15083 - Star Clusters in Tidal Debris: A UV Survey of Stellar Populations, Galaxy Interactions, and Evolution

Cycle: 25, 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) NGC-1487E	WFC3/UVIS	2	03-Jan-2018 14:06:19.0	yes
05	(18) NGC-3256W	WFC3/UVIS	2	03-Jan-2018 14:06:20.0	yes
06	(19) NGC-3256E	WFC3/UVIS	2	03-Jan-2018 14:06:22.0	yes
07	(13) NGC-6872E	WFC3/UVIS	2	03-Jan-2018 14:06:23.0	yes
02	(2) NGC-1487W	WFC3/UVIS	2	03-Jan-2018 14:06:24.0	yes
03	(5) NGC-2992 ANY	ACS/WFC WFC3/UVIS	1	03-Jan-2018 14:06:25.0	yes
04	(5) NGC-2992 ANY	ACS/WFC WFC3/UVIS	1	03-Jan-2018 14:06:27.0	yes

12 Total Orbits Used

ABSTRACT

Tidal tails afford us a unique window into the processes shaping star formation, offering an unobstructed view of the star formation environment in these outskirts. The latest galactic merger simulations are finding an unexpected increase of star formation in extended tidal debris, with 20 - 50% of the systems star formation rate occurring in these regions. We see this observationally in massive clusters forming in the Tadpole galaxy, occupying 30% of the system's star formation rate. At the same time, clusters suffer high rates of disruption, dispersing their material into the diffuse light of the tail and mixing with old stars drawn from the parent galaxies. We intend to break our tidal tails into their composite populations using HST and ground-based Gemini imaging. Our existing WFPC2 VI-band and HI data indicate clusters prefer to live in regions of high HI kinetic energy and low shear. However, analysis is limited to population studies, as the lack of UB-band data prevents us from age or mass estimates, permitting only a shallow understanding of the relationship between local HI properties and star clusters. Additionally, while the high resolution of HST is necessary for identifying and studying star clusters, it is unsuitable for the sensitive imaging needed to study the faint, diffuse tails. Our proposed 11 orbits of WFC3/ACS UB-band imaging will allow for precise age and mass measurements of our star clusters, while ground-based imaging searches the diffuse light for the cluster destruction history. In this manner, we will determine the present and past history of star formation in tidal tails, and the HI densities and kinematics required for cluster formation.

OBSERVING DESCRIPTION

Our program involves U/F336W and B/F438W WFC3 imaging of tidal tails in which WFPC2 V/I imaging data is already available. We are interested in photometry of faint point- and marginally-resolved sources over the entire WFC3 FOV, and we are requesting a 4 point dither pattern (where possible- see parallels below) for each filter to properly sample the PSF in our final, combined images. We do not need to cover the chip gap, as long as the ORIENT ranges (below) are OK. We needed to make sure the chip gap does not cover area where stars clusters were detected in the WFPC2 data. Our original request was to have 1.5 orbits in U, and 0.5 orbit in B; however, with the preference for a 4-dither pattern, and avoiding any observing inefficiencies with <360s exposures, our best possible observing strategy appears to be 1.3 orbits (U), the remainder of the 2nd orbit in B. Although we are interested in the highest possible S/N in our observations, we have left a few x 10s left in each orbit to allow for maximum flexibility in scheduling. Should these cuts be unnecessary, we would like to bump up the F336W observation exposure times as much as is possible to fill the orbit, while still allow for maximum schedulability

VIsits: Five of our visits are two-orbits in length, and make use of WFC3 alone, with no parallels. In those cases, we have adopted a 4 point DITHER-BOX pattern to providue the best possible PSF sampling. We do NOT need to fill in the chip gap for these observations. For the 2 single-orbit visits of NGC2992/3, we have requersted parallel observations. We have found that there appears to be no effieicnt way to get 4 equal exposures in the primary camera *and* have 4 equal exposures in the parallel obervations. For these visits I have created a manual (using POS-TARGs) 4 point dither pattern, but with unequal exposures, and unequal FLASH values (reason I did not use set DITHER-BOX pattern)
Thus we have used a 3 point sub-pixel dithering pattern to get the bast sampling for these visits only.

FLASH: We also require a post-FLASH for all WFC3 images due to the relatively short individual exposures in both of these blue filters. We used the ETC to look at the expected range of background values assuming the lowest (faintest) possible sky background for each target (our objects span a wide range in ecliptic latitudes), and assuming no Earthshine or zodiacal light. This way we have a conservative estimate for the needed FLASH to reach 12 e-/pixel in the WFC3 images. Similar, used same methodology for the ACS images - FLASH normally not required, but the shorter exposures (400s) in F435W yield a lowest possible 19 e-/pixel, so we have added FLASH=1.0 to those. However, under normal observations perahsp we do not need to add this?

Roll Angles: Our ORIENT ranges are based on the requirement to cover the WFPC2 footprint from previous observations of these galaxies, but we have found we have many months of available scheduling for each object, with the exception of the NGC 2992/3 observations (with the parallels) where we have perhaps 1-2 weeks of schedulable time due to the much more restricted roll angle requests.

Visit

Proposal 15083, Visit 01, completed Wed Jan 03 19:06:28 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 349D TO 358 D; ORIENT 258D TO 268 D; ORIENT 78D TO 86 D

Comments: E tidal tail of NGC 1487. Using 4 dithers per filter, over 2 orbits. Thin ranges in ORIENT needed to both cover previous WFPC2 observations needed to both cover WPC2 field, and minimizing chip gap covering the tidal tails. Added 8/30 - removed one ORIENT RANGE to avoid bright star in UVIS2-quad D.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	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

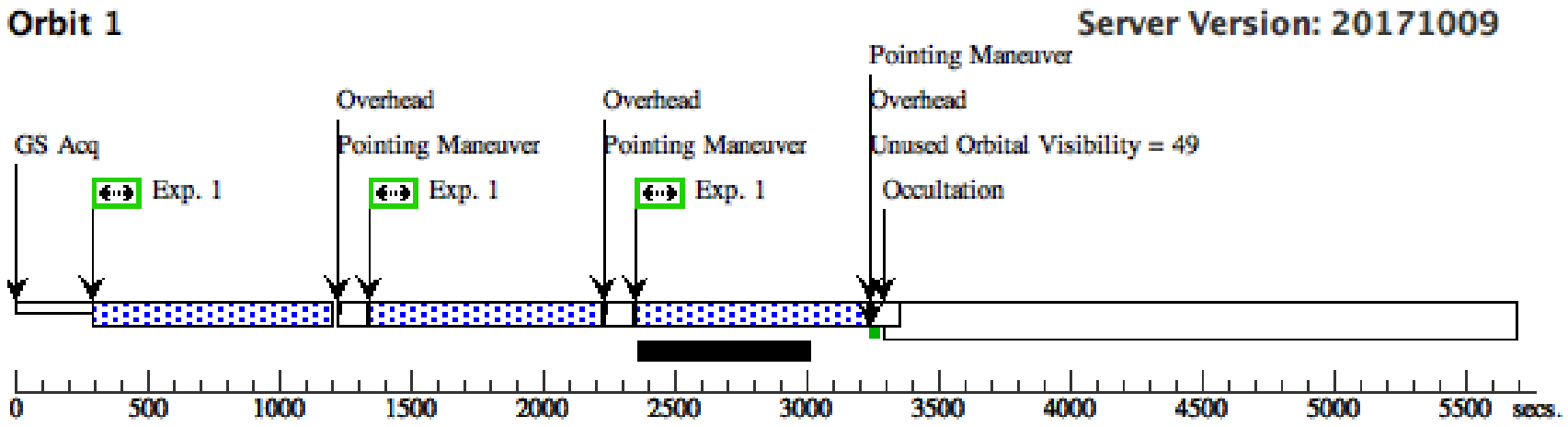
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC-1487E	RA: 03 55 48.9834 (58.9540975d) Dec: -42 20 54.17 (-42.34838d) Equinox: J2000		V=24.02+/-0.2	Reference Frame: ICRS

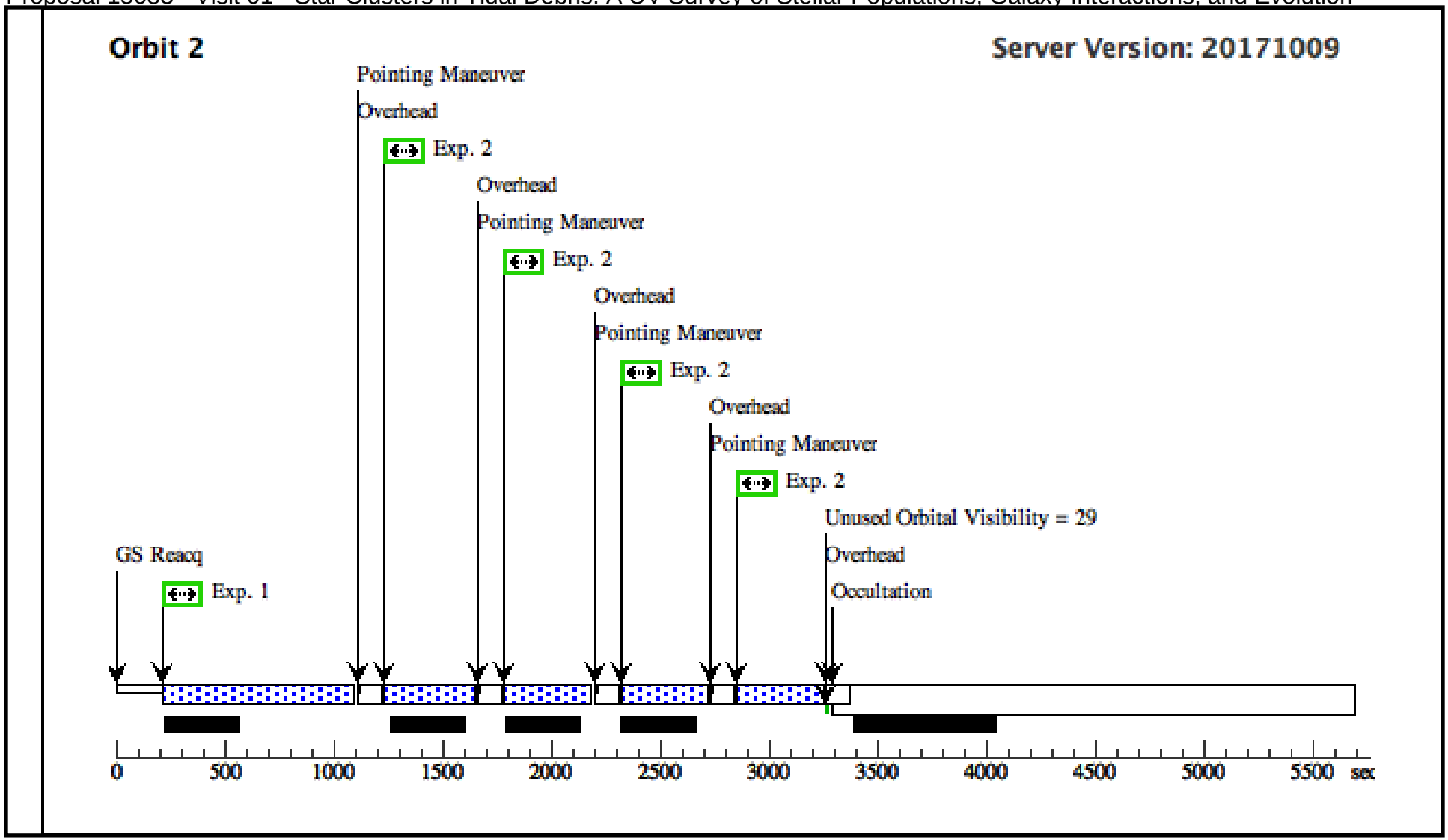
Comments: This object was generated by the targetselector and retrieved from the NED database.
Category=GALAXY
Description=[TIDAL TAIL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) NGC-1487E	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=9		Pattern 2, Exps 1-1 in Visit 01 (2)	880 Secs (3520 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[1]***
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	***[2]***
2		(1) NGC-1487E	WFC3/UVIS, ACCUM, UVIS-CENTER	F438W	FLASH=10		Pattern 2, Exps 2-2 in Visit 01 (2)	400 Secs (1600 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[2]***
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure

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Server Version: 20171009
Pointing Maneuver
Overhead
Exp. 2
Overhead
Pointing Maneuver
Exp. 2
Overhead
Pointing Maneuver
Exp. 2
Overhead
Pointing Maneuver
Exp. 2
Unused Orbital Visibility = 29
Overhead
Occultation
GS Reacq
Exp. 1
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500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 15083, Visit 05, scheduling Wed Jan 03 19:06:28 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 316D TO 322 D; ORIENT 135D TO 140 D

Comments: U/B observations of the West tidal tail of NGC 3256. ORIENT based on need to cover as much of WFPC2 footprint as possible. Added 8/30 - removed two ORIENTS to avoid bright star in UVIS2/quad D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-UVIS-DITHER-BOX	Coordinate Frame=POS-TARG		(1), (2)
	Purpose=DITHER	Pattern Orientation=23.884		
	Number Of Points=4	Angle Between Sides=81.785		
	Point Spacing=0.173	Center Pattern=false		
	Line Spacing=0.112			

Fixed Targets

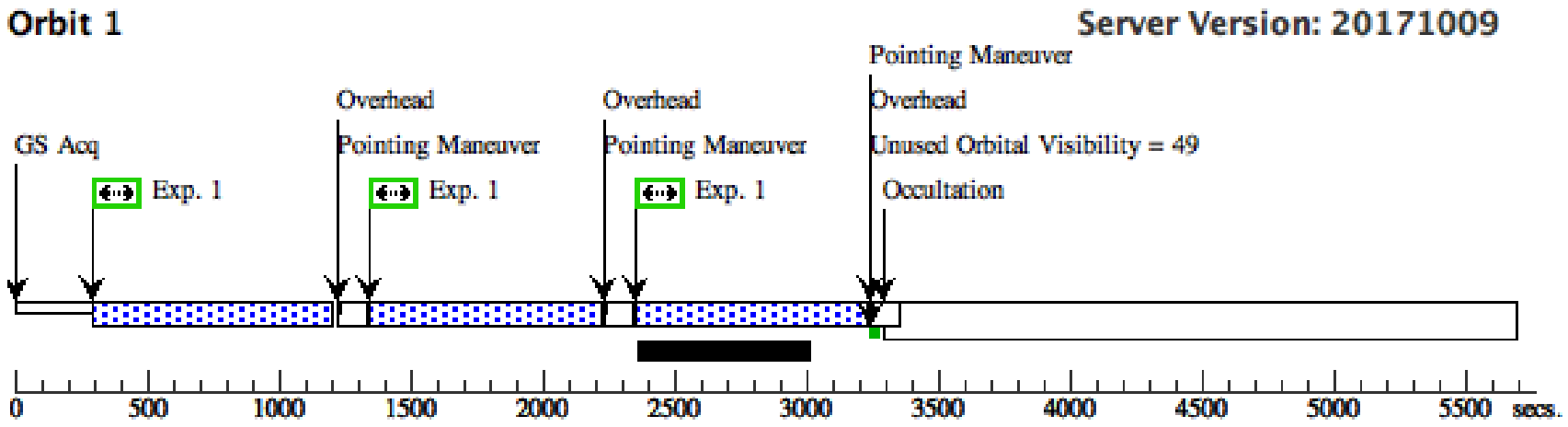
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(18)	NGC-3256W	RA: 10 27 35.9798 (156.8999158d)		V=23.75+/-0.2	Reference Frame: ICRS
		Dec: -43 53 7.79 (-43.88550d)			
		Equinox: J2000			

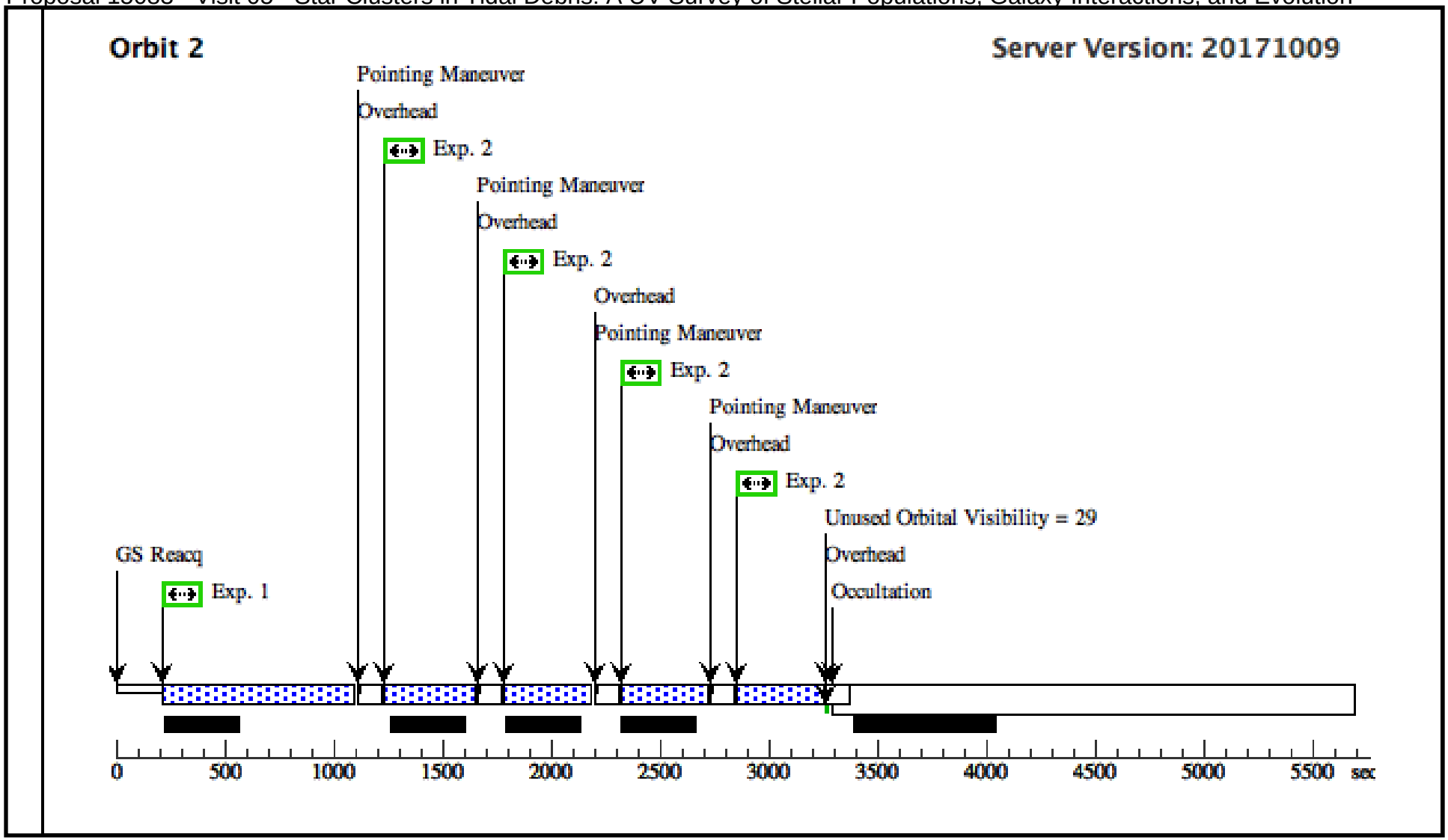
Comments: This object was generated by the targetselector and retrieved from the NED database.
Category=GALAXY
Description=[TIDAL TAIL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(18) NGC-3256W	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=9		Pattern 2, Exps 1-1 in Visit 05 (2)	880 Secs (3520 Secs)	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	***[2]***
2		(18) NGC-3256W	WFC3/UVIS, ACCUM, UVIS-CENTER	F438W	FLASH=10		Pattern 2, Exps 2-2 in Visit 05 (2)	400 Secs (1600 Secs)	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure




Orbit 2
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Pointing Maneuver
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Exp. 2
Pointing Maneuver
Overhead
Exp. 2
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Pointing Maneuver
Exp. 2
Pointing Maneuver
Overhead
Exp. 2
Unused Orbital Visibility = 29
Overhead
Occultation
GS Reacq
Exp. 1
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sec

Visit

Proposal 15083, Visit 06, scheduling Wed Jan 03 19:06:28 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 319D TO 329 D; ORIENT 140D TO 150 D

Comments: U/B observations of the East tidal tail of NGC 3256. ORIENT based on need to cover as much of WFPC2 footprint as possible. Added 8/30/17 - removed two ORIENTs to avoid bright star in UVIS2/quad D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	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

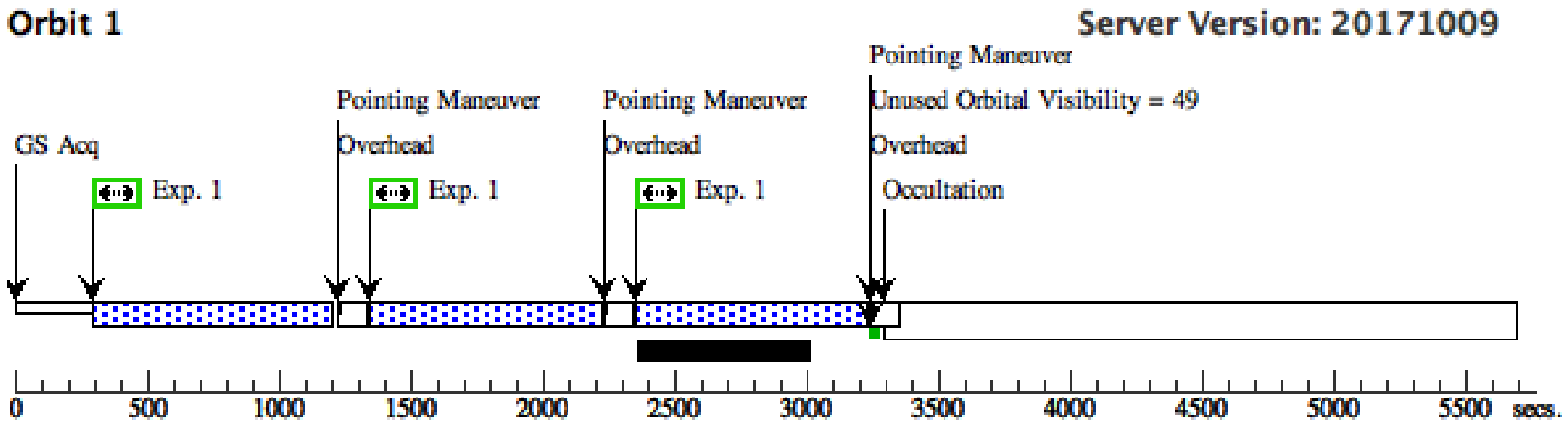
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(19)	NGC-3256E	RA: 10 28 5.6000 (157.0233333d) Dec: -43 54 22.00 (-43.90611d) Equinox: J2000		V=24.04+/-0.2	Reference Frame: ICRS

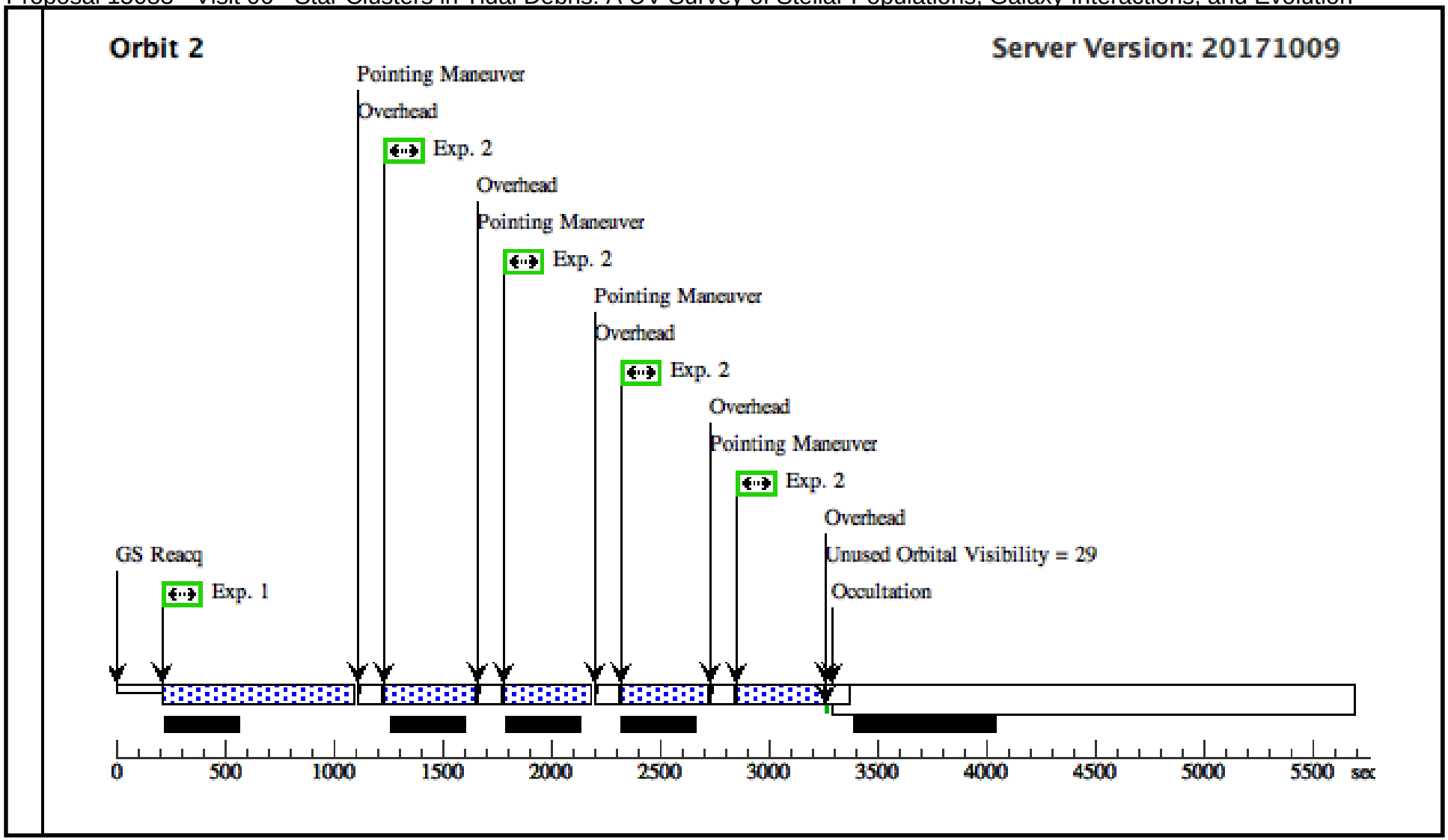
Comments:
Category=GALAXY
Description=[INTERACTING GALAXY, TIDAL TAIL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(19) NGC-3256E	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=9		Pattern 2, Exps 1-1 in Visit 06 (2)	880 Secs (3520 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[1]***
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	***[2]***
2		(19) NGC-3256E	WFC3/UVIS, ACCUM, UVIS-CENTER	F438W	FLASH=10		Pattern 2, Exps 2-2 in Visit 06 (2)	400 Secs (1600 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[2]***
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure

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Exp. 2
Overhead
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Exp. 2
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Exp. 2
Overhead
Unused Orbital Visibility = 29
Occultation
GS Reacq
Exp. 1
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sec

Visit

Proposal 15083, Visit 07, scheduling Wed Jan 03 19:06:29 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 256D TO 264 D; ORIENT 166D TO 174 D; ORIENT 348D TO 358 D

Comments: U/B observations of the East tidal tail of NGC 6872. ORIENT based on need to cover as much of WFPC2 footprint as possible. Added 8/30/17 - removed one ORIENT to avoid bright star in UVIS2/quad D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	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

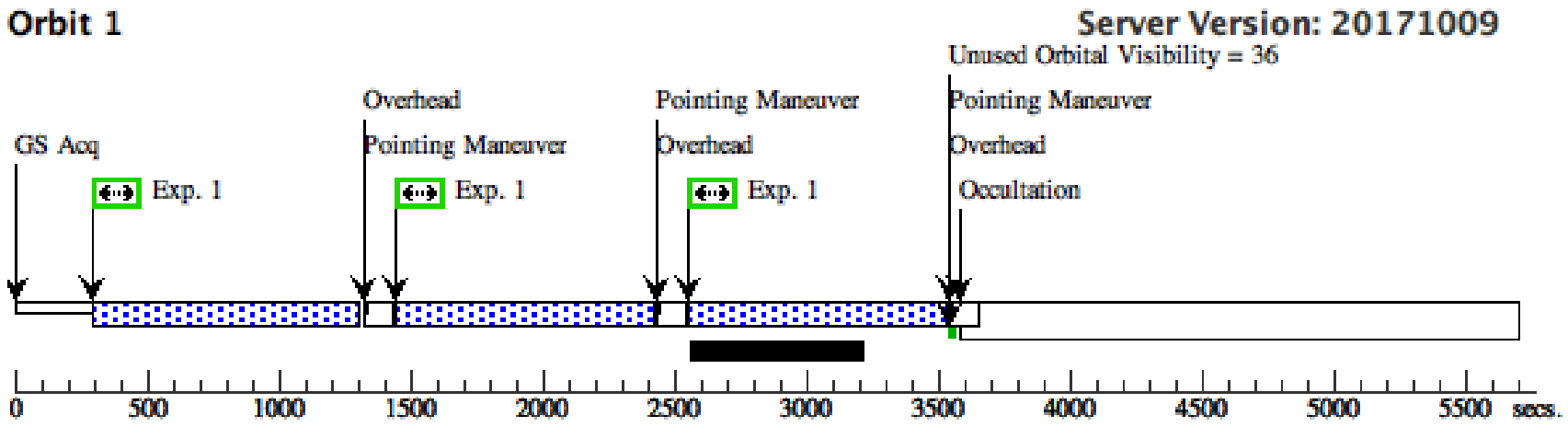
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(13)	NGC-6872E	RA: 20 17 21.9864 (304.3416100d) Dec: -70 45 3.34 (-70.75093d) Equinox: J2000		V=24.06+/-0.2	Reference Frame: ICRS

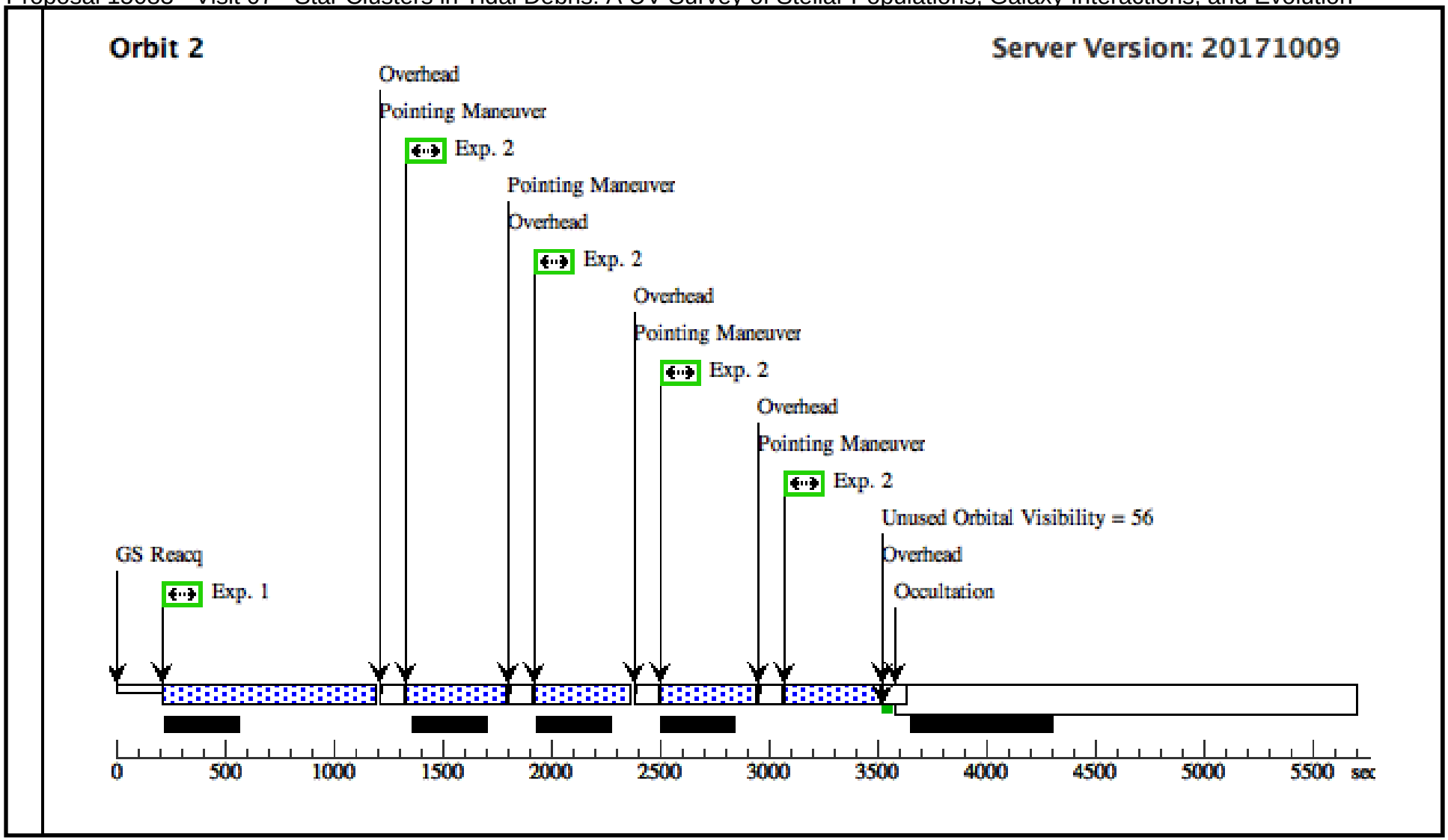
Comments: This object was generated by the targetselector and retrieved from the NED database.
Category=GALAXY
Description=[TIDAL TAIL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(13) NGC-6872E	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=9		Pattern 2, Exps 1-1 in Visit 07 (2)	980 Secs (3920 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[1]***
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	***[2]***
2		(13) NGC-6872E	WFC3/UVIS, ACCUM, UVIS-CENTER	F438W	FLASH=10		Pattern 2, Exps 2-2 in Visit 07 (2)	440 Secs (1760 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[2]***
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure




Orbit 2
Server Version: 20171009
Overhead
Pointing Maneuver
Exp. 2
Pointing Maneuver
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Exp. 2
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Pointing Maneuver
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Pointing Maneuver
Exp. 2
Unused Orbital Visibility = 56
Overhead
Occultation
GS Reacq
Exp. 1
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Visit

Proposal 15083, Visit 02, scheduling Wed Jan 03 19:06:29 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 283D TO 292 D; ORIENT 104D TO 112 D

Comments: W tidal tail of NGC 1487. Using 4 dithers per filter, over 2 orbits. Thin ranges in ORIENT needed to both cover previous WFPC2 observations needed to both cover WPC2 field, and minimizing chip gap covering the tidal tails.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	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

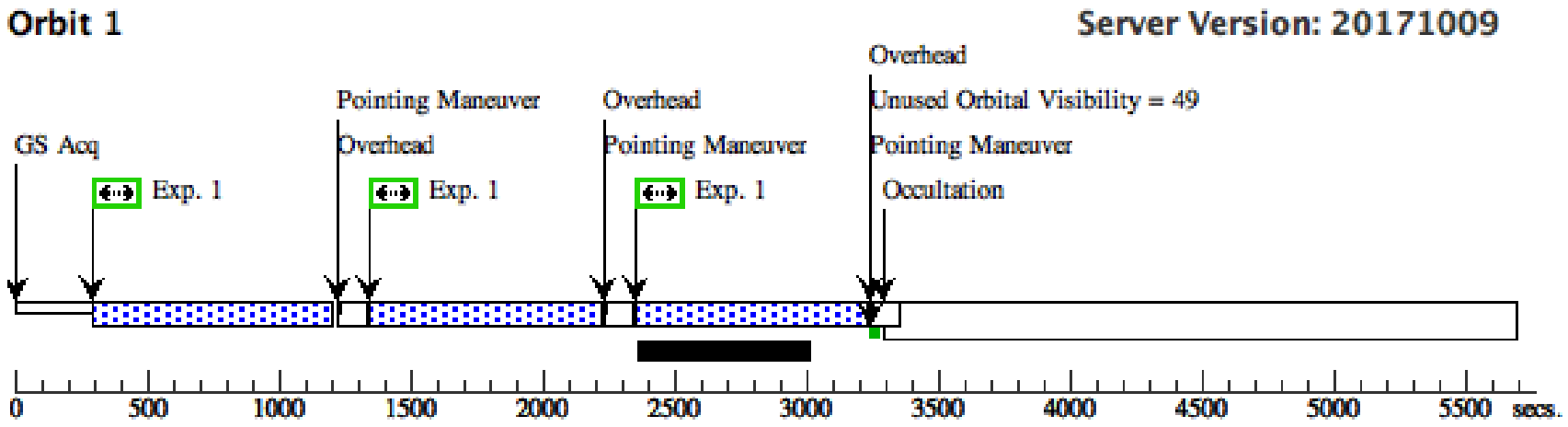
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	NGC-1487W	RA: 03 55 30.7615 (58.8781729d) Dec: -42 22 40.47 (-42.37791d) Equinox: J2000		V=24.57+/-0.2	Reference Frame: ICRS

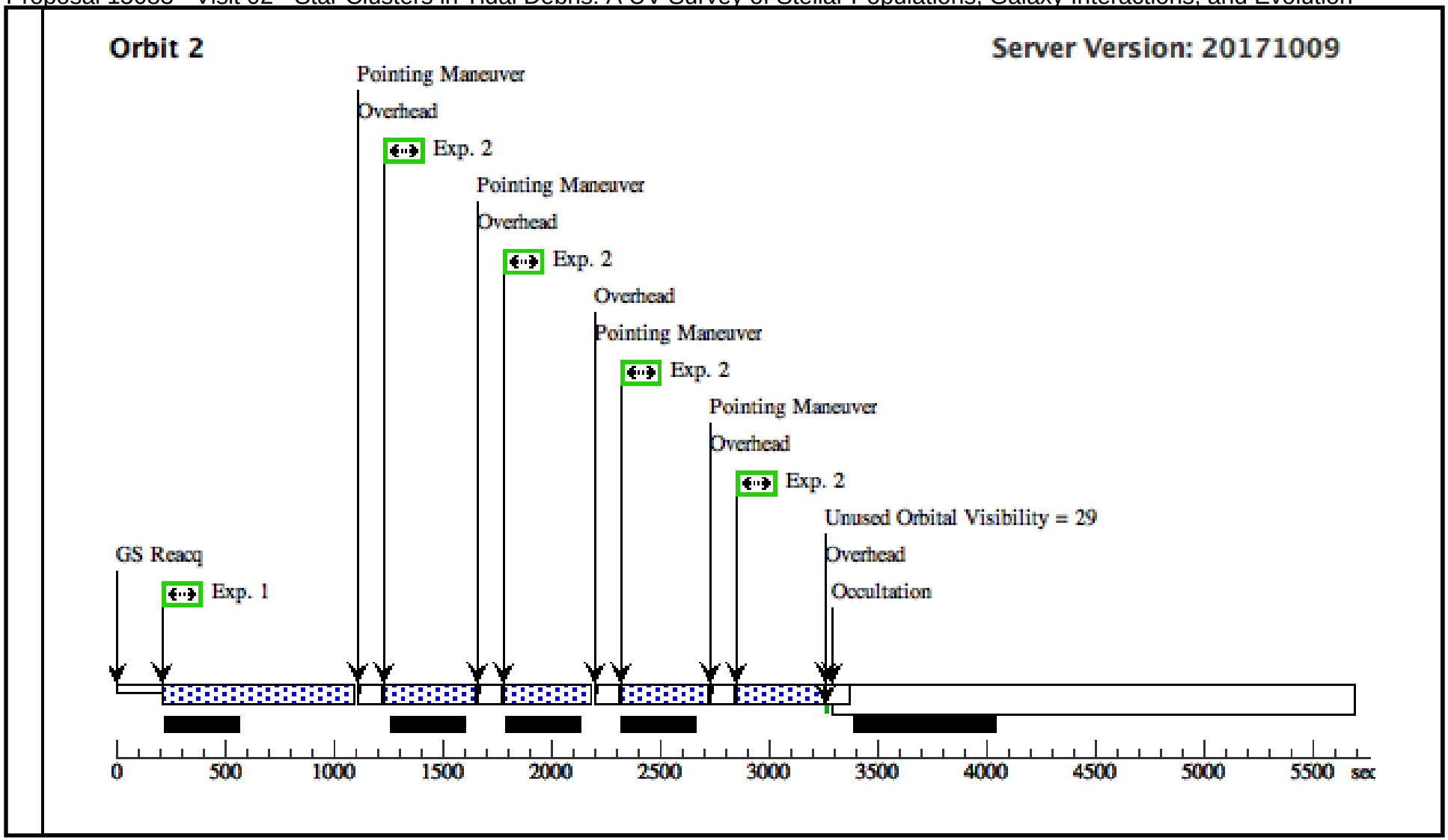
Comments: This object was generated by the targetselector and retrieved from the NED database.
Category=GALAXY
Description=[TIDAL TAIL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) NGC-1487W	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=9		Pattern 2, Exps 1-1 in Visit 02 (2)	880 Secs (3520 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[1]***
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	***[2]***
2		(2) NGC-1487W	WFC3/UVIS, ACCUM, UVIS-CENTER	F438W	FLASH=10		Pattern 2, Exps 2-2 in Visit 02 (2)	400 Secs (1600 Secs)	
								[==>(Pattern 1)]	
								[==>(Pattern 2)]	***[2]***
								[==>(Pattern 3)]	
								[==>(Pattern 4)]	

Orbit Structure




Orbit 2
Server Version: 20171009
Pointing Maneuver
Overhead
Exp. 2
Pointing Maneuver
Overhead
Exp. 2
Overhead
Pointing Maneuver
Exp. 2
Pointing Maneuver
Overhead
Exp. 2
Unused Orbital Visibility = 29
Overhead
Occultation
GS Reacq
Exp. 1
0
500
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Visit

Proposal 15083, Visit 03, implementation Wed Jan 03 19:06:29 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: ORIENT 278D TO 282 D

Comments: NGC 2992/3 - WFC3 = primary, ACS=parallel Limited roll angles required to cover both tidal tails in both cameras. 4 point DITHER-BOX, entered manually as POS-TARGS due to the different exposure times in the sequence, and the need for different FLASH values for the different exposures.
NOTE: FLASH=10 used for short (400s) ACS exposures based on faintest possible sky (MU_V=22.7) + no Earthshine and the need to get to 20e-/pixel to reduce CTE effects.

Fixed Targets

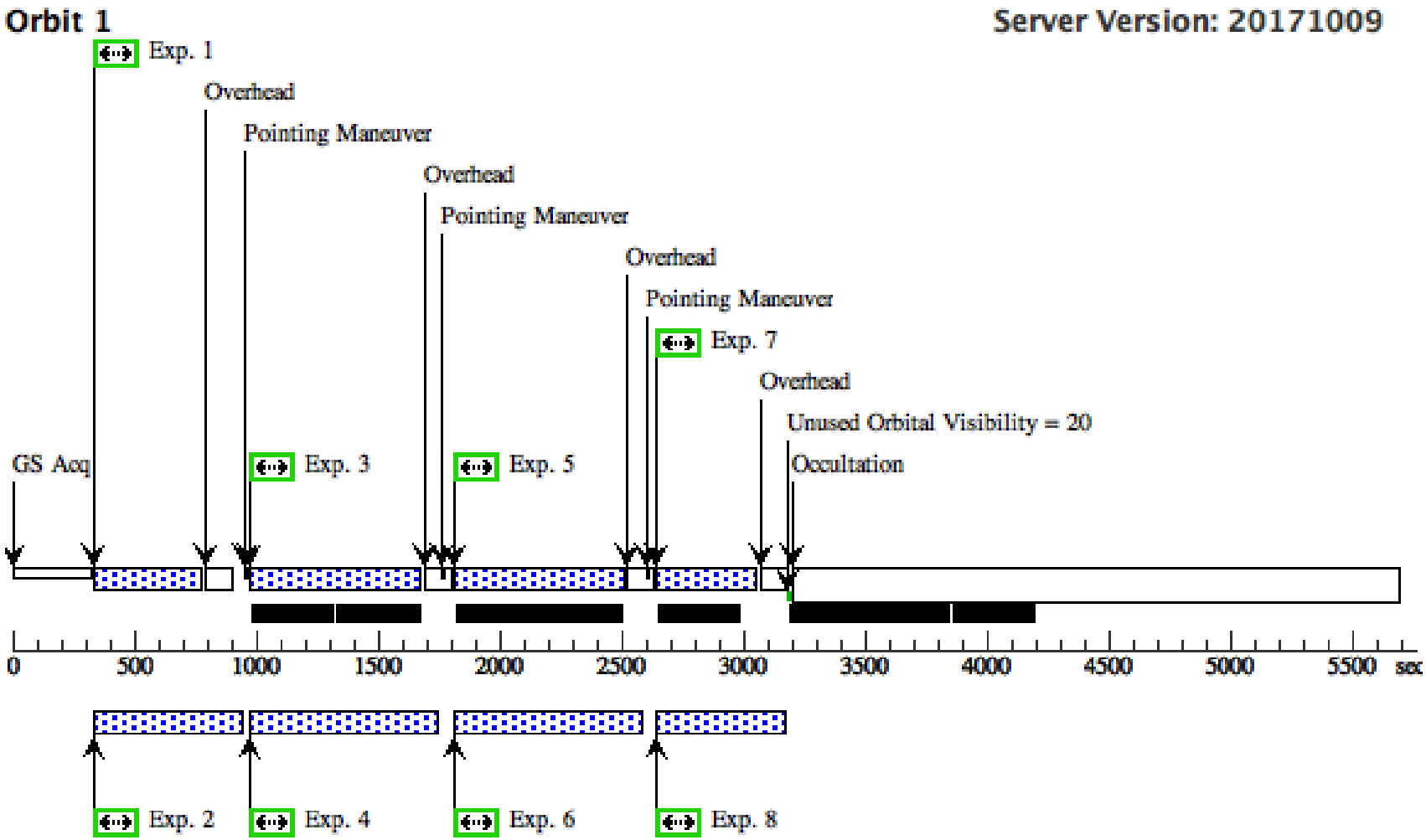
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	NGC-2992	RA: 09 45 41.5061 (146.4229421d) Dec: -14 17 29.71 (-14.29159d) Equinox: J2000		V=23.47+/-0.2	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.
Category=GALAXY
Description=[TIDAL TAIL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(5) NGC-2992	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=11.0	GS ACQ SCENARIO BASE1B3	Prime + Parallel Group 1-2 in Visit 03	700 Secs (415 Secs) *[==>415.0 Secs]*	 ***[1]***
2		ANY	ACS/WFC, ACCUM, WFCENTER	F435W	FLASH=10.0		Prime + Parallel Group 1-2 in Visit 03	520 Secs (400 Secs) *[==>400.0 Secs]*	 ***[1]***
3		(5) NGC-2992	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=9.0	POS TARG 0.158,0.059	Prime + Parallel Group 3-4 in Visit 03	700 Secs (700 Secs) *[==>]*	 ***[1]***
4		ANY	ACS/WFC, ACCUM, WFCENTER	F435W			Prime + Parallel Group 3-4 in Visit 03	650 Secs (650 Secs) *[==>]*	 ***[1]***
5		(5) NGC-2992	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=9.0	POS TARG 0.099,0.158	Prime + Parallel Group 5-6 in Visit 03	700 Secs (700 Secs) *[==>]*	 ***[1]***
6		ANY	ACS/WFC, ACCUM, WFCENTER	F435W			Prime + Parallel Group 5-6 in Visit 03	650 Secs (650 Secs) *[==>]*	 ***[1]***
7		(5) NGC-2992	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=11.0	POS TARG -0.059,0.099	Prime + Parallel Group 7-8 in Visit 03	415 Secs (415 Secs) *[==>]*	 ***[1]***
8		ANY	ACS/WFC, ACCUM, WFCENTER	F435W	FLASH=10.0		Prime + Parallel Group 7-8 in Visit 03	400 Secs (400 Secs) *[==>]*	 ***[1]***

Orbit Structure



Visit

Proposal 15083, Visit 04, implementation Wed Jan 03 19:06:29 GMT 2018

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: ORIENT 96D TO 100 D

Comments: NGC 2992/3 - WFC3 = primary, ACS=parallel Limited roll angles required to cover both tidal tails in both cameras. 4 point DITHER-BOX, entered manually as POS-TARGS due to the different exposure times in the sequence, and the need for different FLASH values for the different exposures.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	NGC-2992	RA: 09 45 41.5061 (146.4229421d) Dec: -14 17 29.71 (-14.29159d) Equinox: J2000		V=23.47+/-0.2	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.
Category=GALAXY
Description=[TIDAL TAIL]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(5) NGC-2992	ACS/WFC, ACCUM, WFCENTER	F435W	FLASH=10.0	POS TARG 0.0,0.0	Prime + Parallel Group 1-2 in Visit 04	400 Secs (400 Secs) *[==>]*	*[1]*
2		ANY	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=11.0		Prime + Parallel Group 1-2 in Visit 04	415 Secs (415 Secs) *[==>]*	*[1]*
3		(5) NGC-2992	ACS/WFC, ACCUM, WFCENTER	F435W		POS TARG 0.248,0.094	Prime + Parallel Group 3-4 in Visit 04	650 Secs (650 Secs) *[==>]*	*[1]*
4		ANY	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=9.0		Prime + Parallel Group 3-4 in Visit 04	700 Secs (700 Secs) *[==>]*	*[1]*
5		(5) NGC-2992	ACS/WFC, ACCUM, WFCENTER	F435W		POS TARG 0.124,0.233	Prime + Parallel Group 5-6 in Visit 04	650 Secs (650 Secs) *[==>]*	*[1]*
6		ANY	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=9.0		Prime + Parallel Group 5-6 in Visit 04	700 Secs (700 Secs) *[==>]*	*[1]*
7		(5) NGC-2992	ACS/WFC, ACCUM, WFCENTER	F435W	FLASH=10.0	POS TARG -0.124,0.140	Prime + Parallel Group 7-8 in Visit 04	400 Secs (400 Secs) *[==>]*	*[1]*
8		ANY	WFC3/UVIS, ACCUM, UVIS-CENTER	F336W	FLASH=11.0		Prime + Parallel Group 7-8 in Visit 04	415 Secs (415 Secs) *[==>]*	*[1]*

Orbit Structure