17236 - Tidal disruption events unveiled: understanding their long-term accretion with Chandra and HST

Cycle: 30, Proposal Category: GO

(Availability Mode: SUPPORTED)

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) AT2019QIZ	WFC3/UVIS	1	07-Feb-2023 11:00:13.0	yes
02	(2) AT2018DYB	WFC3/UVIS	1	07-Feb-2023 11:00:14.0	yes
03	(3) AT2019AHK	WFC3/UVIS	1	07-Feb-2023 11:00:15.0	yes

3 Total Orbits Used

ABSTRACT

Tidal disruption events (TDEs) provide a unique laboratory for studying supermassive black holes. Shortly after disruption, most TDEs are 'veiled': emitting mainly UV/optical while X-ray signs of accretion are obscured. However by >~3 years, the stellar debris should settle into a thin, unobscured disk, brightest in X-rays and UV. We propose to observe 3 very nearby and well-studied TDEs at late phases using Chandra and HST. Only previous 1 TDE (and no veiled TDEs) have high S/N X-ray data at late times. Covering the SED peak with X-ray+UV reveals (1) the evolution of the accretion rate, and whether embedded accretion powered the optical flare; (2) the dominant energy release mechanism in the disk; and (3) fundamental disk parameters such as masses and possibly spin.

OBSERVING DESCRIPTION

We will obtain WFC3/UVIS imaging in F225W of the three closest TDEs to date at phases of >~4 years post-disruption. This is achievable at an SNR~10-30 with one orbit per target. We will simultaneously obtain X-ray observations to measure the UV-X-ray spectral slope.

Visit

Proposal 17236, Visit 01, implementation Tue Feb 07 16:00:15 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	AT2019QIZ	RA: 04 46 37.8800 (71.6578333d) Dec: -10 13 34.92 (-10.22637d) Equinox: J2000		V=20 F225W ~ 23.6	Reference Frame: SIMBAD

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[X-RAY TRANSIENT]
Extended=NO

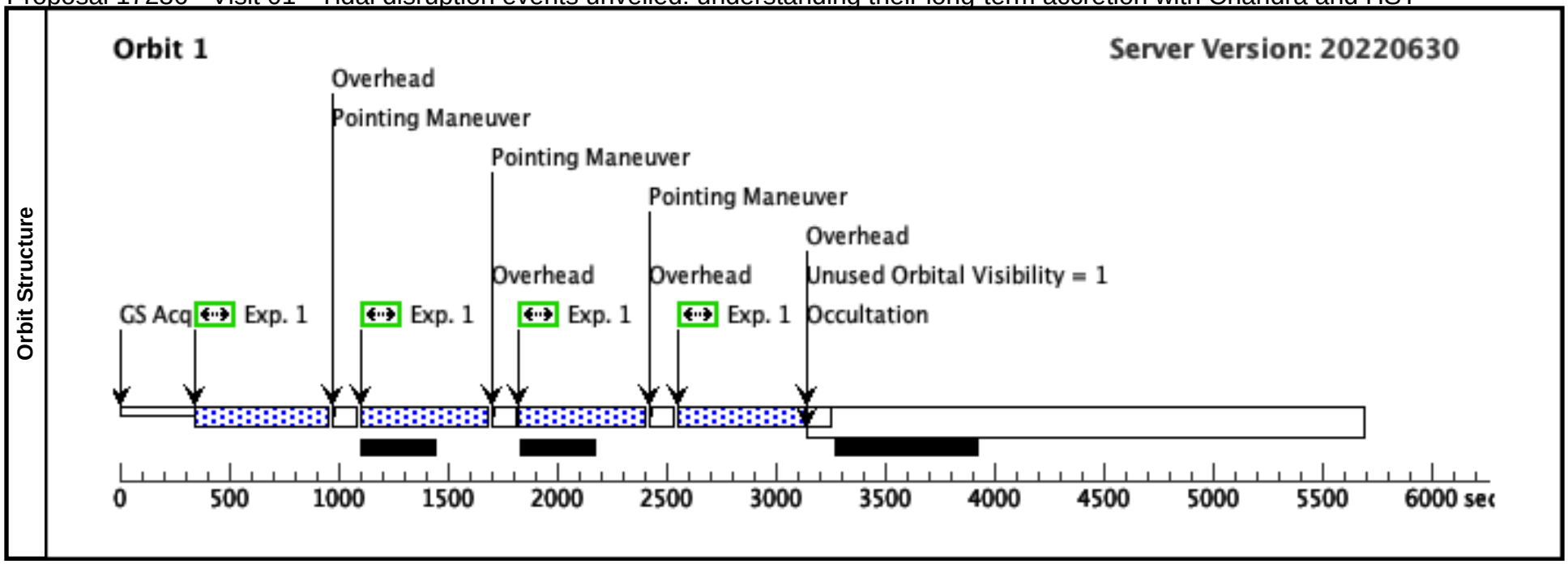
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) AT2019QIZ	WFC3/UVIS, ACCUM, UVIS2	F225W	FLASH=20		Pattern 1, Exps 1-1 in Visit 01 (1)	500 Secs (2340 Secs) *[==>585.0 Secs (Pattern 1)]* *[==>585.0 Secs (Pattern 2)]* *[==>585.0 Secs (Pattern 3)]* *[==>585.0 Secs (Pattern 4)]*	***[1]***

Comments: Questions:

1. Is this the optimal FLASH to use?

2. Targets are at the centers of galaxies ~1 arcmin across. We want to include the whole galaxy in each image as this enables additional science. Is UVIS1 the best location to put the galaxy on the chip?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Orbit 1
Server Version: 20220630
Overhead
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Overhead
Overhead
Overhead
Unused Orbital Visibility = 1
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000 sec

Visit

Proposal 17236, Visit 02, implementation Tue Feb 07 16:00:15 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	AT2018DYB	RA: 16 10 58.7740 (242.7448917d) Dec: -60 55 23.16 (-60.92310d) Equinox: J2000		V=17 F225W ~ 24	Reference Frame: SIMBAD

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[X-RAY TRANSIENT]
Extended=NO

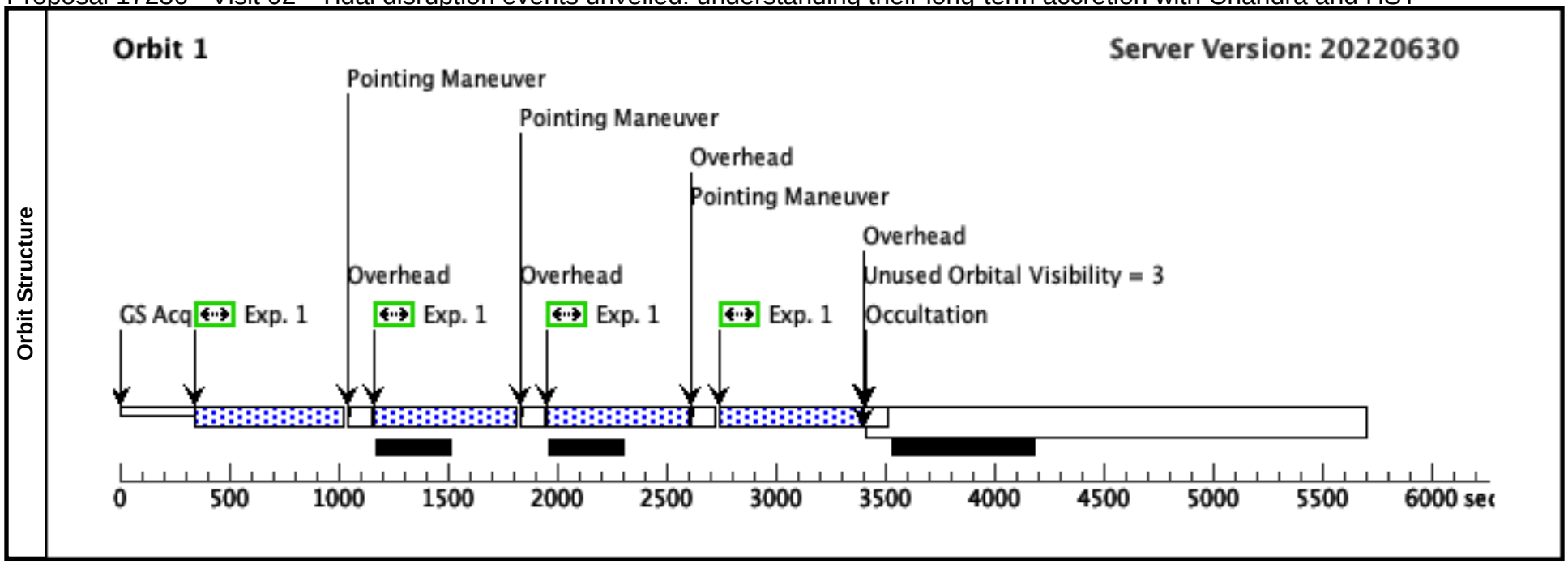
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) AT2018DYB	WFC3/UVIS, ACCUM, UVIS2	F225W	FLASH=20		Pattern 1, Exps 1-1 in Visit 02 (1)	500 Secs (2600 Secs) *[==>650.0 Secs (Pattern 1)]* *[==>650.0 Secs (Pattern 2)]* *[==>650.0 Secs (Pattern 3)]* *[==>650.0 Secs (Pattern 4)]*	***[1]***

Comments: Questions:

1. Is this the optimal FLASH to use?

2. Targets are at the centers of galaxies ~1 arcmin across. We want to include the whole galaxy in each image as this enables additional science. Is UVIS1 the best location to put the galaxy on the chip?


Orbit Structure
Orbit 1
Server Version: 20220630
Pointing Maneuver
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Overhead
Overhead
Unused Orbital Visibility = 3
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Occultation
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Visit

Proposal 17236, Visit 03, implementation Tue Feb 07 16:00:15 GMT 2023

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	AT2019AHK	RA: 07 00 11.4100 (105.0475417d) Dec: -66 02 25.16 (-66.04032d) Equinox: J2000	Epoch of Position: 2015.5	V=16 F225W ~ 24.9	Reference Frame: SIMBAD

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=EXT-STAR
Description=[X-RAY TRANSIENT]
Extended=NO

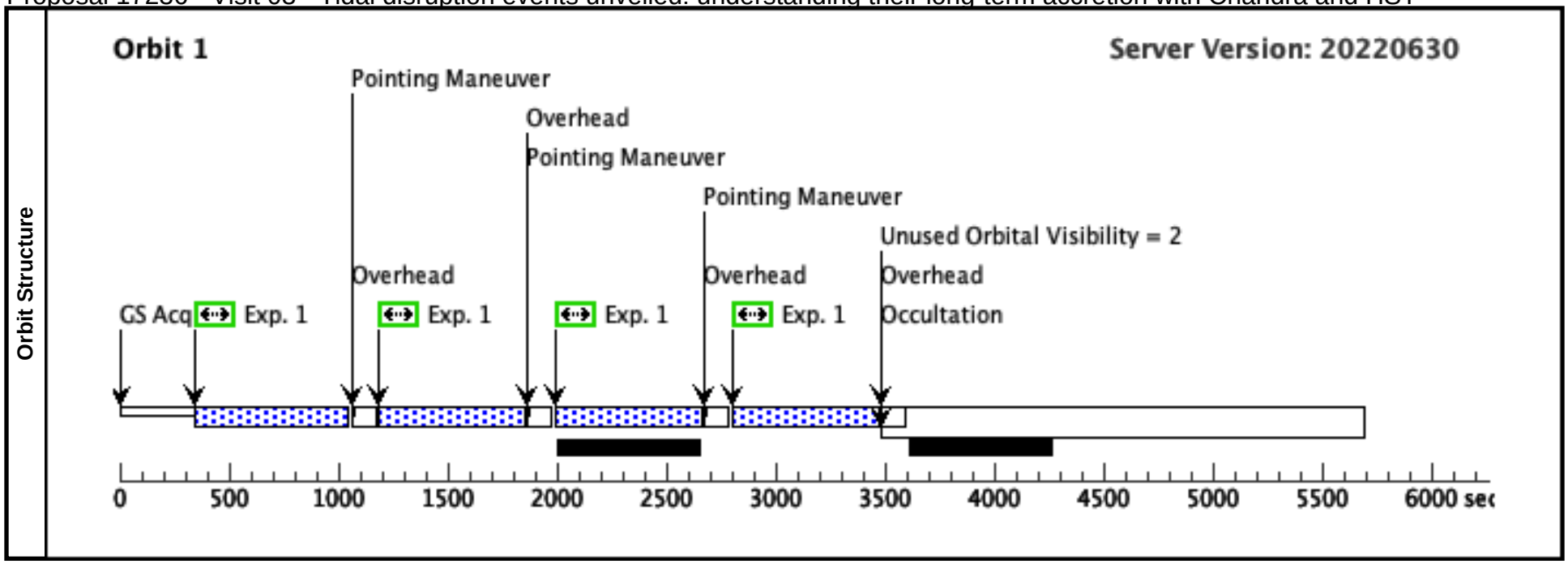
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) AT2019AHK	WFC3/UVIS, ACCUM, UVIS2	F225W	FLASH=20		Pattern 1, Exps 1-1 in Visit 03 (1)	500 Secs (2676 Secs) *[==>669.0 Secs (Pattern 1)]* *[==>669.0 Secs (Pattern 2)]* *[==>669.0 Secs (Pattern 3)]* *[==>669.0 Secs (Pattern 4)]*	***[1]***

Comments: Questions:

1. Is this the optimal FLASH to use?

2. Targets are at the centers of galaxies ~1 arcmin across. We want to include the whole galaxy in each image as this enables additional science. Is UVIS1 the best location to put the galaxy on the chip?


Orbit Structure
Orbit 1
Server Version: 20220630
Pointing Maneuver
Overhead
Pointing Maneuver
Pointing Maneuver
Unused Orbital Visibility = 2
Overhead
Overhead
Overhead
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Occultation
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