



17144 - Confirming the Formation of Black Holes

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) NGC6946-BH1	WFC3/IR	1	05-Oct-2022 10:00:17.0	yes
02	(3) M101-OC1	WFC3/IR WFC3/UVIS	1	05-Oct-2022 10:00:17.0	yes

2 Total Orbits Used

ABSTRACT

There are good observational and theoretical reasons to believe that 10-30% of the core-collapses of massive stars lead to the formation of black holes without a supernova explosion. A survey using the Large Binocular Telescope has identified one good candidate in NGC6946 and new candidate in M101. In N6946, a roughly 300,000 Lsun star vanished in the optical to leave a fading, few 1000 Lsun near-IR (HST F110W/F160W in 2015/2017) source. It is very difficult to reconcile the evolution with a dust enshrouded, but surviving, star. A new epoch of HST near-IR observations to

confirm the continued fading will greatly strengthen this argument. The new candidate needs to be characterized to establish a baseline from which to evaluate its future evolution and status. Because of the low fluxes and crowding, good photometry can no longer be obtained from the ground.

OBSERVING DESCRIPTION

The goal is WF3/IR F160W and F110W observations of one target and WF3/IR/F160W and WF3/UVIS/F814W observations of the other.

Three dither positions will be used for each observation to control CRs and hot pixels. Experiments to try to get 4 UVIS images for better CR control were not successful due to buffer dumps.

The multiaccum read was chosen to leave as close to no left over time as possible.

The APT is warning about low background counts for CTE, but the image is on top of the nearby galaxy M101, so the background is much higher than for an extragalactic field (particularly given the filter)

Other than scheduling, these observations should not be impacted by the loss of a gyroscope. From the visit planner results, it appears, however, that these observations have a lot of observing windows.

Proposal 17144 - Visit 01 - Confirming the Formation of Black Holes

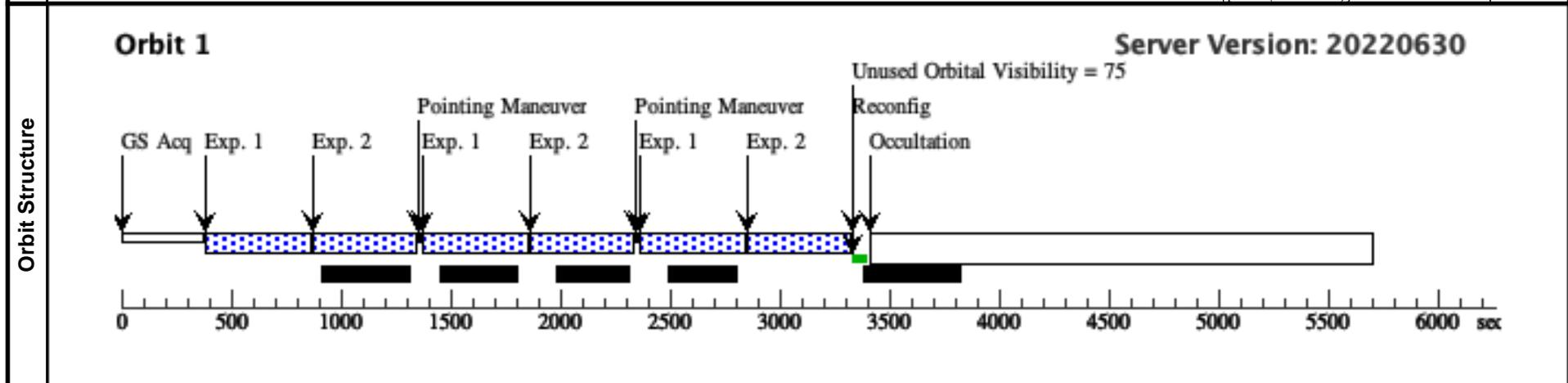
Wed Oct 05 14:00:18 GMT 2022

Visit	Proposal 17144, Visit 01, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: (none)		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(1)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false	

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	NGC6946-BH1	RA: 20 35 27.5600 (308.8648333d) Dec: +60 08 8.29 (60.13564d) Equinox: J2000		V=25	Reference Frame: ICRS
<i>Comments:</i> Category=EXT-STAR Description=[UNDESIGNATED] Extended=NO						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(2) NGC6946-BH1	WFC3/IR, MULTIACCUM, IR	F110W	NSAMP=14; SAMP-SEQ=STEP5 0			Pattern 1, Exps 1-2 in Visit 01 (1)	449.233834 Secs (1347.702 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)]
2		(2) NGC6946-BH1	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=14; SAMP-SEQ=STEP5 0			Pattern 1, Exps 1-2 in Visit 01 (1)	449.233834 Secs (1347.702 Secs) [=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)]	[1]



Proposal 17144 - Visit 02 - Confirming the Formation of Black Holes

Wed Oct 05 14:00:18 GMT 2022

Visit	Proposal 17144, Visit 02, implementation Diagnostic Status: Warning Scientific Instruments: WFC3/IR, WFC3/UVIS Special Requirements: ORIENT 210D TO 270 D									
	(Exposure 2 (Pattern 2, Exps 2-2 in Visit 02)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser									
Diagnosics										
Patterns	#	Primary Pattern	Secondary Pattern	Exposures						
	(1)	Pattern Type=WFC3-IR-DITHER- LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1)					
Patterns	(2)	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		(2)					
	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
Fixed Targets	(3)	M101-OC1	RA: 14 03 17.2400 (210.8218333d) Dec: +54 22 7.60 (54.36878d) Equinox: J2000		V=25	Reference Frame: ICRS				
	<i>Comments:</i> Category=EXT-STAR Description=[UNDESIGNATED] Extended=NO									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(3) M101-OC1		WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=14; SAMP-SEQ=STEP5 0	POS TARG -35,-45	Pattern 1, Exps 1-1 i n Visit 02 (1)	449.233834 Secs (1347.702 Secs)	
Exposures									[=>(Pattern 1)]	
									[=>(Pattern 2)]	[1]
									[=>(Pattern 3)]	
2	(3) M101-OC1		WFC3/UVIS, ACCUM, UVIS2-C512C-CTE	F814W				Pattern 2, Exps 2-2 i n Visit 02 (2)	350 Secs (1071 Secs)	
									[=>357.0 Secs (Pattern 1)]	
									[=>357.0 Secs (Pattern 2)]	[1]
									[=>357.0 Secs (Pattern 3)]	

