



15990 - Determining How X-ray Binary Populations Vary Through Time

Cycle: 27, 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) NGC-2336-NORTH	ACS/WFC	3	22-Nov-2019 15:00:48.0	yes

<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>
02	(3) NGC-2336-SOUTH	ACS/WFC	3	22-Nov-2019 15:00:50.0	yes
03	(1) NGC-2336-CENTER	ACS/WFC	3	22-Nov-2019 15:00:52.0	yes

9 Total Orbits Used

ABSTRACT

We propose 200 ks total ACIS-S observations of the spiral galaxy NGC 2336, one of the most actively star-forming galaxies in the local Universe. The proposed observations will reach $L_x \sim 7 \times 10^{37}$ erg/s, yielding over 40 high-mass X-ray binaries (XRBs). Archival UV data and supporting Hubble Space Telescope observations fully leverage our proposed Chandra observations by allowing us to: (a) measure the age and metallicity distribution of young XRBs; (b) measure the formation efficiency of young XRBs as a function of the age of their parent stellar populations; (c) constrain XRB formation models; (d) characterize the ultra-luminous XRB population; (e) explore the role of star formation in energizing the ISM; and (f) identify the nature of the nuclear source.

OBSERVING DESCRIPTION

The goal of this proposal is to study the star-cluster population in our nearby spiral galaxy NGC2336, and their connection with its X-ray binary population. For this reason we will obtain observations in the F345W, F555W, and F816W filters with the ACS-WFC.

In order to maximize the coverage of the galaxy we have defined 3 fields: one in the center, one in the north, and one in the south of the galaxy. The positions of the targets are selected so there is at least 1/2 ACS field coverage in order to increase the depth of the observations, especially in the central parts of the galaxy. Also in order to ensure maximal and uniform coverage we wish the observations we have set a ROLL constraint, and we wish all 3 visits to have the same ROLL.

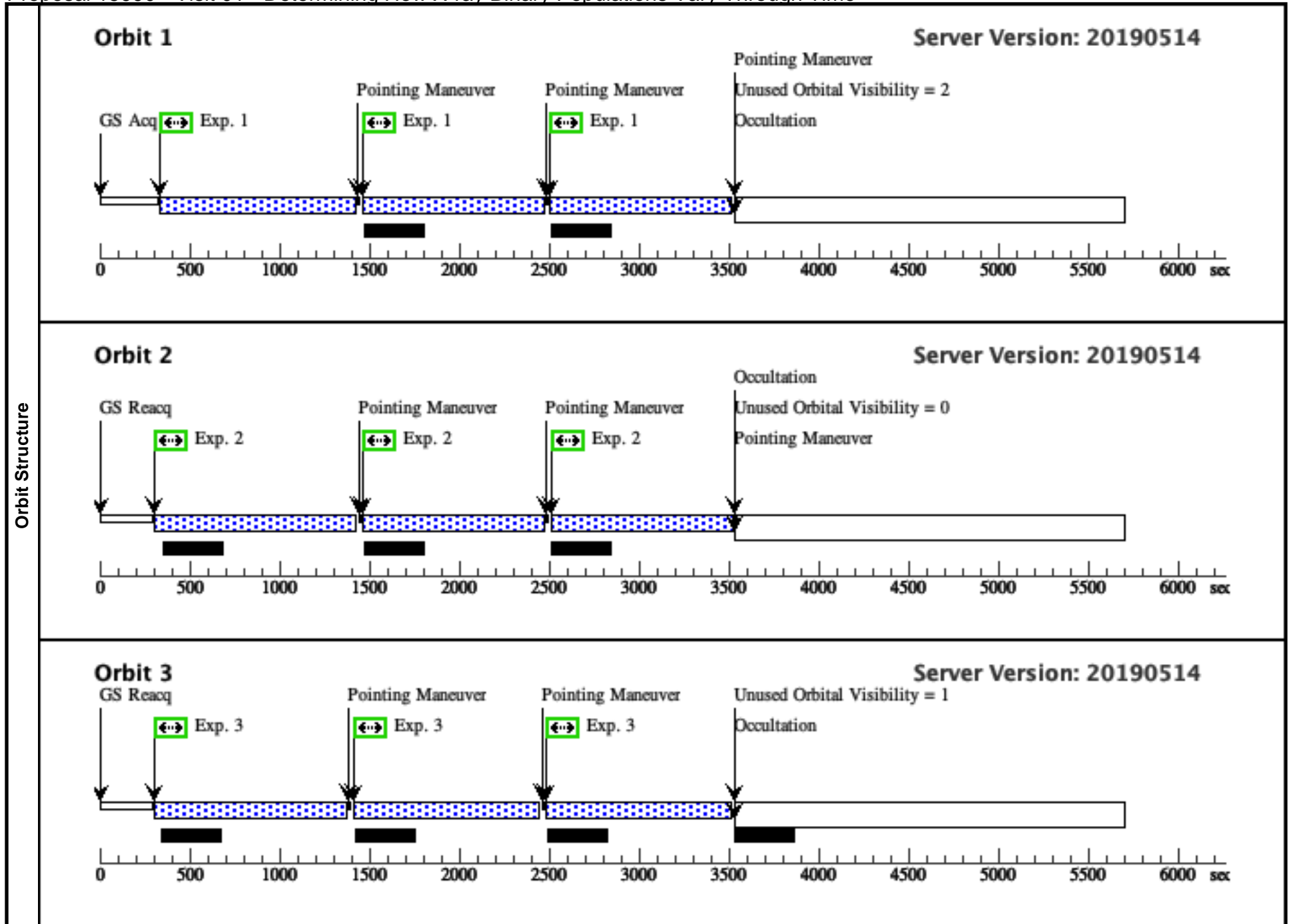
The observations will be taken with a 3point line dither pattern in order to reject cosmic rays and hot pixels and cover the chip gap. The additional coverage provided by the overlapping fields will help to reduce the noise on the chip gap regions in the final mosaics.

The total exposure time in each field is 2655 sec, 2722 sec, and 2730 sec for filters F435W, F555W, and F814W, respectively. This will enable us to detect star-clusters as faint as 25 mag with a SNR at least 30, allowing us to derive reliable stellar population parameters.

Proposal 15990 - Visit 01 - Determining How X-ray Binary Populations Vary Through Time

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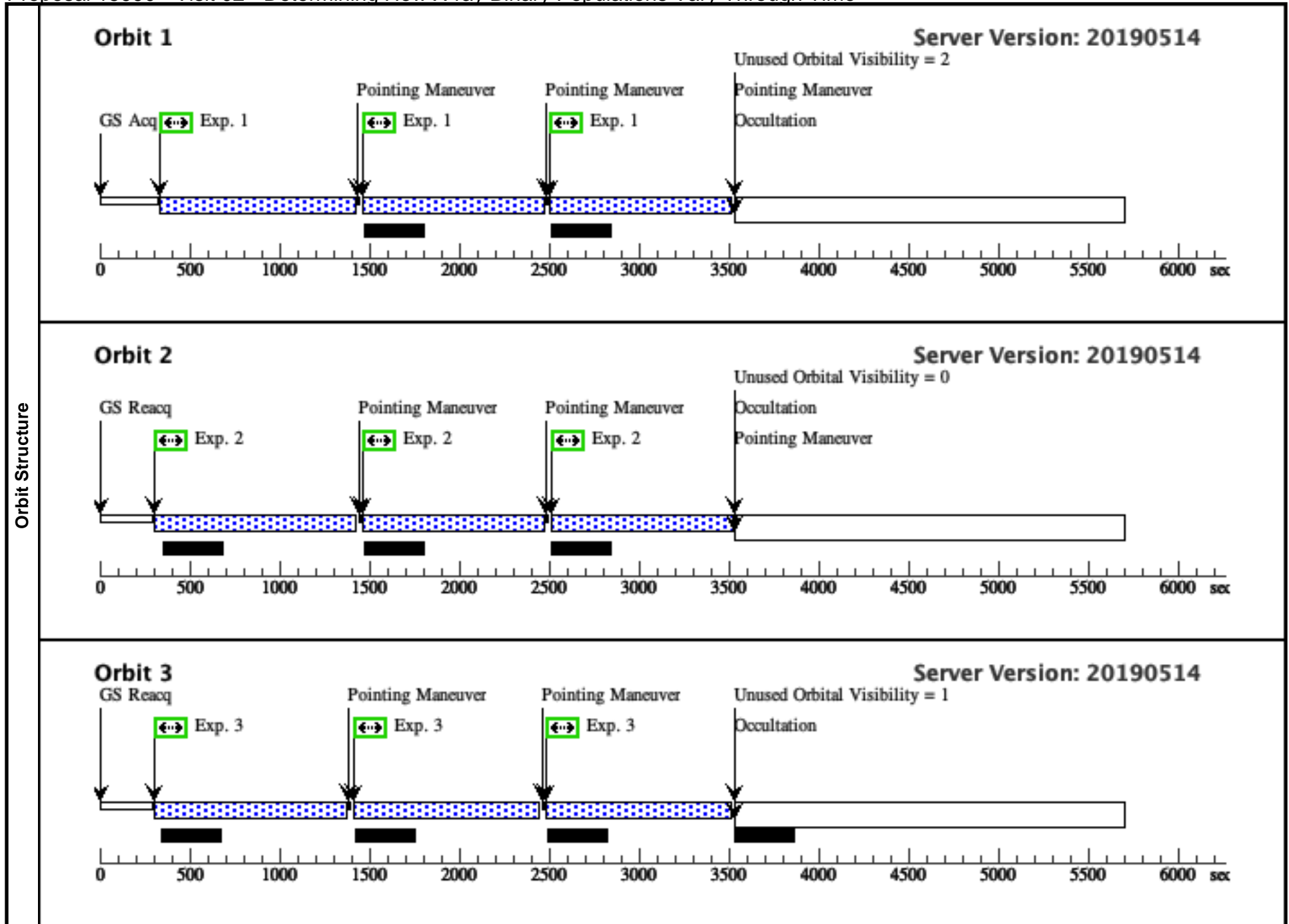
Visit	Proposal 15990, Visit 01, implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: ORIENT 345D TO 15 D; ORIENT 155D TO 195 D; ORIENT 75D TO 105 D; ORIENT 255D TO 285 D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2), (3)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	NGC-2336-NORTH	RA: 07 27 3.3257 (111.7638571d) Dec: +80 12 3.65 (80.20101d) Equinox: J2000	Epoch of Position: 2015.5	V=12.51	Reference Frame: SIMBAD				
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=GALAXY Description=[SPIRAL, SPIRAL ARM, STAR FORMING REGION]										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(2) NGC-2336-NORTH	ACS/WFC, ACCUM, WFCENTER	F435W			Pattern 1, Exps 1-1 in Visit 01 (1)	300 Secs (2655 Secs)	
									[=>885.0 Secs (Pattern 1)] [=>885.0 Secs (Pattern 2)] [=>885.0 Secs (Pattern 3)]	[1]
	2		(2) NGC-2336-NORTH	ACS/WFC, ACCUM, WFCENTER	F555W			Pattern 1, Exps 2-2 in Visit 01 (1)	300 Secs (2722 Secs)	
								[=>952.0 Secs (Pattern 1)] [=>885.0 Secs (Pattern 2)] [=>885.0 Secs (Pattern 3)]	[2]	
3		(2) NGC-2336-NORTH	ACS/WFC, ACCUM, WFCENTER	F814W				Pattern 1, Exps 3-3 in Visit 01 (1)	300 Secs (2730 Secs)	
								[=>910.0 Secs (Pattern 1)] [=>910.0 Secs (Pattern 2)] [=>910.0 Secs (Pattern 3)]	[3]	



Proposal 15990 - Visit 02 - Determining How X-ray Binary Populations Vary Through Time

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Visit	Proposal 15990, Visit 02, implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: SAME ORIENT AS 01									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2), (3)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(3)	NGC-2336-SOUTH	RA: 07 27 4.1836 (111.7674317d) Dec: +80 08 56.70 (80.14908d) Equinox: J2000	Epoch of Position: 2015.5	V=12.51	Reference Frame: SIMBAD				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=GALAXY Description=[SPIRAL, SPIRAL ARM, STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(3) NGC-2336-SOUTH	ACS/WFC, ACCUM, WFCENTER	F435W			Pattern 1, Exps 1-1 in Visit 02 (1)	300 Secs (2655 Secs)	
			TH						[==>885.0 Secs (Pattern 1)] [==>885.0 Secs (Pattern 2)] [==>885.0 Secs (Pattern 3)]	[1]
	2		(3) NGC-2336-SOUTH	ACS/WFC, ACCUM, WFCENTER	F555W			Pattern 1, Exps 2-2 in Visit 02 (1)	300 Secs (2722 Secs)	
		TH						[==>952.0 Secs (Pattern 1)] [==>885.0 Secs (Pattern 2)] [==>885.0 Secs (Pattern 3)]	[2]	
3		(3) NGC-2336-SOUTH	ACS/WFC, ACCUM, WFCENTER	F814W				Pattern 1, Exps 3-3 in Visit 02 (1)	300 Secs (2730 Secs)	
		TH						[==>910.0 Secs (Pattern 1)] [==>910.0 Secs (Pattern 2)] [==>910.0 Secs (Pattern 3)]	[3]	



Proposal 15990 - Visit 03 - Determining How X-ray Binary Populations Vary Through Time

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Visit	Proposal 15990, Visit 03, implementation Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: SAME ORIENT AS 01									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2), (3)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	NGC-2336-CENTER	RA: 07 27 3.6561 (111.7652338d) Dec: +80 10 41.00 (80.17806d) Equinox: J2000	Epoch of Position: 2015.5	V=12.51	Reference Frame: SIMBAD				
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=GALAXY Description=[NUCLEUS, SPIRAL, STAR FORMING REGION]										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) NGC-2336-CENTER	ACS/WFC, ACCUM, WFC-FIX	F435W			Pattern 1, Exps 1-1 in Visit 03 (1)	300 Secs (2655 Secs)	
									[=>885.0 Secs (Pattern 1)] [=>885.0 Secs (Pattern 2)] [=>885.0 Secs (Pattern 3)]	[1]
	2		(1) NGC-2336-CENTER	ACS/WFC, ACCUM, WFC-FIX	F555W			Pattern 1, Exps 2-2 in Visit 03 (1)	300 Secs (2722 Secs)	
								[=>952.0 Secs (Pattern 1)] [=>885.0 Secs (Pattern 2)] [=>885.0 Secs (Pattern 3)]	[2]	
3		(1) NGC-2336-CENTER	ACS/WFC, ACCUM, WFC-FIX	F814W				Pattern 1, Exps 3-3 in Visit 03 (1)	300 Secs (2730 Secs)	
								[=>910.0 Secs (Pattern 1)] [=>910.0 Secs (Pattern 2)] [=>910.0 Secs (Pattern 3)]	[3]	

