18054 - Are 3XMM J2150 and EP240222a really off-nuclear tidal disruption events?

Cycle: 33, 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) 3XMMJ215	WFC3/UVIS	1	02-Oct-2025 09:00:13.0	yes
02	(2) EP240222A	WFC3/UVIS	2	02-Oct-2025 09:00:13.0	yes

3 Total Orbits Used

ABSTRACT

Galaxy merger simulations predict a substantial population of off-nuclear massive black holes (MBHs). Tidal disruption events (TDEs) occurring around these wandering MBHs provide a rare window into studying these otherwise dormant black holes. Recently, AT 2024tvd was confirmed as the first optically selected off-nuclear TDE. Two other X-ray selected events have also been put forward as off-nuclear TDE candidates: 3XMM J2150 and EP240222a. However, their separation from the purported host galaxy is large (13 and 35 kpc, respectively). It is not clear that the two MBHs are even linked to the larger "host galaxy". Therefore, we request deep HST imaging of these 2 off-nuclear TDE candidates to 1) detect signatures of faint satellite galaxies that might host these TDEs, ii) detect UV emission from the TDe accretion disks. These deep and high spatial resolution images will help answer whether these are indeed off-nuclear MBHs like AT 2024tvd.

OBSERVING DESCRIPTION

We will obtain imaging with WFC3/UVIS of 2 off-nuclear tidal disruption event candidates:

Visit 1) 3XMMJ215: F225W (1 orbit)

Visit 2) EP240222A: F225W (1 orbit) + F625W (1 orbit)

Visit

Proposal 18054, 3XMMJ215 (01), implementation Thu Oct 02 13:00:14 GMT 2025

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

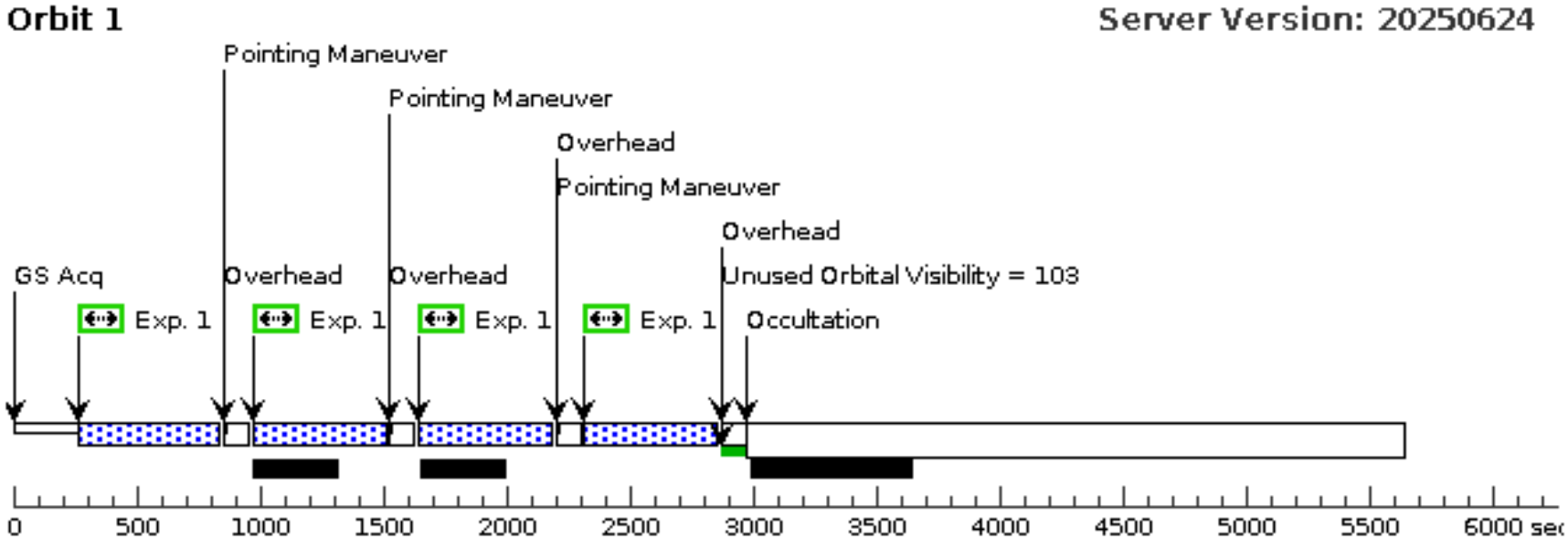
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	3XMMJ215	RA: 21 50 22.4000 (327.5933333d) Dec: -05 51 8.00 (-5.85222d) Equinox: J2000	Epoch of Position: 2000 Redshift: 0.055	V=23	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[ACCRETION DISK, ELLIPTICAL, TIDAL TAIL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	3XMMJ215; F225W	(1) 3XMMJ215	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F225W	FLASH=21	GS ACQ SCENARIO ONEB1OR	Pattern 1, Exps 1-1 in 3XMMJ215 (01) (1)	500 Secs (2172 Secs) *[==>543.0 Secs (Pattern 1)]* *[==>543.0 Secs (Pattern 2)]* *[==>543.0 Secs (Pattern 3)]* *[==>543.0 Secs (Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 18054, EP240222A (02), implementation Thu Oct 02 13:00:14 GMT 2025

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		(1-2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	EP240222A	RA: 11 32 4.3204 (173.0180017d) Dec: +27 00 17.60 (27.00489d) Equinox: J2000	Redshift: 0.03275	V=24	Reference Frame: ICRS

Comments:
Category=GALAXY
Description=[ACCRETION DISK, ELLIPTICAL, TIDAL TAIL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	EP240222A; F225W	(2) EP240222A	WFC3/UVIS, ACCUM, UVIS1	F225W	FLASH=21	GS ACQ SCENARIO ONEB1OR	Pattern 1, Exps 1-2 in EP240222A (02) (1)	500 Secs (2098 Secs)	
								[==>527.0 Secs (Pattern 1)] *[==>527.0 Secs (Pattern 2)]*	***[1]***
								[==>522.0 Secs (Pattern 3)] *[==>522.0 Secs (Pattern 4)]*	***[2]***
2	EP240222A; F625W	(2) EP240222A	WFC3/UVIS, ACCUM, UVIS1	F625W	FLASH=8		Pattern 1, Exps 1-2 in EP240222A (02) (1)	500 Secs (2098 Secs)	
								[==>527.0 Secs (Pattern 1)] *[==>527.0 Secs (Pattern 2)]*	***[1]***
								[==>522.0 Secs (Pattern 3)] *[==>522.0 Secs (Pattern 4)]*	***[2]***

Orbit Structure