



17238 - Comprehensive Chandra, Gemini, JVLA and HST observations of a fast blue optical transient

Cycle: 30, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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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	(2) AT2023FHN	WFC3/UVIS	1	31-May-2023 17:00:58.0	yes
02	(2) AT2023FHN	WFC3/UVIS	3	31-May-2023 17:01:00.0	yes

4 Total Orbits Used

ABSTRACT

Fast blue optical transients (FBOTs) are a poorly understood class of extragalactic transient. They are at odds with being radioactively powered due to their rapid rise and fall timescales, and are very blue, indicating a high photospheric temperature. Faint FBOTs are now routinely detected, but bright, local events are rare. Only four were followed up with X-ray, optical spectroscopic, and radio observations in the last four years, of which only two had early time multi-wavelength observations. We propose a ToO joint programme (with Chandra, Gemini, JVLA and HST) to follow-up a

Proposal 17238 (STScI Edit Number: 0, Created: Wednesday, May 31, 2023 at 4:01:01 PM Eastern Standard Time) - Overview
single bright FBOT in detail. Our proposal will help to discern which features all FBOTs have in common, and will put strong constraints on the nature of the central engine and emission mechanisms.

OBSERVING DESCRIPTION

These are target-of-opportunity observations of a new fast blue optical transients, spanning two epochs.

For epoch (visit) 1: one orbit, consisting of a 1100s observation (with 3-point dither) in F555W, and a 1100s observation (with 3-point dither) in F814W. These observations will be triggered as a non-disruptive ToO, to be executed within a few weeks of the initial transient detection. The observations will reach 3 sigma depths of F555W=27.3 and F814W=26.7 (AB).

For epoch (visit) 2: three orbits. All triggered as a non-disruptive ToO, several months after epoch 1.

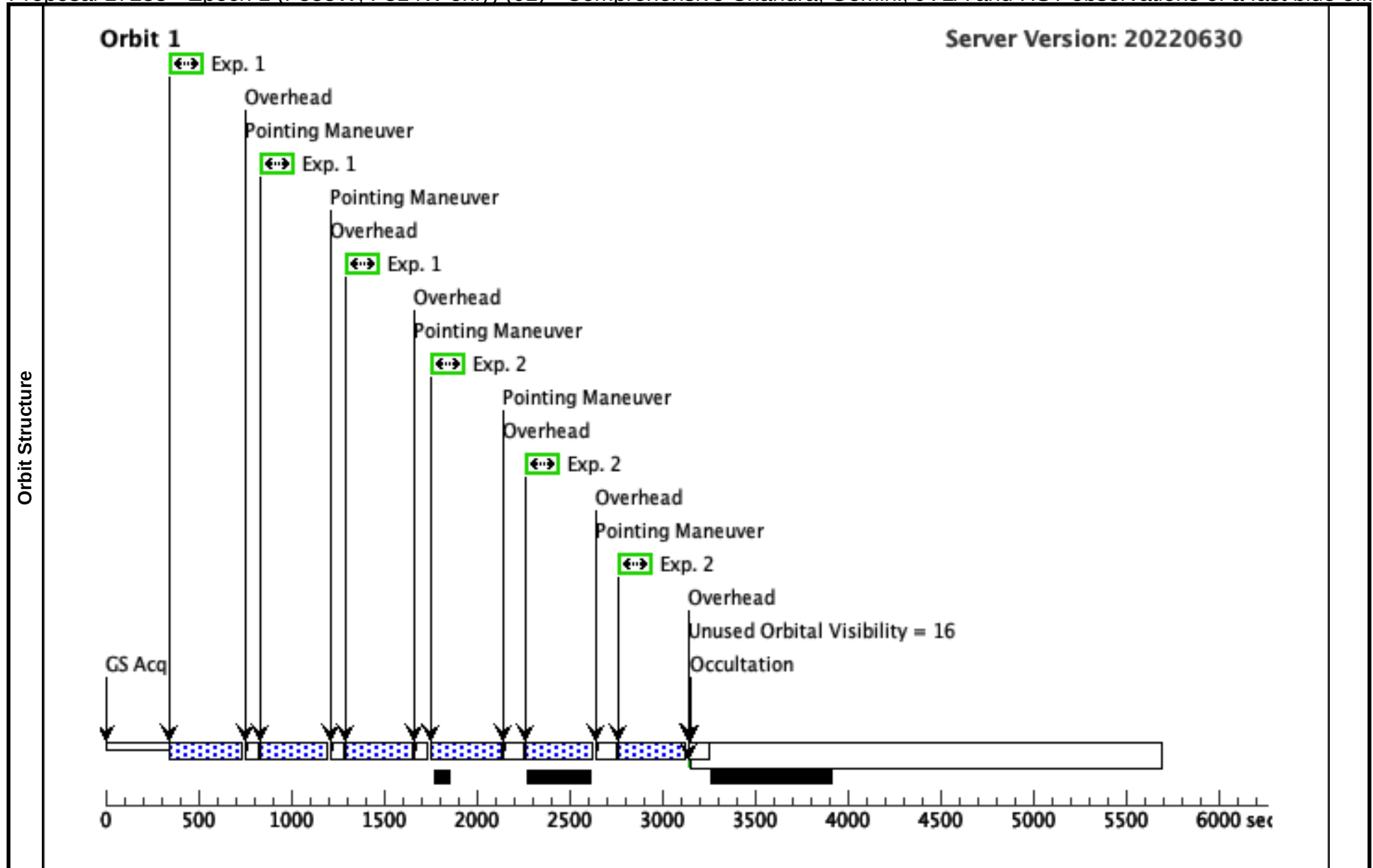
Orbit 1: identical observations to the single orbit of epoch 1, for the purposes of difference imaging and precise transient localisation.

Orbit 2: UV observations in F225W and F336W (1100s each, with 3-point dithers). The depths for these observations will be F225W=25.8 and F336W=26.2. These observations will constrain the presence of high-mass stars at the transient location.

Orbit 3: Observations (again totalling 2200s) with a narrow band, and off-band comparison filter, targeting H α , to measure the equivalent width of H α at the transient location. Because the transient redshift is unknown in advance, we cannot pre-determine the narrow band filter required to capture H α .

Proposal 17238 - Epoch 1 (F555W, F814W only) (01) - Comprehensive Chandra, Gemini, JVL A and HST observations of a fast blue o...

Visit	Proposal 17238, Epoch 1 (F555W, F814W only) (01), completed										Wed May 31 21:01:01 GMT 2023	
	Diagnostic Status: No Diagnostics											
	Scientific Instruments: WFC3/UVIS											
	Special Requirements: ON HOLD ; TOO RESPONSE TIME 25.0D											
	On Hold Comments: Awaiting FBOT trigger											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=					Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false				(1), (2)	
Fixed Targets	#	Name		Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(2)	AT2023FHN		RA: 10 08 3.8150 (152.0158958d)				V=24		Reference Frame: ICRS		
		Alt Name1: ZTF23AAEOZPP		Dec: +21 04 26.95 (21.07415d) Equinox: J2000								
		Alt Name2: ATLAS23HNC										
		Comments: Category=STAR Description=[SUPERNOVA] Extended=NO										
Exposures	#	Label	Target	Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1	Epoch 1 FB OT F555W	(2) AT2023FHN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB		F555W	FLASH=11		Pattern 1, Exps 1-1 i n Epoch 1 (F555W, F814W only) (01) (1)	364 Secs (1092 Secs)		
										[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]		[1]
	2	Epoch 1 FB OT F814W	(2) AT2023FHN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE		F814W	FLASH=11		Pattern 1, Exps 2-2 i n Epoch 1 (F555W, F814W only) (01) (1)	364 Secs (1092 Secs)		
										[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]		[1]

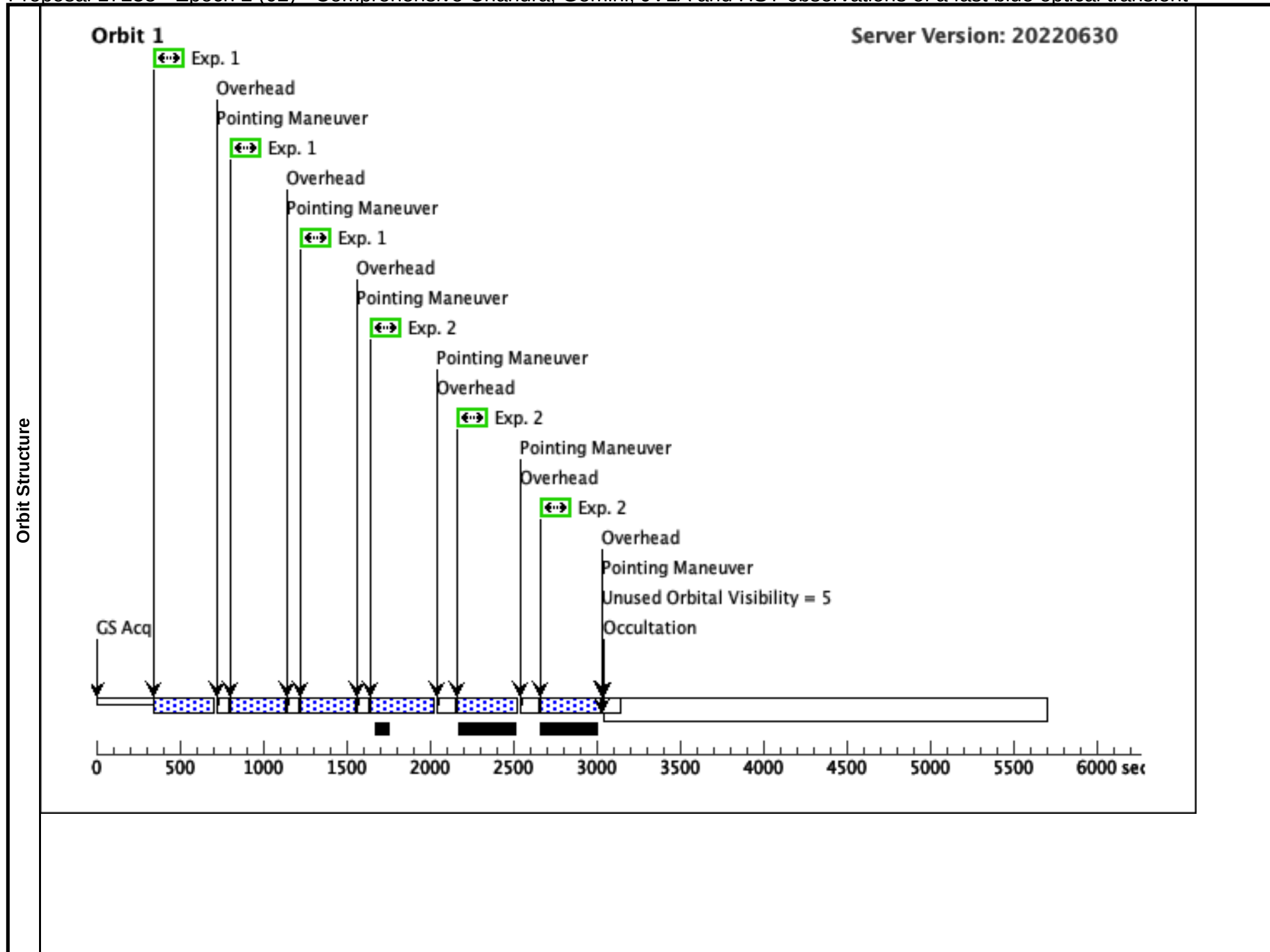


Proposal 17238 - Epoch 2 (02) - Comprehensive Chandra, Gemini, JVL A and HST observations of a fast blue optical transient

Visit	Proposal 17238, Epoch 2 (02), implementation Wed May 31 21:01:01 GMT 2023				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: SCHED 70%; BETWEEN 01-OCT-2023:00:00:00 AND 31-DEC-2023:00:00:00; TOO RESPONSE TIME 25.0D				
Patterns	#	Primary Pattern	Secondary Pattern		Exposures
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2), (3), (4), (5), (6)
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
	(2)	AT2023FHN Alt Name1: ZTF23AAEOZPP Alt Name2: ATLAS23HNC	RA: 10 08 3.8150 (152.0158958d) Dec: +21 04 26.95 (21.07415d) Equinox: J2000		V=24 Reference Frame: ICRS
Comments: Category=STAR Description=[SUPERNOVA] Extended=NO					

Proposal 17238 - Epoch 2 (02) - Comprehensive Chandra, Gemini, JVL A and HST observations of a fast blue optical transient

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	Epoch 2 FB OT F555W	(2) AT2023FHN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F555W	FLASH=11		Pattern 1, Exps 1-1 i n Epoch 2 (02) (1)	330 Secs (990 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)]	[1]
	2	Epoch 2 FB OT F814W	(2) AT2023FHN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F814W	FLASH=11		Pattern 1, Exps 2-2 i n Epoch 2 (02) (1)	364 Secs (1092 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)]	[1]
	3	Epoch 2 FB OT F225W	(2) AT2023FHN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F225W	FLASH=16		Pattern 1, Exps 3-3 i n Epoch 2 (02) (1)	356 Secs (1068 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)]	[2]
	4	Epoch 2 FB OT F336W	(2) AT2023FHN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F336W	FLASH=16		Pattern 1, Exps 4-4 i n Epoch 2 (02) (1)	356 Secs (1068 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)]	[2]
	5	Epoch 2 FB OT Narrow-band (for Ha lpha)	(2) AT2023FHN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F845M	FLASH=14		Pattern 1, Exps 5-5 i n Epoch 2 (02) (1)	330 Secs (990 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)]	[3]
	Comments: Placeholder filter - to updated once the transient redshift is known, to target Halpha.									
	6	Epoch 2 FB OT EW Hal pha compari son filter	(2) AT2023FHN	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F763M	FLASH=13		Pattern 1, Exps 6-6 i n Epoch 2 (02) (1)	356 Secs (1068 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)]	[3]
	Comments: Placeholder filter - to updated once the transient redshift is known, to target Halpha.									



Orbit 2

Server Version: 20220630

GS Reacq

