



14715 - Watching AGN feedback at its birth: HST observations of nascent outflow host IC860

Cycle: 24, Proposal Category: GO
(Availability Mode: SUPPORTED)

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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	(1) IC-0860	WFC3/IR WFC3/UVIS	3	07-Sep-2016 18:17:01.0	yes
02	(1) IC-0860	WFC3/IR WFC3/UVIS	1	07-Sep-2016 18:17:02.0	yes

4 Total Orbits Used

ABSTRACT

IC860 is a nearby IR-luminous early-type spiral with a unique set of properties: it is a shocked, poststarburst galaxy that hosts an AGN-driven neutral wind and a compact core of molecular gas. IC860 can serve as a rosetta stone for the early stages of triggering AGN feedback. We propose to use WFC3 on HST to obtain NUV, optical and near-IR imaging of IC860. We will create a spatially-resolved history of star formation quenching through SED-fitting of 7 requested broadband filters, and compare the spatially resolved star formation histories to in different positions within the underlying stellar features (such as spiral structure) that might define a narrative of how star formation is quenching in IC860. These observations will also resolve the super-star cluster sites to trace the most recent star formation. Finally, these observations will trace the mass of the outflow by building an absorption map of the dust. IC860 presents a unique opportunity to study a galaxy at an early stage of transitioning from blue spiral to red early-type galaxy, that also hosts an AGN-driven neutral wind and a compact, turbulent molecular gas core.

OBSERVING DESCRIPTION

We propose to obtain deep, high resolution NUV, optical, and near-IR imaging of IC 860. The multi-band imaging will allow us to map the stellar morphology of the galaxy, as well as the de- tailed dust distribution both in the center of the galaxy and out near one effective radius, with resolution of at least 0.200 (50pc), and a field-of-view of 10000, which is able to image IC860 in a single pointing (see Fig. 3). All exposures are dithered to avoid bad/hot pixels, skip over the "blobs," and minimize persistence. This proposal requests a total of 4 orbits.

Basic data for IC 860:

GALEX NUV: 18.35 AB mag SDSS u0: 15.682 mag

SDSS g: 14.024 mag

SDSS r: 13.355 mag

SDSS i: 12.774 mag

J20 2MASS: 11.671 mag H20 2MASS: 10.923 mag K20 2MASS: 10.683 mag

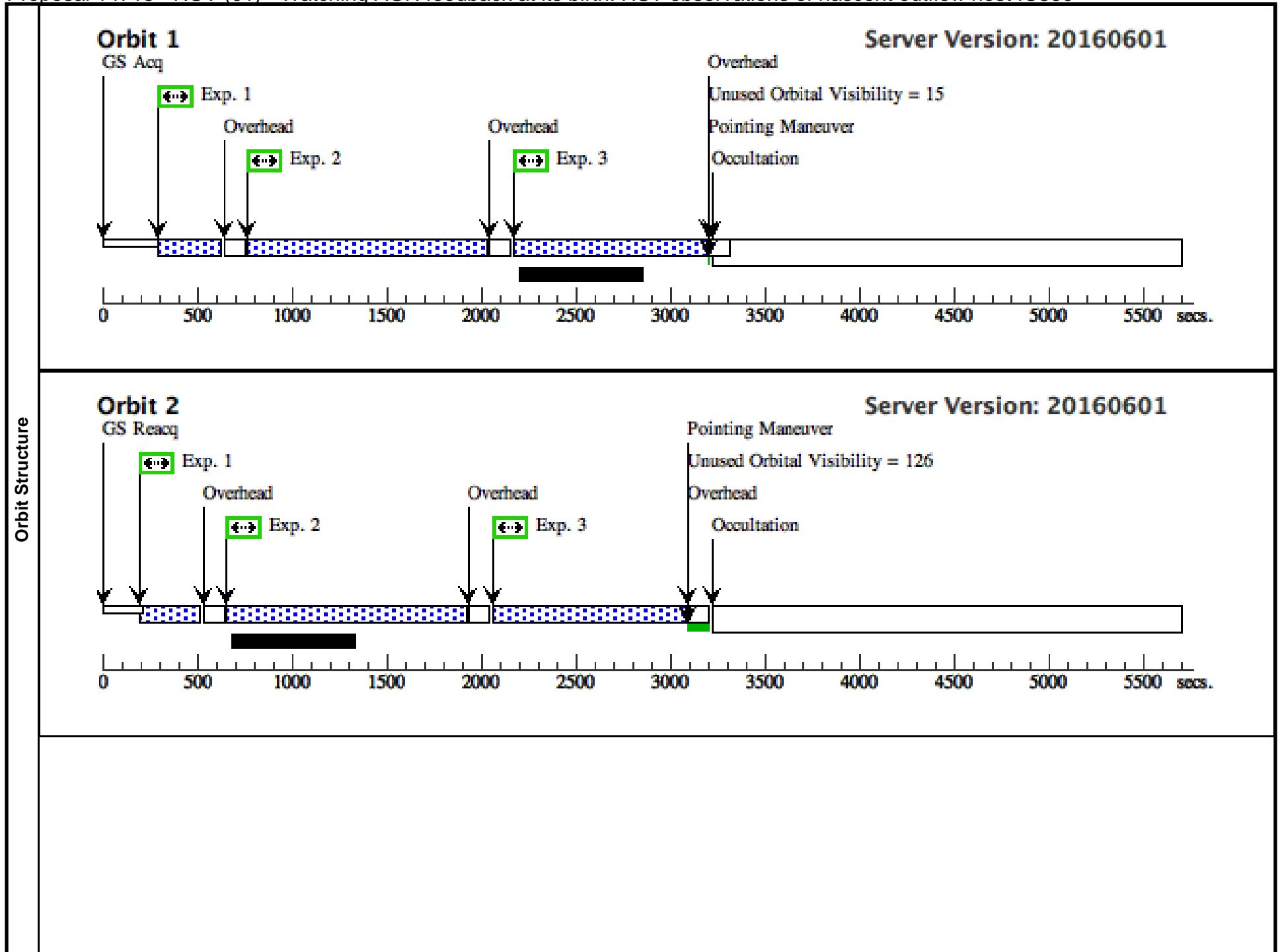
The near UV image uses the WFC3 UVIS channel with the F275W filter, with which we can detect the presence of young, hot stars. We estimate the time to obtain a S/N~10 per PSF based on the GALEX NUV photometry. If the NUV flux is smoothly distributed, then 5000 seconds is required to achieve the minimum S/N. However, if the NUV flux is produced in clumps then the S/N in the same exposure time will be higher. This will map the presence of young stars at ~20 pc resolution to high significance (assuming WFC3/NUV resolution of 0.0800). The orbit will be split into at least four dithered sub-exposures to facilitate cosmic ray subtraction and to remove hot pixels or bad columns and avoid the effect of the droplets, and will use FLASH to raise the background to 12-15 e/pix. The resulting NUV image will locate regions with recent star formation within the galaxy. 2 orbits for the NUV image.

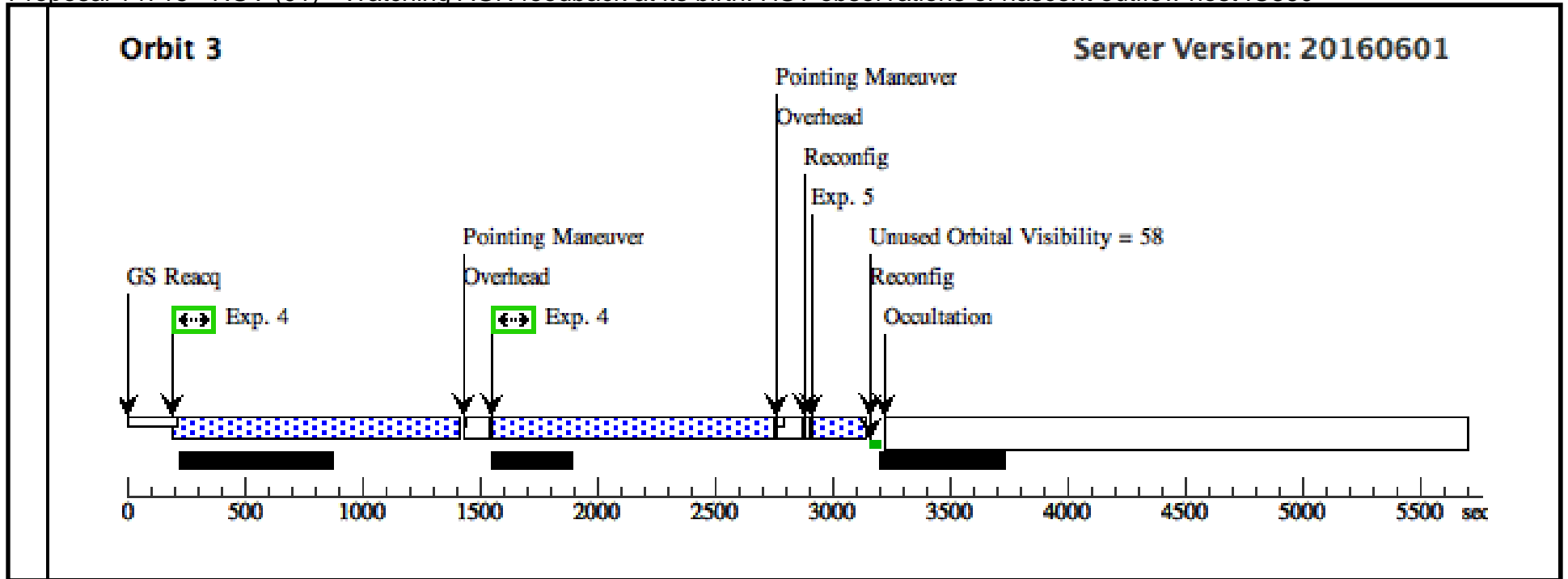
We derived exposure times assuming a flux density using the 3000-4000 spectrum from Moustakas & Kennicutt (2006) of 10^{17} ergs s⁻¹ cm⁻² Å⁻¹ sq. arcsec⁻¹. We request one orbit using the WFC3/UVIS F336W (U) filter, then one orbit will be split between WFC3/UVIS F438W (B), F606W (V), and F814W (I) and WFC3/IR F140W (J) and F160W (H) filters. The exposure time will be divided between them so as to achieve roughly equal S/N per pixel in each filter. Exposures of 2000 seconds in F336W, 500 seconds in F438W, 350 seconds in F606W, and 500 seconds in F814W, and ~300 seconds (the minimum exposure, for the same reasons given above) for F140W and F160W, will produce a S/N~20 per pixel in each of the filters. 1 orbit for WFC3/UVIS U

Proposal 14715 - NUV (01) - Watching AGN feedback at its birth: HST observations of nascent outflow host IC860

Wed Sep 07 22:17:03 GMT 2016

Visit	Proposal 14715, NUV (01), implementation Diagnostic Status: Warning Scientific Instruments: WFC3/IR, WFC3/UVIS Special Requirements: (none)										
	(F275W 3 (01.004) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes										
Diagnosics											
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(4)	Pattern Type=WFC3-UVIS-GAP-LINE Coordinate Frame=POS-TARG Purpose=MOSAIC Pattern Orientation=85.759 Number Of Points=2 Angle Between Sides= Point Spacing=2.414 Center Pattern=true Line Spacing=								(1-3), (4)	
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections		Fluxes	Miscellaneous		
	(1)	IC-0860	RA: 13 15 3.5280 (198.7647000d) Dec: +24 37 7.93 (24.61887d) Equinox: J2000					V=14.024	Reference Frame: NED		
Comments: This object was generated by the targetselector and retrieved from the NED database. Extended=YES											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1	F438W 1	(1) IC-0860	WFC3/UVIS, ACCUM, UVIS2	F438W	FLASH=11		Pattern 4, Exps 1-3 in NUV (01) (4)	300 Secs (600 Secs)		
										[==>(Pattern 1)]	[1]
										[==>(Pattern 2)]	[2]
	2	F275W 1	(1) IC-0860	WFC3/UVIS, ACCUM, UVIS2	F275W	FLASH=11.0		Pattern 4, Exps 1-3 in NUV (01) (4)	1250 Secs (2500 Secs)		
										[==>(Pattern 1)]	[1]
										[==>(Pattern 2)]	[2]
	3	F336W 1	(1) IC-0860	WFC3/UVIS, ACCUM, UVIS2	F336W	FLASH=9		Pattern 4, Exps 1-3 in NUV (01) (4)	1000 Secs (2000 Secs)		
										[==>(Pattern 1)]	[1]
										[==>(Pattern 2)]	[2]
4	F275W 3	(1) IC-0860	WFC3/UVIS, ACCUM, UVIS2	F275W	FLASH=11.0	POS TARG -0.05,+0 .1		Pattern 4, Exps 4-4 in NUV (01) (4)	1200 Secs (2400 Secs)		
									[==>(Pattern 1)]	[3]	
									[==>(Pattern 2)]	[3]	
5	F140W 1	(1) IC-0860	WFC3/IR, MULTIACCUM, IR-FIX	F140W	NSAMP=9; SAMP-SEQ=SPAR S25		POS TARG -2.17,-1.945		202.936411 Secs (202.936 Secs)		
									[==>]	[3]	





Proposal 14715 - Vis+IR (02) - Watching AGN feedback at its birth: HST observations of nascent outflow host IC860

Wed Sep 07 22:17:03 GMT 2016

Visit	Proposal 14715, Vis+IR (02), implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, WFC3/UVIS Special Requirements: (none)									
	#	Primary Pattern	Secondary Pattern	Exposures						
Patterns	(4)	Pattern Type=WFC3-UVIS-GAP-LINE Purpose=MOSAIC Number Of Points=2 Point Spacing=2.414 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.759 Angle Between Sides= Center Pattern=true	(3), (4)						
	(5)	Pattern Type=WFC3-IR-DITHER-BLOB Purpose=DITHER Number Of Points=2 Point Spacing=5.183 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.859 Angle Between Sides= Center Pattern=true	(2)						
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	IC-0860	RA: 13 15 3.5280 (198.7647000d) Dec: +24 37 7.93 (24.61887d) Equinox: J2000		V=14.024	Reference Frame: NED				
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i> Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F140W 2	(1) IC-0860	WFC3/IR, MULTIACCUM, IR-FIX	F140W	NSAMP=9;	POS TARG 2.17,1.9		202.936411 Secs (202.936 Secs)	
						SAMP-SEQ=SPAR	45		[==>]	[1]
	2	F160W 1	(1) IC-0860	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=9;		Pattern 5, Exps 2-2 i	202.936411 Secs (405.873 Secs)	
						SAMP-SEQ=SPAR		n Vis+IR (02) (5)	[==>(Pattern 1)]	[1]
					S25			[==>(Pattern 2)]		
3	F606W 1	(1) IC-0860	WFC3/UVIS, ACCUM, UVIS2	F606W			Pattern 4, Exps 3-3 i	400 Secs (800 Secs)		
							n Vis+IR (02) (4)	[==>(Pattern 1)]	[1]	
								[==>(Pattern 2)]		
4	F814W 1	(1) IC-0860	WFC3/UVIS, ACCUM, UVIS2	F814W	FLASH=6		Pattern 4, Exps 4-4 i	375 Secs (750 Secs)		
							n Vis+IR (02) (4)	[==>(Pattern 1)]	[1]	
								[==>(Pattern 2)]		

