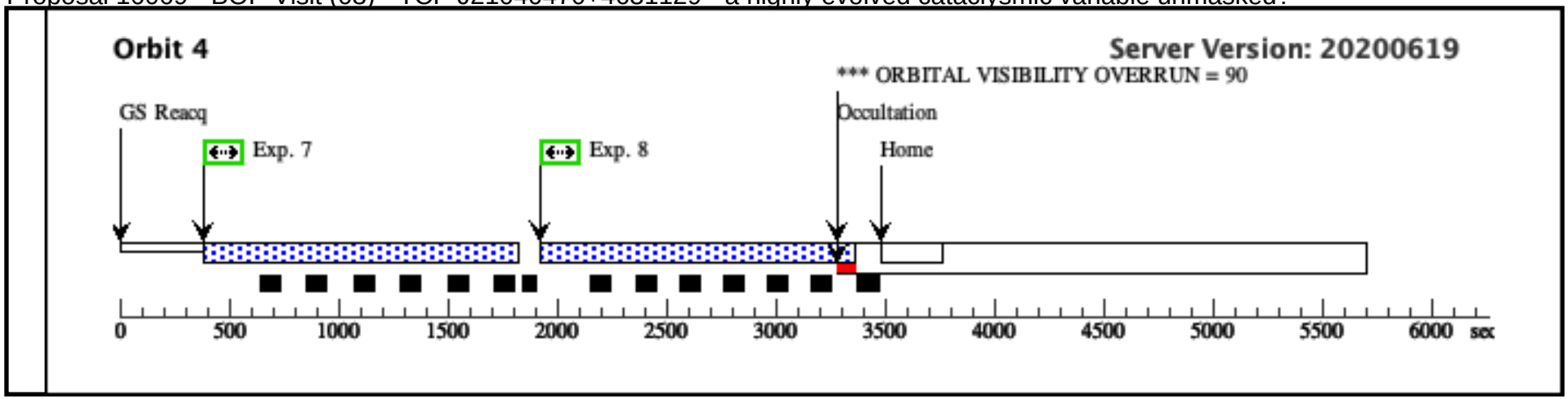
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/PEAKXD (COS.sa.1432641)	(2) TARGET01-SAFE-TARGET	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	LIFETIME-POS=LP4			5 Secs (5 Secs) *[==>]*	***[1]***
	Comments: We have good orbital phase coverage with Swift UVW1 (2600A) and SDSS u (3650A), amplitude and flux in the two bands are identical, so we adopt a flat spectrum in Flambda. At orbital minimum, the flux in Swift UVW1 is 2e-15 erg/cm2/s/AA, and we set up the target acquisition to achieve a S/N of 40 at that faintest phase. At orbital maximum, the system reaches 1.2e-14 erg/cm2/s/AA. This is a factor ~30 below the COS bright limit for the chosen setup.								
2	ACQ/PEAKD (COS.sa.1432641)	(2) TARGET01-SAFE-TARGET	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=0.9; CENTER=DEF; NUM-POS=5; LIFETIME-POS=LP4			5 Secs (5 Secs) *[==>]*	***[1]***
3	G130M @ 1291A, FP-POS=3 (COS.sp.1432643)	(2) TARGET01-SAFE-TARGET	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=300; FP-POS=3; LIFETIME-POS=LP4			2480 Secs (2480 Secs) *[==>]*	***[1]***
4	G130M @ 1291A, FP-POS=4 (COS.sp.1432643)	(2) TARGET01-SAFE-TARGET	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=300; FP-POS=4; LIFETIME-POS=LP4			2919 Secs (2919 Secs) *[==>]*	***[2]***
5	G130M @ 1222A, FP-POS=1 (COS.sp.1432817)	(2) TARGET01-SAFE-TARGET	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=215; FP-POS=1; LIFETIME-POS=LP4			1390 Secs (1390 Secs) *[==>]*	***[3]***
6	G130M @ 1222A, FP-POS=2 (COS.sp.1432817)	(2) TARGET01-SAFE-TARGET	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=200; FP-POS=2; LIFETIME-POS=LP4			1386 Secs (1386 Secs) *[==>]*	***[3]***
7	G130M @ 1222A, FP-POS=3 (COS.sp.1432817)	(2) TARGET01-SAFE-TARGET	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=215; FP-POS=3; LIFETIME-POS=LP4			1390 Secs (1390 Secs) *[==>]*	***[4]***
8	G130M @ 1222A, FP-POS=4 (COS.sp.1432817)	(2) TARGET01-SAFE-TARGET	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=200; FP-POS=4; LIFETIME-POS=LP4			1386 Secs (1386 Secs) *[==>]*	***[4]***

Orbit Structure





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Exp. 7
Exp. 8
Occultation
Home
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1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16069, HOPR COS spectroscopy, G130M @ 1291, 1222A (04), implementation Fri Oct 30 20:00:24 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: ORIENT 45D TO 285 D

Comments: This should be scheduled in evening-local time.Flags need to be cleared during the work day.

This is a HOPR for failed visit 01

Only two FP-POS settings allowed for the 1291A central wavelength.

This should be scheduled in evening-local time. Flags need to be cleared during the work day.

Diagnostics

(HOPR COS spectroscopy, G130M @ 1291, 1222A (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN
(HOPR COS spectroscopy, G130M @ 1291, 1222A (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN
(HOPR COS spectroscopy, G130M @ 1291, 1222A (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN
(HOPR COS spectroscopy, G130M @ 1291, 1222A (04)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

Fixed Targets

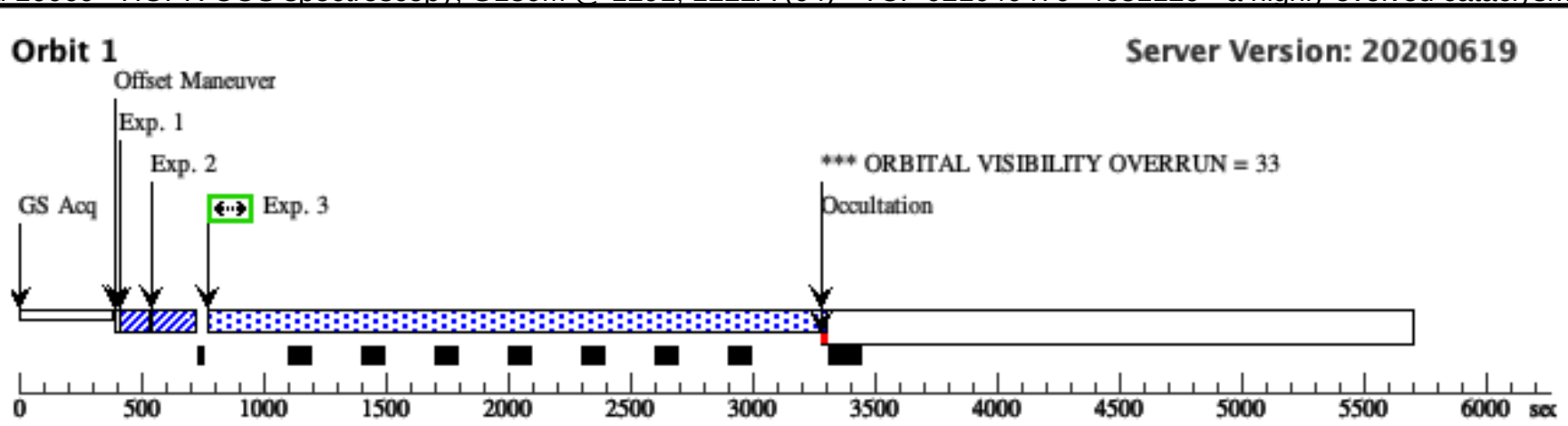
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	TCP-J21040470+4631129	RA: 21 04 4.6877 (316.0195321d) Dec: +46 31 13.75 (46.52049d) Equinox: J2000	Proper Motion RA: 6.229 mas/yr Proper Motion Dec: -46.319 mas/yr Epoch of Position: 2015.5	V=15 Swift UVW1=13.0	Reference Frame: ICRS

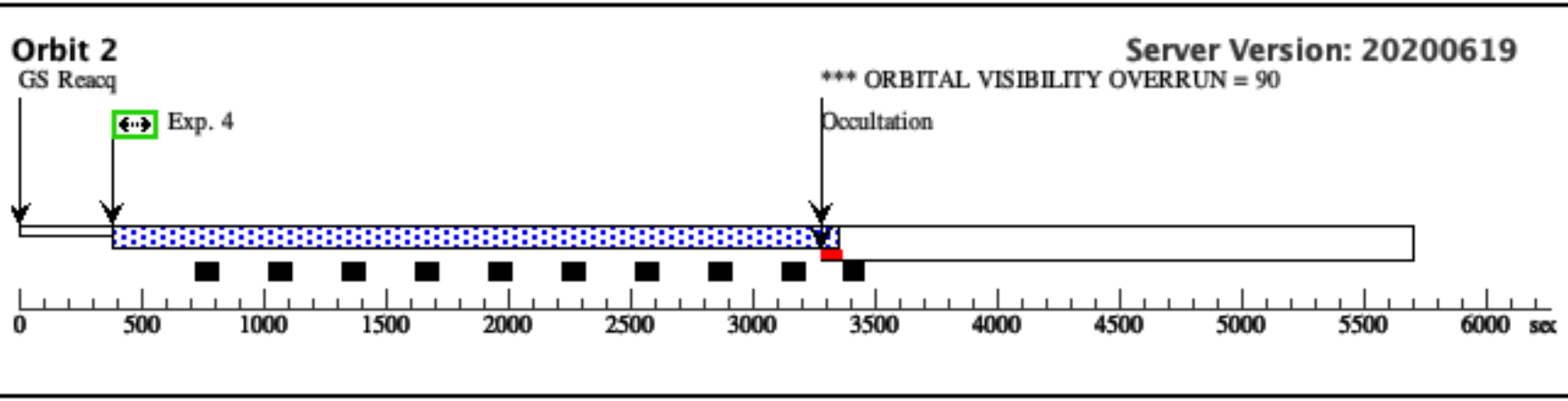
Comments:
Category=STAR
Description=[DWARF NOVA]
Extended=NO

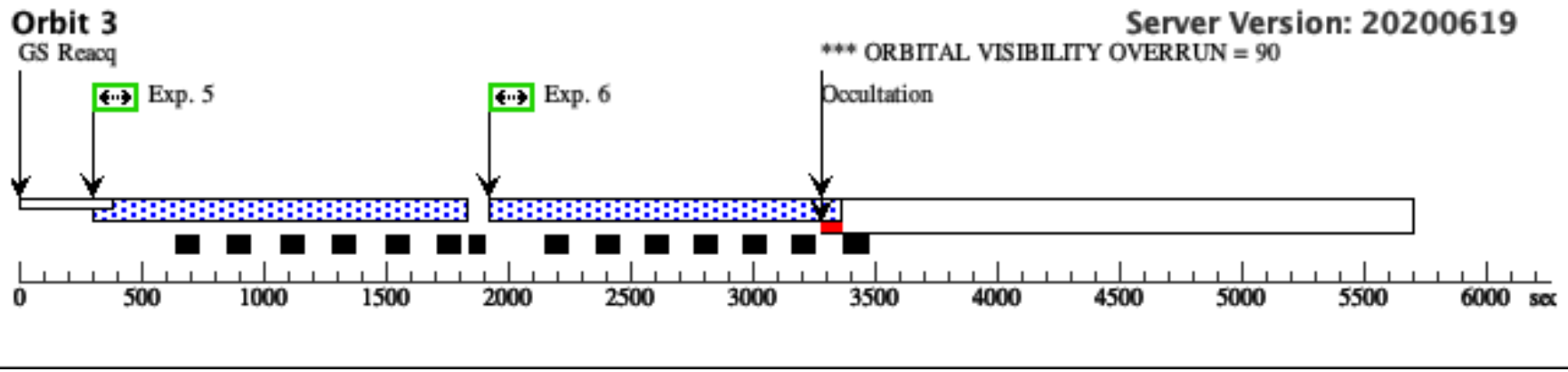
Exposures

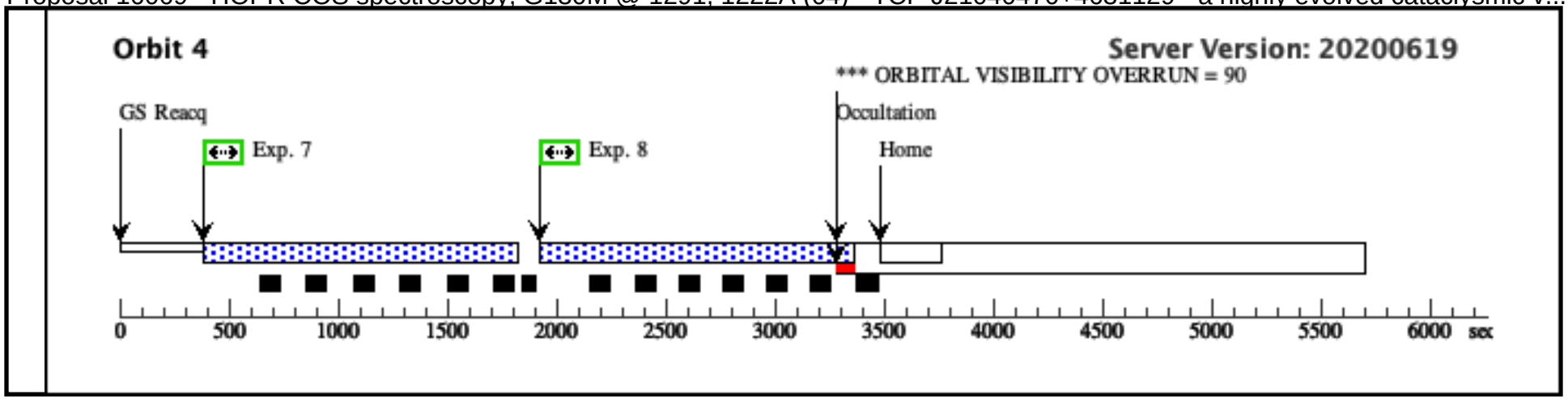
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/PEAKXD (COS.sa.1432641)	(1) TCP-J21040470+4631129	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	LIFETIME-POS=LP4	USE OFFSET V04SAF		5 Secs (5 Secs) *[==>]*	***[1]***
	Comments: We have good orbital phase coverage with Swift UVW1 (2600A) and SDSS u (3650A), amplitude and flux in the two bands are identical, so we adopt a flat spectrum in Flambda. At orbital minimum, the flux in Swift UVW1 is 2e-15 erg/cm2/s/AA, and we set up the target acquisition to achieve a S/N of 40 at that faintest phase. At orbital maximum, the system reaches 1.2e-14 erg/cm2/s/AA. This is a factor ~30 below the COS bright limit for the chosen setup.								
2	ACQ/PEAKD (COS.sa.1432641)	(1) TCP-J21040470+4631129	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=0.9; CENTER=DEF; NUM-POS=5; LIFETIME-POS=LP4	USE OFFSET V04SAF		5 Secs (5 Secs) *[==>]*	***[1]***
3	G130M @ 1291A, FP-POS=3 (COS.sp.1432643)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=300; FP-POS=3; LIFETIME-POS=LP4	USE OFFSET V04SAF		2480 Secs (2480 Secs) *[==>]*	***[1]***
4	G130M @ 1291A, FP-POS=4 (COS.sp.1432643)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=300; FP-POS=4; LIFETIME-POS=LP4	USE OFFSET V04SAF		2919 Secs (2919 Secs) *[==>]*	***[2]***
5	G130M @ 1222A, FP-POS=1 (COS.sp.1432817)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=215; FP-POS=1; LIFETIME-POS=LP4	USE OFFSET V04SAF		1390 Secs (1390 Secs) *[==>]*	***[3]***
6	G130M @ 1222A, FP-POS=2 (COS.sp.1432817)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=200; FP-POS=2; LIFETIME-POS=LP4	USE OFFSET V04SAF		1386 Secs (1386 Secs) *[==>]*	***[3]***
7	G130M @ 1222A, FP-POS=3 (COS.sp.1432817)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=215; FP-POS=3; LIFETIME-POS=LP4	USE OFFSET V04SAF		1390 Secs (1390 Secs) *[==>]*	***[4]***
8	G130M @ 1222A, FP-POS=4 (COS.sp.1432817)	(1) TCP-J21040470+4631129	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=200; FP-POS=4; LIFETIME-POS=LP4	USE OFFSET V04SAF		1386 Secs (1386 Secs) *[==>]*	***[4]***

Orbit Structure








Orbit 4
Server Version: 20200619
*** ORBITAL VISIBILITY OVERRUN = 90
GS Reacq
Exp. 7
Exp. 8
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec

Visit

Proposal 16069, S/C Visit (05), implementation Fri Oct 30 20:00:25 GMT 2020

Diagnostic Status: No Diagnostics

Scientific Instruments: S/C

Special Requirements: ORIENT 45D TO 285 D

Comments: This visit allocates and sets up the safe position offset slot for science visit 04 which will use that slot. This S/C visit should go earlier in the week while visit 04 will be at least 3 days later.The S/C visit will contain only 1 exposure. Note: weekends are to be avoided since the CS must clear the target within 24 hours of HST execution.

Fixed Targets

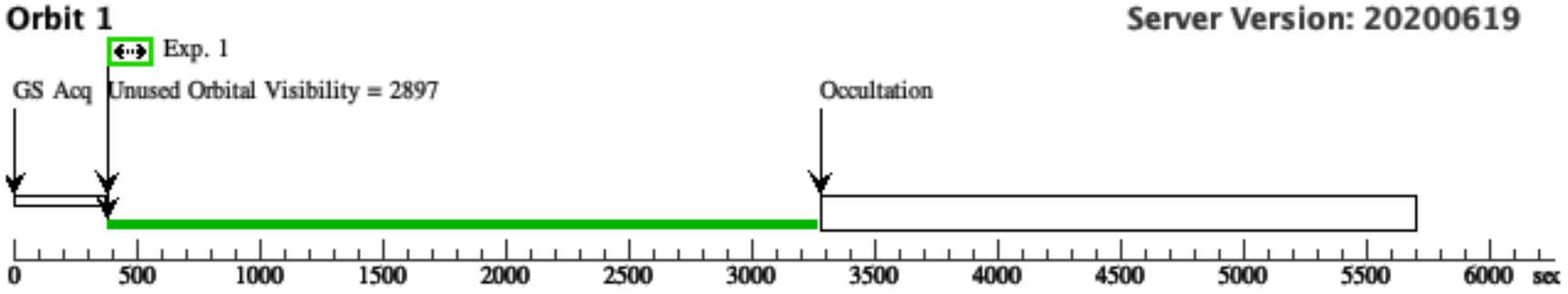
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	TCP-J21040470+4631129	RA: 21 04 4.6877 (316.0195321d) Dec: +46 31 13.75 (46.52049d) Equinox: J2000	Proper Motion RA: 6.229 mas/yr Proper Motion Dec: -46.319 mas/yr Epoch of Position: 2015.5	V=15 Swift UVW1=13.0	Reference Frame: ICRS

Comments:
Category=STAR
Description=[DWARF NOVA]
Extended=NO

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) TCP-J21040470+4631129	S/C, DATA, V1			POS TARG 229.13,-241.06; SAVE OFFSET V04 SAF; SPEC COM INSTR ECSLOTSET; QESIPARM ANGLE 210.1; QESIPARM DIST 9.841		5 Secs (5 Secs) *[==>]*	*[1]*

Orbit Structure



Visit

Proposal 16069, BOP VISIT (06), implementation Fri Oct 30 20:00:25 GMT 2020

Diagnostic Status: Warning

Scientific Instruments: COS/FUV

Special Requirements: ORIENT 45D TO 285 D

Comments: This visit is for BOP checking the safe target only and should not execute onboard HST.

Diagnostics

(BOP VISIT (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(BOP VISIT (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(BOP VISIT (06)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

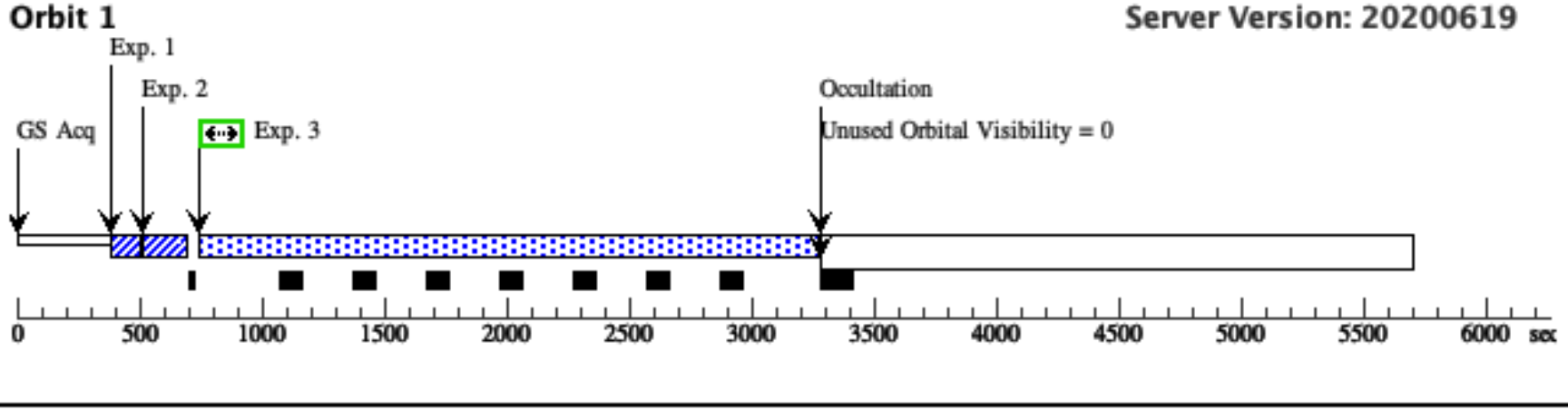
Fixed Targets

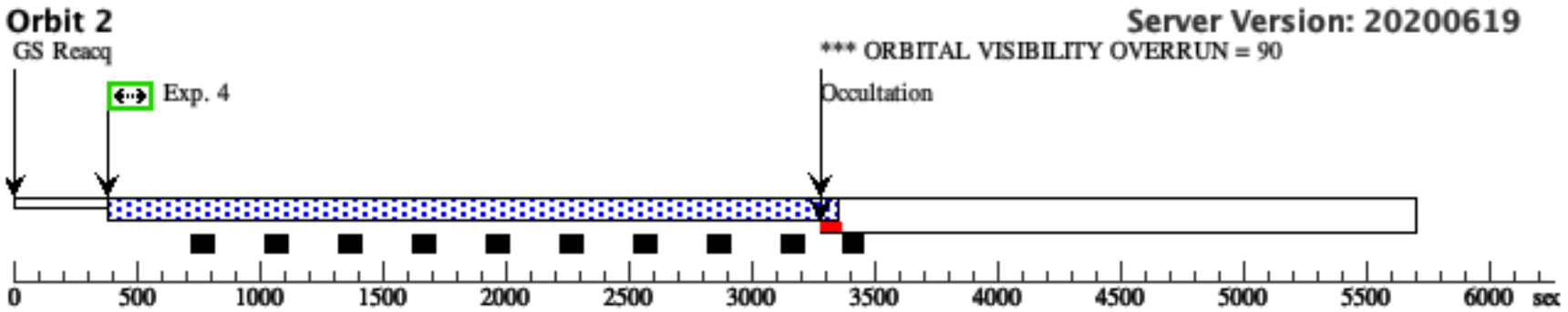
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	TCP-J21040470+4631129	RA: 21 04 4.6877 (316.0195321d) Dec: +46 31 13.75 (46.52049d) Equinox: J2000	Proper Motion RA: 6.229 mas/yr Proper Motion Dec: -46.319 mas/yr Epoch of Position: 2015.5	V=15 Swift UVW1=13.0	Reference Frame: ICRS
Comments: *Category=STAR* *Description=[DWARF NOVA]* *Extended=NO*					
(3)	TARGET01-SAFE-TARGET-HOPR	Offset from TCP-J21040470+4631129 RA Offset: -0.47 Secs Dec Offset: -8.516 Arcsec		V=15	Offset Position (TARGET01-SAFE-TARGET-HOPR)
Comments: This target is a blank piece of sky which is the bright object safe pointing and is 9.941 arcseconds away at a PA of 210.1 degrees from TCP-J21040470+4631129. *Category=UNIDENTIFIED* *Description=[BLANK FIELD]* *Extended=NO*					

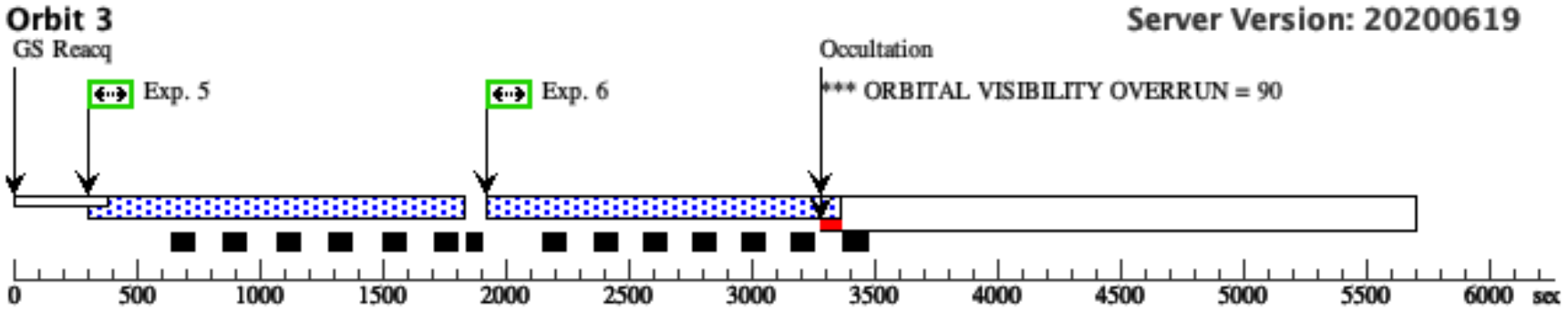
Exposures

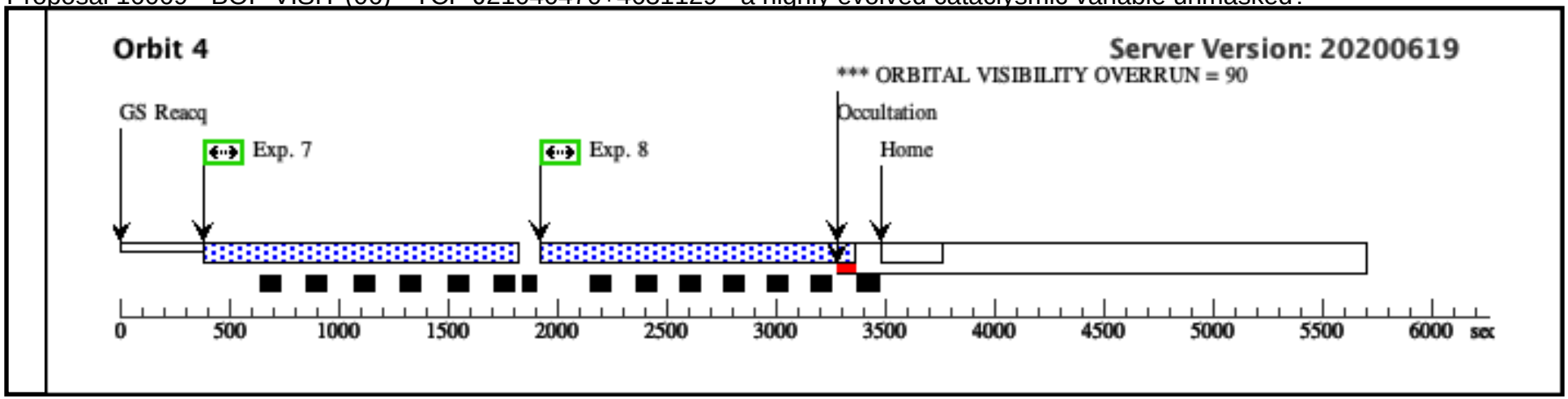
#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	ACQ/PEAKXD (COS.sa.1432641)	(3) TARGET01-SAFE-TARGET-HOPR	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	LIFETIME-POS=LP4			5 Secs (5 Secs) *[==>]*	*[1]*
	Comments: We have good orbital phase coverage with Swift UVW1 (2600A) and SDSS u (3650A), amplitude and flux in the two bands are identical, so we adopt a flat spectrum in Flambda. At orbital minimum, the flux in Swift UVW1 is 2e-15 erg/cm2/s/AA, and we set up the target acquisition to achieve a S/N of 40 at that faintest phase. At orbital maximum, the system reaches 1.2e-14 erg/cm2/s/AA. This is a factor ~30 below the COS bright limit for the chosen setup.								
2	ACQ/PEAKD (COS.sa.1432641)	(3) TARGET01-SAFE-TARGET-HOPR	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	STEP-SIZE=0.9; CENTER=DEF; NUM-POS=5; LIFETIME-POS=LP4			5 Secs (5 Secs) *[==>]*	*[1]*
3	G130M @ 1291A, FP-POS=3 (COS.sp.1432643)	(3) TARGET01-SAFE-TARGET-HOPR	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=3000; FP-POS=3; LIFETIME-POS=LP4			2480 Secs (2480 Secs) *[==>]*	*[1]*
4	G130M @ 1291A, FP-POS=4 (COS.sp.1432643)	(3) TARGET01-SAFE-TARGET-HOPR	COS/FUV, TIME-TAG, PSA	G130M 1291 A	BUFFER-TIME=3000; FP-POS=4; LIFETIME-POS=LP4			2919 Secs (2919 Secs) *[==>]*	*[2]*
5	G130M @ 1222A, FP-POS=1 (COS.sp.1432817)	(3) TARGET01-SAFE-TARGET-HOPR	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=2155; FP-POS=1; LIFETIME-POS=LP4			1390 Secs (1390 Secs) *[==>]*	*[3]*
6	G130M @ 1222A, FP-POS=2 (COS.sp.1432817)	(3) TARGET01-SAFE-TARGET-HOPR	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=2000; FP-POS=2; LIFETIME-POS=LP4			1386 Secs (1386 Secs) *[==>]*	*[3]*
7	G130M @ 1222A, FP-POS=3 (COS.sp.1432817)	(3) TARGET01-SAFE-TARGET-HOPR	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=2155; FP-POS=3; LIFETIME-POS=LP4			1390 Secs (1390 Secs) *[==>]*	*[4]*
8	G130M @ 1222A, FP-POS=4 (COS.sp.1432817)	(3) TARGET01-SAFE-TARGET-HOPR	COS/FUV, TIME-TAG, PSA	G130M 1222 A	BUFFER-TIME=2000; FP-POS=4; LIFETIME-POS=LP4			1386 Secs (1386 Secs) *[==>]*	*[4]*

Orbit Structure








Orbit 4
Server Version: 20200619
*** ORBITAL VISIBILITY OVERRUN = 90
GS Reacq
Exp. 7
Exp. 8
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
sec