



18369 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray binary Cygnus X- 1.

Cycle: 34, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
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Dr. Jiri Svoboda (CoI) (ESA Member) (CoPI)	Astronomical Institute, Academy of Sciences of Czech Rep
Dr. Varsha Ramachandran (CoI) (ESA Member) (CoPI)	Universitat Heidelberg
Dr. Brankica Kubatova (CoI) (ESA Member) (CoPI)	Astronomical Institute, Academy of Sciences of Czech Rep
Petr Hadrava (CoI) (ESA Member) (CoPI)	Astronomical Institute, Academy of Sciences of Czech Rep
Dr. Noel Castro Segura (CoI) (ESA Member) (CoPI)	University of Warwick

VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) HD-226868	COS/FUV	3	10-Aug-2026 14:02:24.0	yes
02	(1) HD-226868	COS/FUV	3	10-Aug-2026 14:02:26.0	yes
03	(1) HD-226868	COS/FUV	3	10-Aug-2026 14:02:28.0	yes
04	(1) HD-226868	COS/FUV	3	10-Aug-2026 14:02:29.0	yes
05	(1) HD-226868	COS/FUV	3	10-Aug-2026 14:02:31.0	yes

15 Total Orbits Used

ABSTRACT

Black holes (BHs) paired with massive stars are among the most extreme objects in the universe. These systems - known as high-mass X-ray binaries - are unique cosmic laboratories and our closest windows into accretion physics around compact objects. Yet the stellar winds driving their accretion remain poorly understood. In the iconic high-mass X-ray binary system Cygnus X-1, the massive star continuously loses mass through its wind, which is captured by the BH, forming a bright accretion disk radiating in X-rays. This system regularly switches between two main accretion states in X-rays: a hard state - where the Comptonized emission from the hot inner plasma dominates - and a soft state - where the disk blackbody emission from the disk dominates. Crucially, X-rays directly alter the wind itself: a low X-ray flux in the hard state produces a faster, stronger wind, making multiwavelength observations essential. Yet despite decades of study, the Far-UV spectrum of Cygnus X-1 in the hard state has never been captured by the Hubble Space Telescope; a 2004 attempt failed due to instrument failure. This is the gap we will close. With HST/COS UV spectroscopy, simultaneously triggered with daily MAXI X-ray monitoring and high-resolution optical observations from our dedicated 2m telescope, we will deliver the first complete characterization of the stellar wind feeding a BH. Combined with state-of-the-art atmospheric models, these observations will resolve a long-standing mystery: how do massive stars feed BHs, and what drives the wind that sustains this cosmic powerhouse?

OBSERVING DESCRIPTION

Cygnus X-1 is a galactic black hole high-mass X-ray binary located at 2.2 kpc, has an orbital period of ~ 5.6 days and a V-magnitude of 8.91. This is a variable X-ray source, where changes in its emission track changes in the accretion disk. In this proposal, we aim to study the stellar wind of Cygnus X-1 in the hard X-ray spectral state, when the X-ray emission is the lowest, and the UV emission from the stellar wind is the strongest.

In order to get Cygnus X-1 in the hard state, we have one Disruptive ToO with a turn-around time lower than 3 weeks with 5 activations, with a 90% chance that the system remains in the hard state for more than 48 hours.

We were allocated 15 HST orbits and we need 15 spectra at different orbital phases of the system to apply the Fourier Disentangling method. Thus, we need 5 spectra per grating using the three following COS instruments: G130M/1096, G130M/1318, and G160M/1577. The corresponding science exposure times are ~ 3.0 ks, ~ 1.8 ks, and ~ 1.2 ks, respectively. The source is visible for ~ 53 mins over the 96 mins of one HST orbit. Hence, allowing on average only one grating to observe per HST orbit.

Since Cygnus X-1 advances by only ~ 0.01 in orbital phase between two consecutive HST orbits, we plan to observe with the three gratings over up to three consecutive HST orbits. This strategy ensures that the three spectra obtained during a given visit probe nearly identical orbital phases. We then wait approximately one day, corresponding to an orbital-phase shift of about 0.1, before repeating the sequence. Repeating this sequence over five visits will provide the required 15 spectra while achieving sufficiently broad and well-sampled orbital-phase coverage for the Fourier

Disentangling analysis.

Proposal 18369 - Visit 01 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

Visit	Proposal 18369, Visit 01					Mon Aug 10 18:02:32 GMT 2026
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	Scientific Instruments: COS/FUV					
	Special Requirements: TOO MIN RESPONSE TIME 3.0D; TOO MAX RESPONSE TIME 7.0D					
Diagnos	(Visit 01) Warning (Form): For the best data quality, it is generally required to use all four FP-POS positions at a given COS cenwave (or 2 positions for certain exception cases). See extended explanation in the diagnostic browser.					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	HD-226868	RA: 19 58 21.6757 (299.5903154d) Dec: +35 12 5.78 (35.20161d) Equinox: J2000	Proper Motion RA: -3.812000000000003 mas/yr Proper Motion Dec: -6.310000048870279 mas/yr Parallax: 4.439E-4" Epoch of Position: 2000	V=8.91	Reference Frame: ICRS
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					
	SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.					
	Category=STAR					
	Description=[X-RAY TRANSIENT]					
	Extended=NO					

Proposal 18369 - Visit 01 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

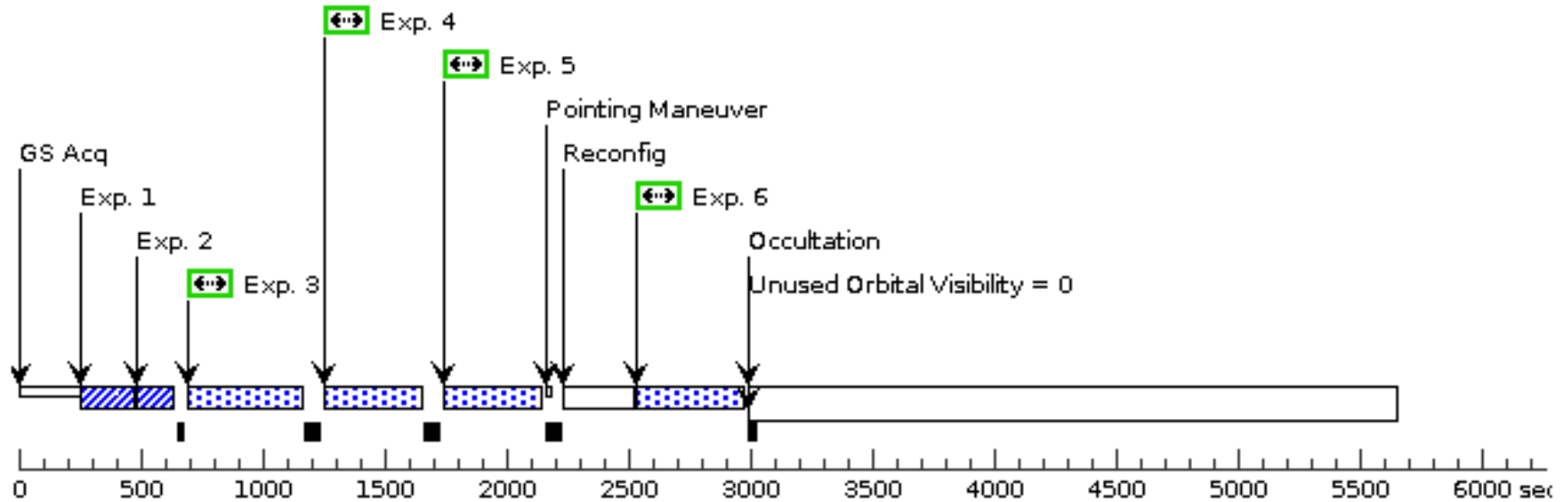
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ACQ/PEAK XD (COS.sa.236 4002)	(1) HD-226868	COS/FUV, ACQ/PEAKXD, PSA	G160M 1577 A	CENTER=FLUX-W T; LIFETIME-POS=L P10; NUM-POS=3; SEGMENT=BOTH; STEP-SIZE=1.3			0.8 Secs (0.8 Secs) [==>]	[1]
	2	ACQ/PEAK D (COS.sa.236 4002)	(1) HD-226868	COS/FUV, ACQ/PEAKD, PSA	G160M 1577 A	CENTER=FLUX-W T-FLR; LIFETIME-POS=L P10; NUM-POS=5; SEGMENT=BOTH; STEP-SIZE=0.9			0.8 Secs (0.8 Secs) [==>]	[1]
	3	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=1; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	4	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=2; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	5	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=3; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	6	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=1; FLASH=YES			480 Secs (251 Secs) [==>251.0 Secs]	[1]

Proposal 18369 - Visit 01 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

	7	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=2; FLASH=YES	480 Secs (798 Secs) [==>798.0 Secs]	[2]
	8	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=3; FLASH=YES	480 Secs (798 Secs) [==>798.0 Secs]	[2]
	9	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=1	780 Secs (20 Secs) [==>20.0 Secs]	[2]
	10	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=2	780 Secs (1035 Secs) [==>1035.0 Secs]	[3]
	11	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=3	780 Secs (1036 Secs) [==>1036.0 Secs]	[3]

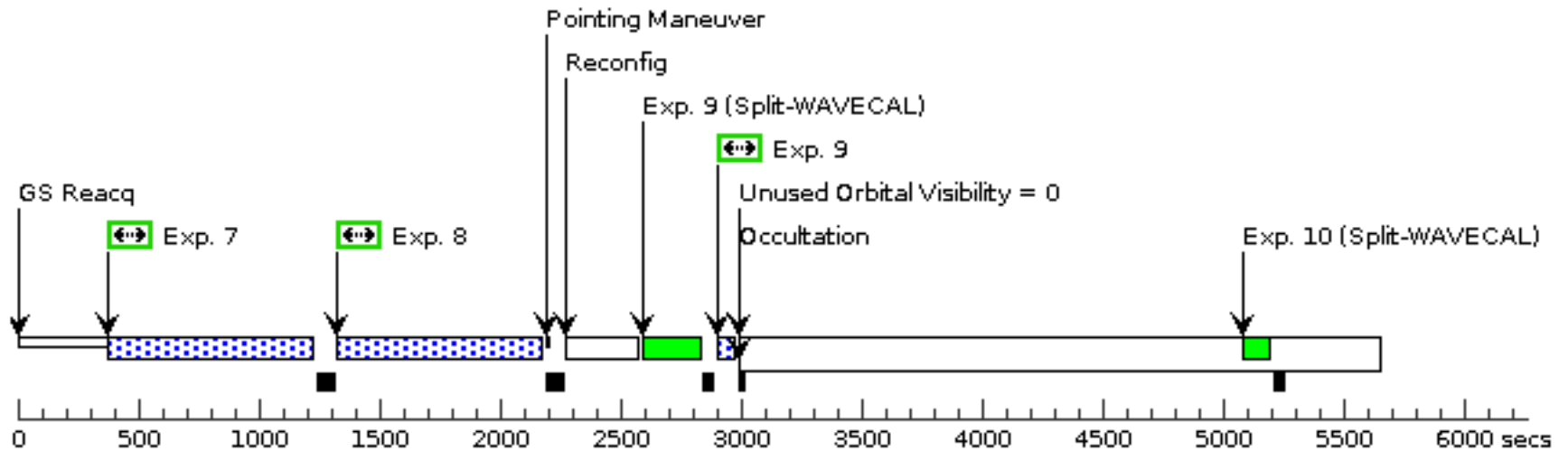
Orbit 1

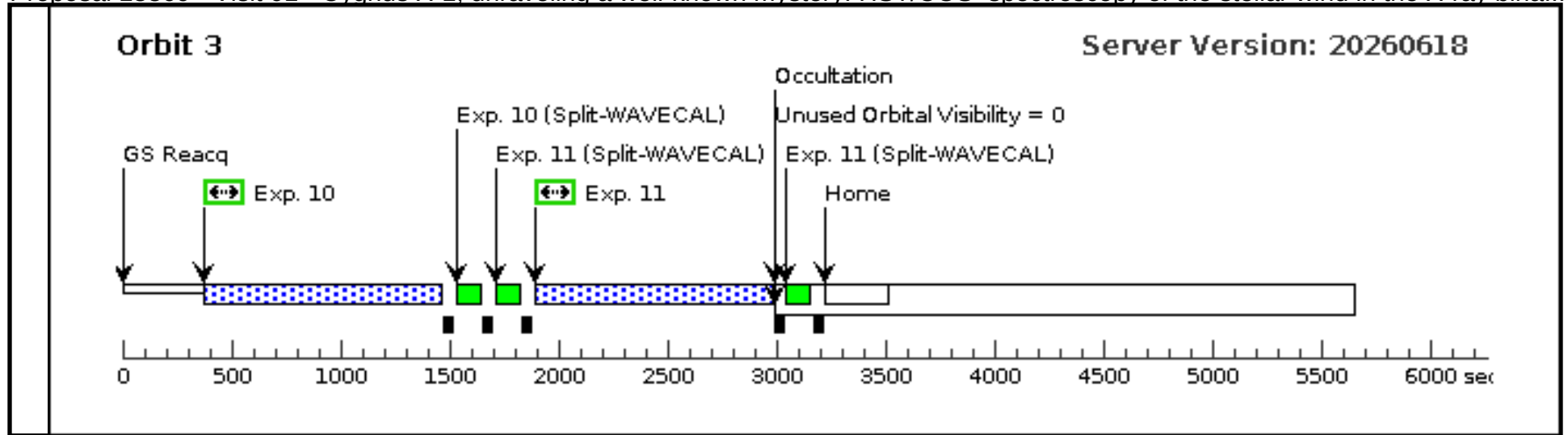
Server Version: 20260618



Orbit 2

Server Version: 20260618





Proposal 18369 - Visit 02 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

Visit	Proposal 18369, Visit 02 Mon Aug 10 18:02:32 GMT 2026 Diagnostic Status: Warning Scientific Instruments: COS/FUV Special Requirements: TOO MIN RESPONSE TIME 3.0D; TOO MAX RESPONSE TIME 7.0D				
	(Visit 02) Warning (Form): For the best data quality, it is generally required to use all four FP-POS positions at a given COS cenwave (or 2 positions for certain exception cases). See extended explanation in the diagnostic browser.				
Diagnostics					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
	(1)	HD-226868	RA: 19 58 21.6757 (299.5903154d) Dec: +35 12 5.78 (35.20161d) Equinox: J2000	Proper Motion RA: -3.812000000000003 mas/yr Proper Motion Dec: -6.310000048870279 mas/yr Parallax: 4.439E-4" Epoch of Position: 2000	V=8.91
Fixed Targets	Miscellaneous Reference Frame: ICRS				
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM. Category=STAR Description=[X-RAY TRANSIENT] Extended=NO				

Proposal 18369 - Visit 02 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

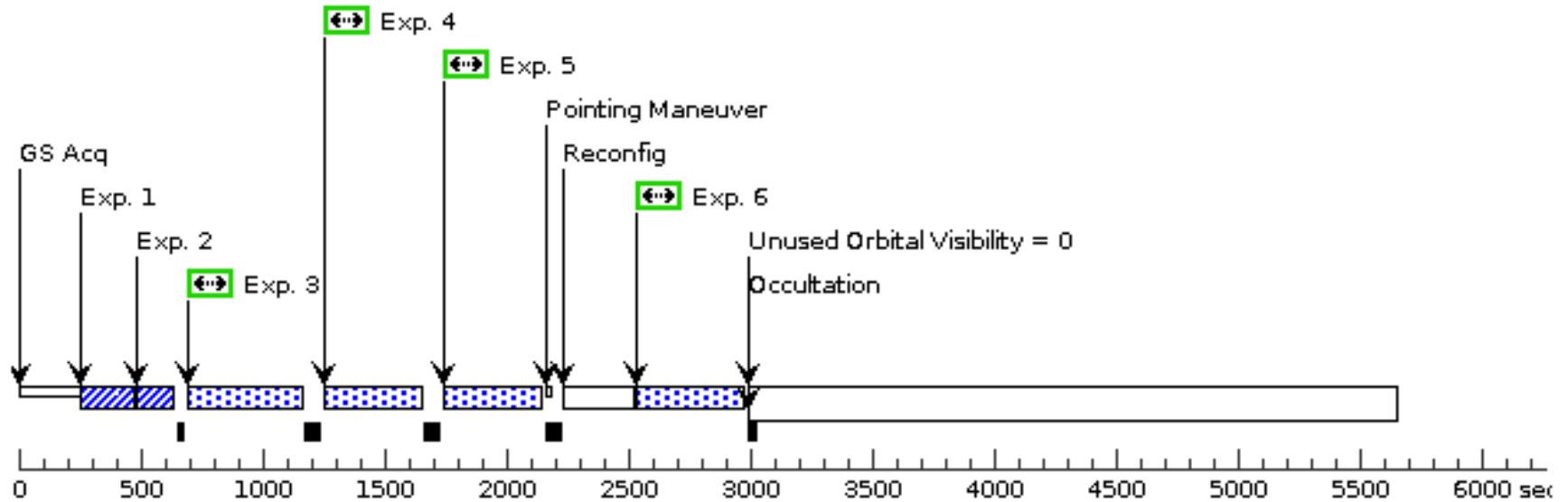
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ACQ/PEAK XD (COS.sa.236 4002)	(1) HD-226868	COS/FUV, ACQ/PEAKXD, PSA	G160M 1577 A	CENTER=FLUX-W T; LIFETIME-POS=L P10; NUM-POS=3; SEGMENT=BOTH; STEP-SIZE=1.3			0.8 Secs (0.8 Secs) [==>]	[1]
	2	ACQ/PEAK D (COS.sa.236 4002)	(1) HD-226868	COS/FUV, ACQ/PEAKD, PSA	G160M 1577 A	CENTER=FLUX-W T-FLR; LIFETIME-POS=L P10; NUM-POS=5; SEGMENT=BOTH; STEP-SIZE=0.9			0.8 Secs (0.8 Secs) [==>]	[1]
	3	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=1; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	4	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=2; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	5	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=3; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	6	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=1; FLASH=YES			480 Secs (251 Secs) [==>251.0 Secs]	[1]

Proposal 18369 - Visit 02 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

	7	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=2; FLASH=YES	480 Secs (798 Secs) [==>798.0 Secs]	[2]
	8	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=3; FLASH=YES	480 Secs (798 Secs) [==>798.0 Secs]	[2]
	9	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=1	780 Secs (20 Secs) [==>20.0 Secs]	[2]
	10	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=2	780 Secs (1035 Secs) [==>1035.0 Secs]	[3]
	11	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=3	780 Secs (1036 Secs) [==>1036.0 Secs]	[3]

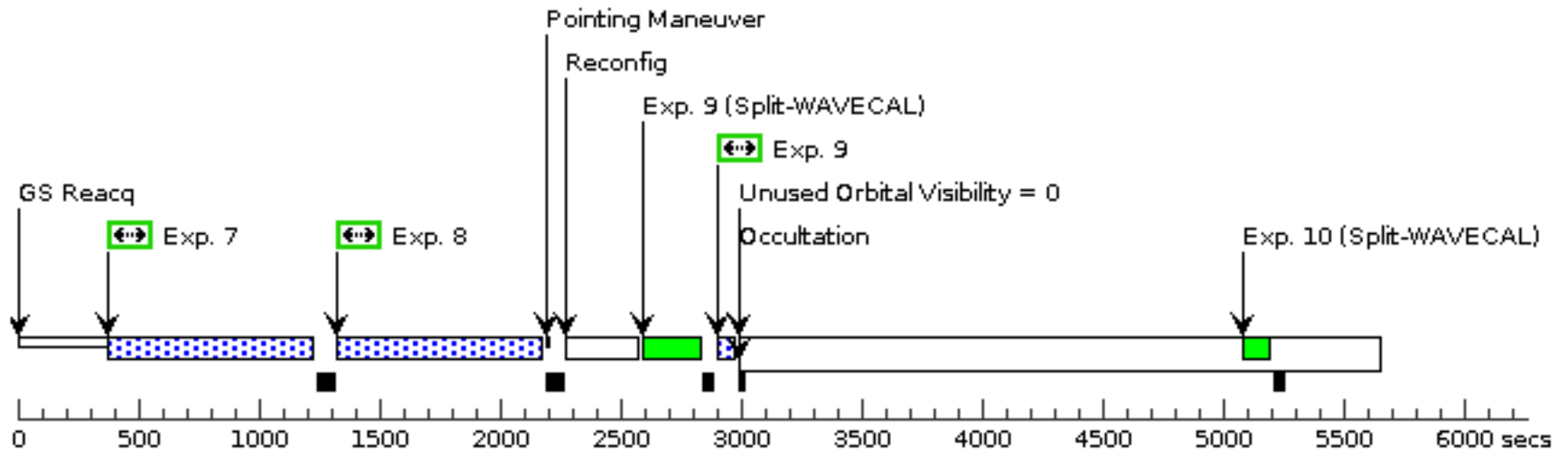
Orbit 1

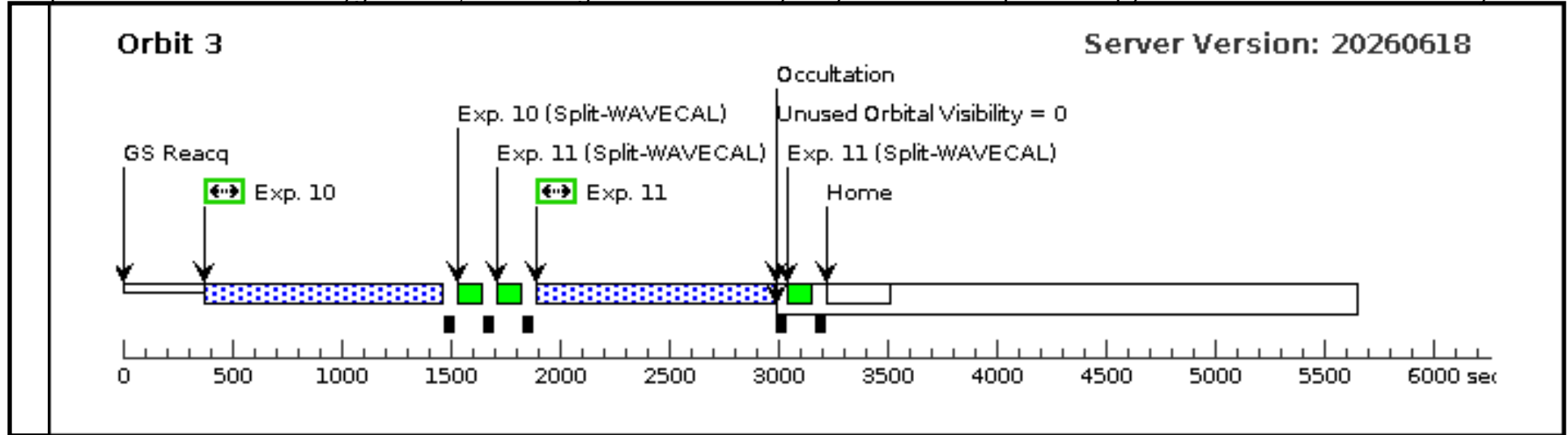
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Orbit 2

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Proposal 18369 - Visit 03 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

Visit	Proposal 18369, Visit 03 Diagnostic Status: Warning Scientific Instruments: COS/FUV Special Requirements: TOO MIN RESPONSE TIME 3.0D; TOO MAX RESPONSE TIME 7.0D					Mon Aug 10 18:02:32 GMT 2026
	(Visit 03) Warning (Form): For the best data quality, it is generally required to use all four FP-POS positions at a given COS cenwave (or 2 positions for certain exception cases). See extended explanation in the diagnostic browser.					
Diagnostics						
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	HD-226868	RA: 19 58 21.6757 (299.5903154d) Dec: +35 12 5.78 (35.20161d) Equinox: J2000	Proper Motion RA: -3.8120000000000003 mas/yr Proper Motion Dec: -6.310000048870279 mas/yr Parallax: 4.439E-4" Epoch of Position: 2000	V=8.91	Reference Frame: ICRS
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					
	SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM. Category=STAR Description=[X-RAY TRANSIENT] Extended=NO					

Proposal 18369 - Visit 03 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

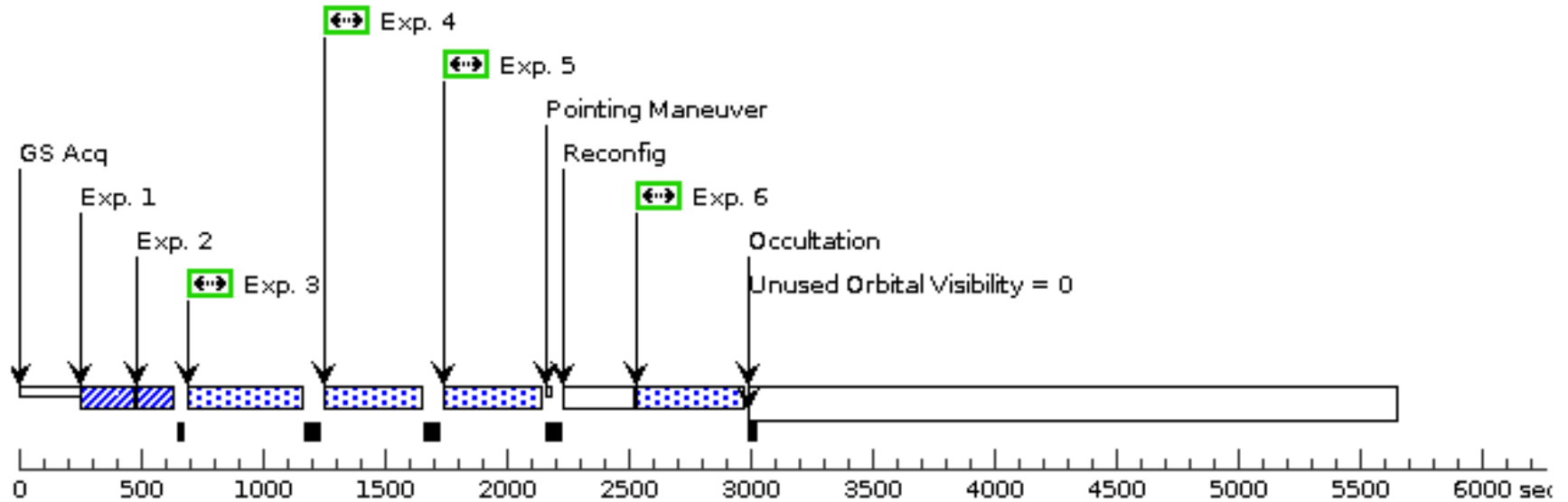
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ACQ/PEAK XD (COS.sa.236 4002)	(1) HD-226868	COS/FUV, ACQ/PEAKXD, PSA	G160M 1577 A	CENTER=FLUX-W T; LIFETIME-POS=L P10; NUM-POS=3; SEGMENT=BOTH; STEP-SIZE=1.3			0.8 Secs (0.8 Secs) [==>]	[1]
	2	ACQ/PEAK D (COS.sa.236 4002)	(1) HD-226868	COS/FUV, ACQ/PEAKD, PSA	G160M 1577 A	CENTER=FLUX-W T-FLR; LIFETIME-POS=L P10; NUM-POS=5; SEGMENT=BOTH; STEP-SIZE=0.9			0.8 Secs (0.8 Secs) [==>]	[1]
	3	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=1; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	4	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=2; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	5	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=3; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	6	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=1; FLASH=YES			480 Secs (251 Secs) [==>251.0 Secs]	[1]

Proposal 18369 - Visit 03 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

	7	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=2; FLASH=YES	480 Secs (798 Secs) [==>798.0 Secs]	[2]
	8	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=3; FLASH=YES	480 Secs (798 Secs) [==>798.0 Secs]	[2]
	9	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=1	780 Secs (20 Secs) [==>20.0 Secs]	[2]
	10	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=2	780 Secs (1035 Secs) [==>1035.0 Secs]	[3]
	11	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=3	780 Secs (1036 Secs) [==>1036.0 Secs]	[3]

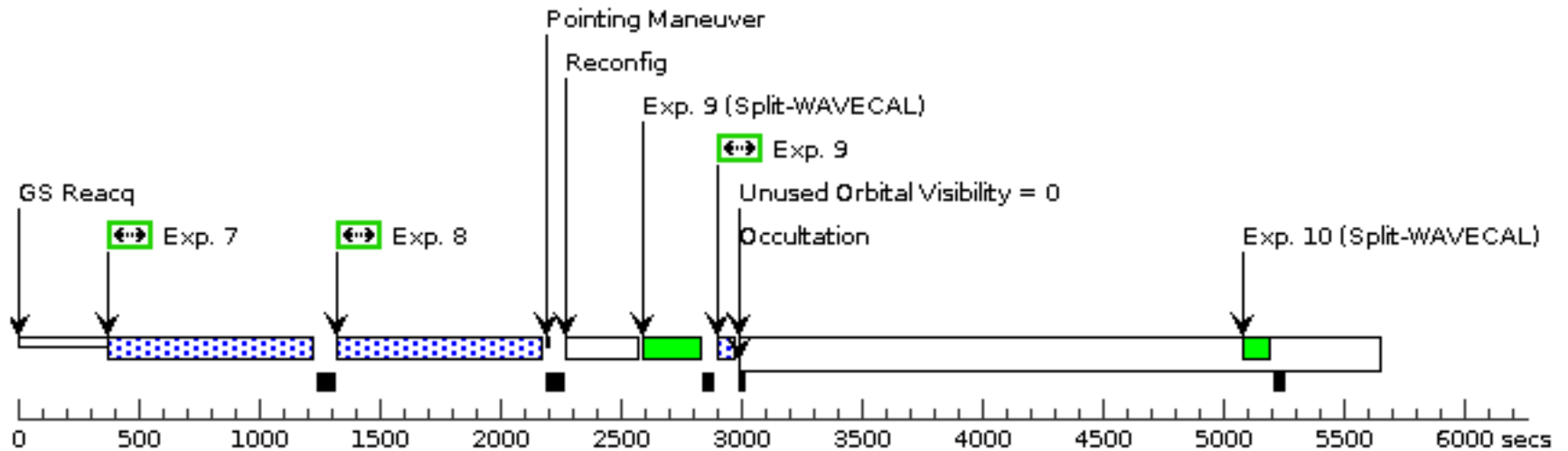
Orbit 1

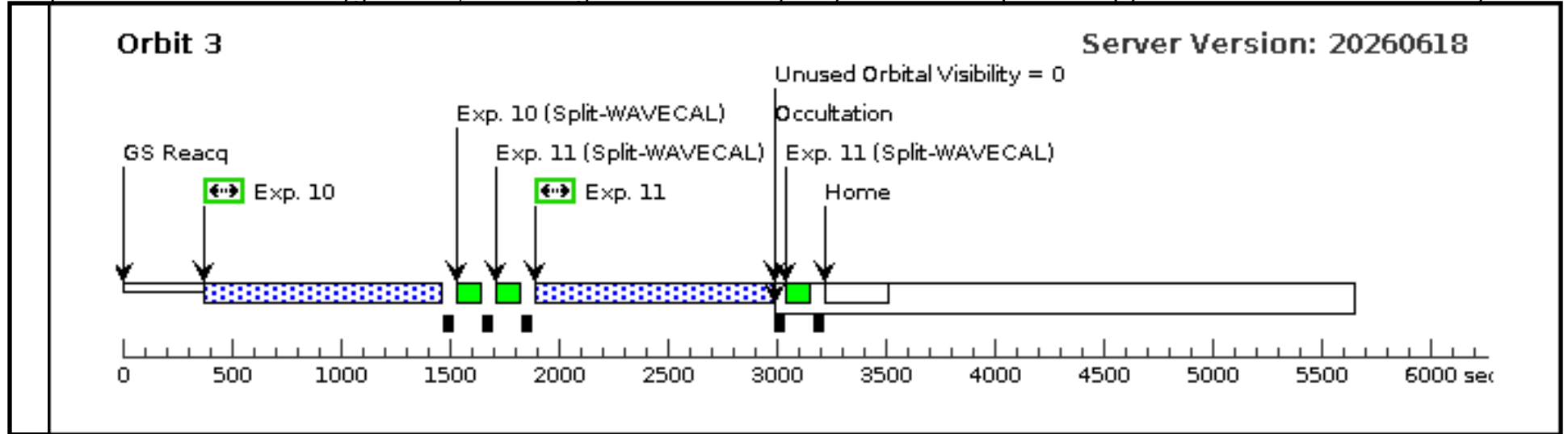
Server Version: 20260618



Orbit 2

Server Version: 20260618





Proposal 18369 - Visit 04 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

Visit	Proposal 18369, Visit 04 Mon Aug 10 18:02:32 GMT 2026 Diagnostic Status: Warning Scientific Instruments: COS/FUV Special Requirements: TOO MIN RESPONSE TIME 3.0D; TOO MAX RESPONSE TIME 7.0D				
	(Visit 04) Warning (Form): For the best data quality, it is generally required to use all four FP-POS positions at a given COS cenwave (or 2 positions for certain exception cases). See extended explanation in the diagnostic browser.				
Diagnostics					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
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Fixed Targets	Miscellaneous Reference Frame: ICRS				
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM. Category=STAR Description=[X-RAY TRANSIENT] Extended=NO				

Proposal 18369 - Visit 04 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

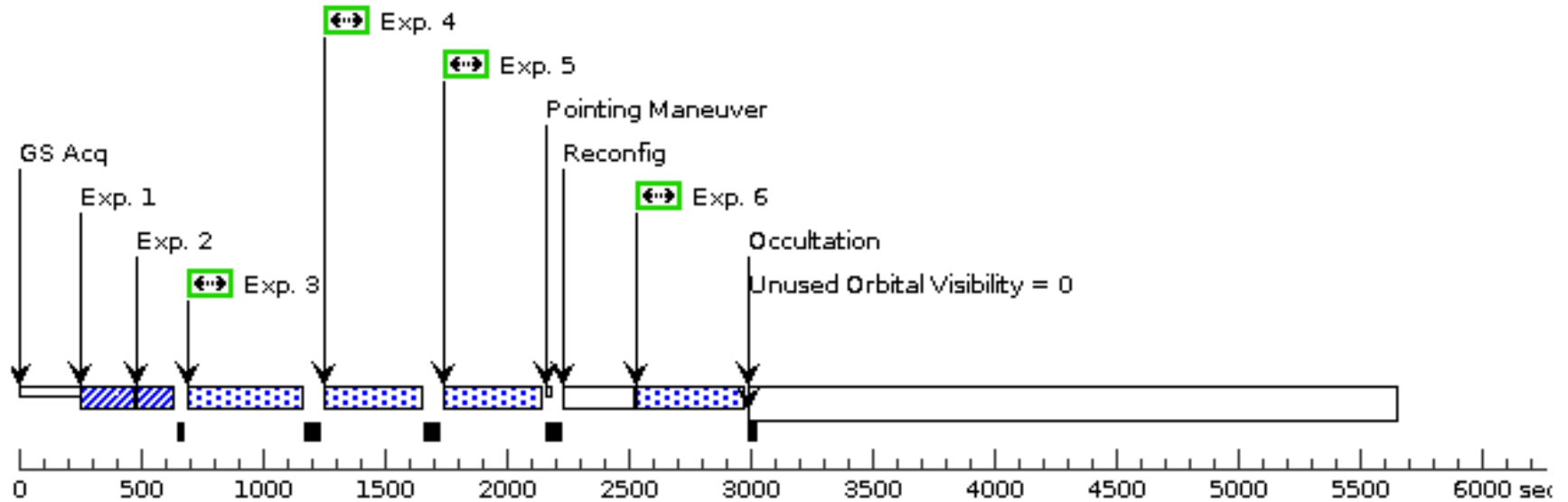
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ACQ/PEAK XD (COS.sa.236 4002)	(1) HD-226868	COS/FUV, ACQ/PEAKXD, PSA	G160M 1577 A	CENTER=FLUX-W T; LIFETIME-POS=L P10; NUM-POS=3; SEGMENT=BOTH; STEP-SIZE=1.3			0.8 Secs (0.8 Secs) [==>]	[1]
	2	ACQ/PEAK D (COS.sa.236 4002)	(1) HD-226868	COS/FUV, ACQ/PEAKD, PSA	G160M 1577 A	CENTER=FLUX-W T-FLR; LIFETIME-POS=L P10; NUM-POS=5; SEGMENT=BOTH; STEP-SIZE=0.9			0.8 Secs (0.8 Secs) [==>]	[1]
	3	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=1; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	4	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=2; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	5	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=3; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	6	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=1; FLASH=YES			480 Secs (251 Secs) [==>251.0 Secs]	[1]

Proposal 18369 - Visit 04 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

	7	G130M/131 (1) HD-226868 8 spect 1 (COS.sp.236 0758)	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=2; FLASH=YES	480 Secs (798 Secs) [==>798.0 Secs]	[2]
	8	G130M/131 (1) HD-226868 8 spect 1 (COS.sp.236 0758)	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=3; FLASH=YES	480 Secs (798 Secs) [==>798.0 Secs]	[2]
	9	G130M/109 (1) HD-226868 6 spect 1 (COS.sp.236 0543)	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=1	780 Secs (20 Secs) [==>20.0 Secs]	[2]
	10	G130M/109 (1) HD-226868 6 spect 1 (COS.sp.236 0543)	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=2	780 Secs (1035 Secs) [==>1035.0 Secs]	[3]
	11	G130M/109 (1) HD-226868 6 spect 1 (COS.sp.236 0543)	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=3	780 Secs (1036 Secs) [==>1036.0 Secs]	[3]

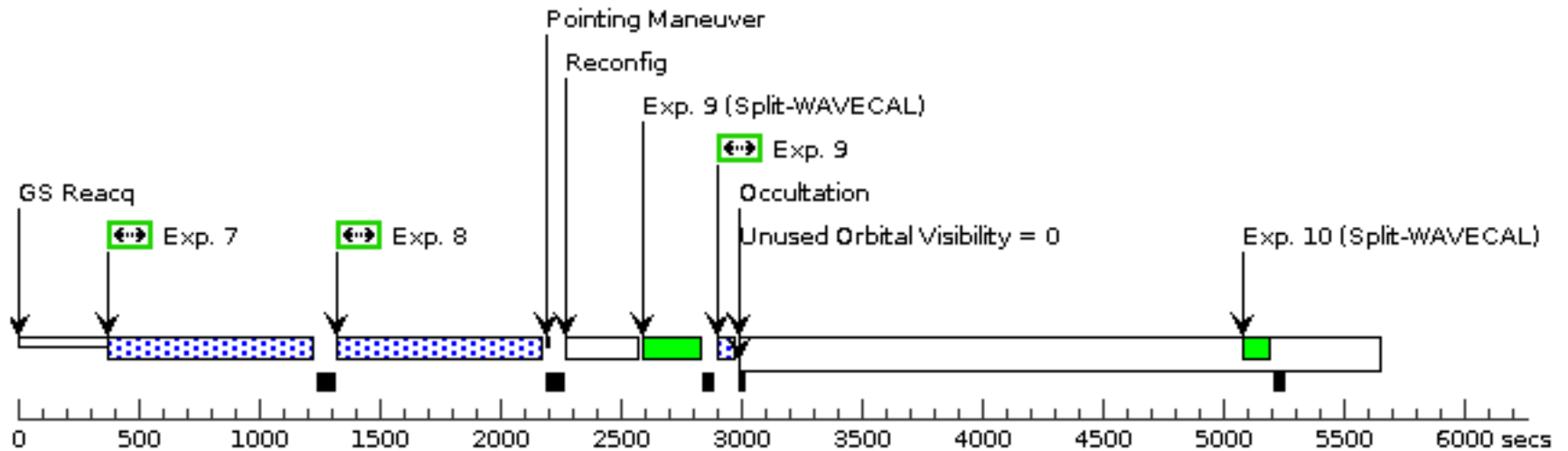
Orbit 1

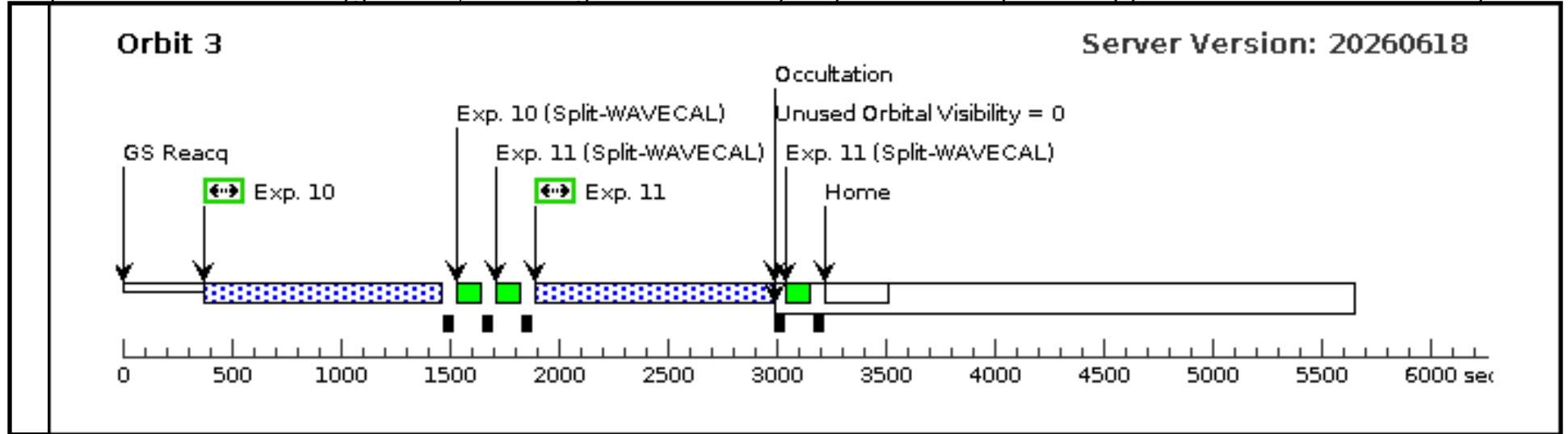
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Orbit 2

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Proposal 18369 - Visit 05 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

Visit	Proposal 18369, Visit 05					Mon Aug 10 18:02:32 GMT 2026
	Diagnostic Status: Warning					
	Scientific Instruments: COS/FUV					
	Special Requirements: TOO MIN RESPONSE TIME 3.0D; TOO MAX RESPONSE TIME 7.0D					
Diagnos	(Visit 05) Warning (Form): For the best data quality, it is generally required to use all four FP-POS positions at a given COS cenwave (or 2 positions for certain exception cases). See extended explanation in the diagnostic browser.					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	HD-226868	RA: 19 58 21.6757 (299.5903154d) Dec: +35 12 5.78 (35.20161d) Equinox: J2000	Proper Motion RA: -3.812000000000003 mas/yr Proper Motion Dec: -6.310000048870279 mas/yr Parallax: 4.439E-4" Epoch of Position: 2000	V=8.91	Reference Frame: ICRS
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					
	SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.					
	Category=STAR					
	Description=[X-RAY TRANSIENT]					
Extended=NO						

Proposal 18369 - Visit 05 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

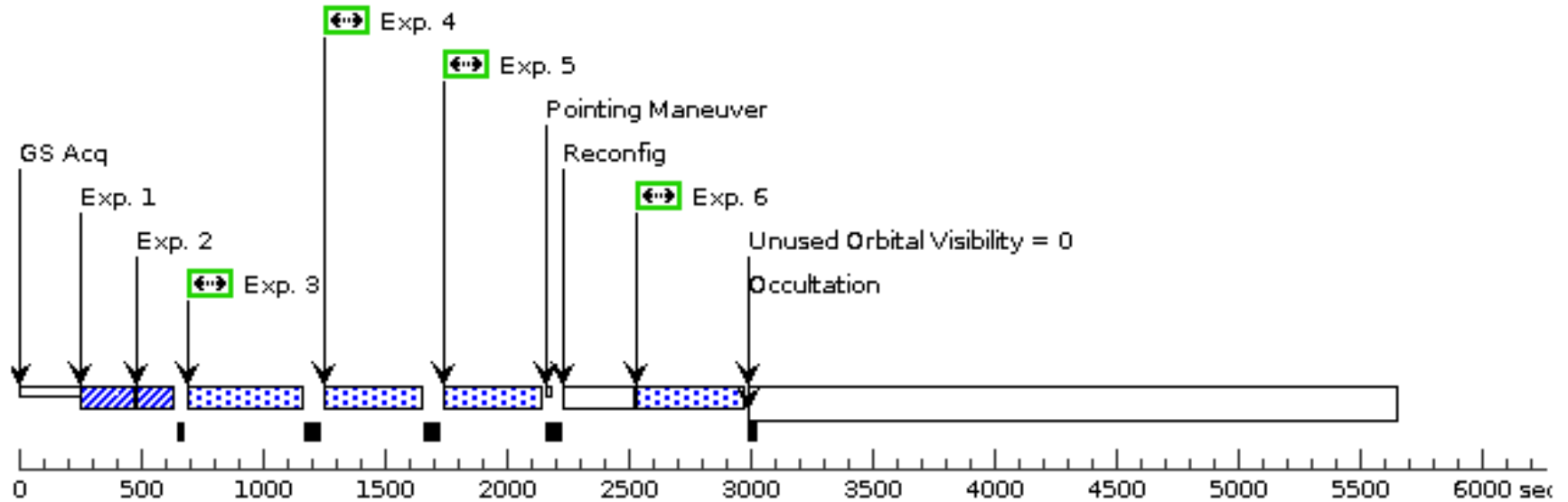
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ACQ/PEAK XD (COS.sa.236 4002)	(1) HD-226868	COS/FUV, ACQ/PEAKXD, PSA	G160M 1577 A	CENTER=FLUX-W T; LIFETIME-POS=L P10; NUM-POS=3; SEGMENT=BOTH; STEP-SIZE=1.3			0.8 Secs (0.8 Secs) [==>]	[1]
	2	ACQ/PEAK D (COS.sa.236 4002)	(1) HD-226868	COS/FUV, ACQ/PEAKD, PSA	G160M 1577 A	CENTER=FLUX-W T-FLR; LIFETIME-POS=L P10; NUM-POS=5; SEGMENT=BOTH; STEP-SIZE=0.9			0.8 Secs (0.8 Secs) [==>]	[1]
	3	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=1; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	4	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=2; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	5	G160M/157 7 spect 1 (COS.sp.236 0768)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G160M 1577 A	LIFETIME-POS=LP 10; SEGMENT=BOTH; BUFFER-TIME=71 6; FP-POS=3; FLASH=YES			1200 Secs (350 Secs) [==>350.0 Secs]	[1]
	6	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=1; FLASH=YES			480 Secs (251 Secs) [==>251.0 Secs]	[1]

Proposal 18369 - Visit 05 - Cygnus X-1, unraveling a well-known mystery: HST/COS spectroscopy of the stellar wind in the X-ray bina...

7	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=2; FLASH=YES	480 Secs (798 Secs)	[2]
						[==>798.0 Secs]	
8	G130M/131 8 spect 1 (COS.sp.236 0758)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1318 A	LIFETIME-POS=LP 5; SEGMENT=A; BUFFER-TIME=14 14; FP-POS=3; FLASH=YES	480 Secs (798 Secs)	[2]
						[==>798.0 Secs]	
9	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=1	780 Secs (20 Secs)	[2]
						[==>20.0 Secs]	
10	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=2	780 Secs (1035 Secs)	[3]
						[==>1035.0 Secs]	
11	G130M/109 6 spect 1 (COS.sp.236 0543)	(1) HD-226868	COS/FUV, TIME-TAG, PSA	G130M 1096 A	LIFETIME-POS=LP 7; SEGMENT=BOTH; BUFFER-TIME=39 42; FP-POS=3	780 Secs (1036 Secs)	[3]
						[==>1036.0 Secs]	

Orbit 1

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Orbit 2

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