16762 - Probing the Origins of BST1047+1156, the Most Diffuse Star Forming Galaxy

Cycle: 29, 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) BST1047+1156	ACS/WFC WFC3/UVIS	2	26-Apr-2022 17:00:12.0	yes
02	(1) BST1047+1156	ACS/WFC WFC3/UVIS	2	26-Apr-2022 17:00:13.0	yes
10	(1) BST1047+1156	ACS/WFC WFC3/UVIS	1	26-Apr-2022 17:00:14.0	yes
09	(1) BST1047+1156	ACS/WFC WFC3/UVIS	2	26-Apr-2022 17:00:14.0	yes
03	(1) BST1047+1156	ACS/WFC WFC3/UVIS	2	26-Apr-2022 17:00:15.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
04	(1) BST1047+1156	ACS/WFC WFC3/UVIS	2	26-Apr-2022 17:00:16.0	yes
05	(1) BST1047+1156	ACS/WFC WFC3/UVIS	2	26-Apr-2022 17:00:17.0	yes
06	(1) BST1047+1156	ACS/WFC WFC3/UVIS	2	26-Apr-2022 17:00:18.0	yes
07	(1) BST1047+1156	ACS/WFC WFC3/UVIS	2	26-Apr-2022 17:00:19.0	yes
08	(1) BST1047+1156	ACS/WFC WFC3/UVIS	1	26-Apr-2022 17:00:20.0	yes

18 Total Orbits Used

ABSTRACT

The recently discovered galaxy BST 1047+1156 is the most diffuse star-forming galaxy found to date. Located in the Leo I galaxy group (D=11 Mpc), its extremely diffuse nature tests models of both galaxy formation and star formation at the lowest densities. BST1047's extraordinarily blue optical colors and UV emission both signal a recent episode of star formation in the object, even though its HI column density is well below that in which star formation typically occurs. Exactly how BST1047 formed remains unclear: it may be either a long-lived but extremely diffuse LSB galaxy caught in a tidal interaction, or a recently spawned tidal dwarf caught in the throes of disruption. Either scenario places BST1047 at the extreme limits of our understanding of galaxy evolution processes.

To resolve the question of BST1047's origins, we propose deep F606W/F814W imaging to construct a color magnitude diagram of its resolved stellar population and constrain the ages and metallicities of its stars. This will cleanly differentiate between the two formation scenarios, as the presence of old red giant branch stars would rule out the young tidal dwarf model. A purely young stellar population would mark BST1047 as a disrupting tidal dwarf, the first such object known, providing a new link between tidal interactions and dwarf galaxy formation and disruption. We will also place BST1047 on the well-determined stellar mass-metallicity relationship for normal star forming galaxies, providing another important test of its origins. Finally, we will use the BST1047's populations to probe the spatial distribution of recent and past star formation in this anomolous object.

OBSERVING DESCRIPTION

The program is to obtain very deep F606W and F814W images of a small, diffuse galaxy near M96. Our goal is to obtain photometry of point sources over the entire FOV, although the target galaxy is small enough that it will fit within a single ACS chip. We are using ACS as primary to get the larger FOV on the target galaxy, and WFC3 in parallel to obtain a 'background' field necessary for our science goals. LOW-SKY is required due to the higher-than-average sky background for targets near the ecliptic plane, and our need to get high enough S/N for very faint point sources.

Exposure Times: We are using 2 images per orbit to maximize S/N and to avoid issues with unequal exposure times and buffer dumps when taking 4 LOW-SKY images per orbit. While the images will have correspondingly more CRs, there will be 14 or 16 images in each filter, so many images from which to effectively reject CRs.

Aperture: We are using the WFC1 aperture - the object is small (but extended), we want to make sure we sample the region immediately surrounding the object. Thus, we are NOT requesting WFC1-FIX or WFC1-CTE.

Visit Locations: The program is split into 7 two orbits visits and one single orbit visit to maximize schedulability: 8 orbits for F606W and 7 for F814W for the primary ACS exposures; the parallel WFC3 images will flip the orbit allocations for the same filters. For each 2-orbit visit, we use a small custom subpixel 4 pt ACS-WFC-DITHER-BOX pattern to sample the PSF in both cameras. Between visits, POS-TARGs are used to create a slightly larger (20 pixel) BOX pattern to keep the sub-pixel dithers comparable over the entire FOV -- we do NOT need to cover the chip gap. (If 20 pixels is too large a pattern we could consider something smaller, but stil larger than the 4-point dither above) The final Visit will use a custom DITHER-LINE to match the first two points of the small, subpixel DITHER-BOX pattern.

ORIENT: We are requesting ORIENT angles between 90 and 130 degrees, so that (a) the WFC3 parallel is roughly the same distance from M96 at the ACS field (sampling the contaminating M96 halo stars, and (b) the restricted roll angles will keep the WFC3 parallel field from overlapping two rather bright stars. These limits keep the western bright star over 30" from the WFC3 FOV to avoid 'dragon's breath' Fortunately, this ORIENT range covers the majority of schedulable days, so this choice should have very little impact on the ability to schedule.

Reduced Gyro Mode: We are relatively flexible in roll angle and targeting, so if such adjustments need to be made in Reduced Gyro Mode, we can accommodate these (few percent reduction in exposures, changing apertures for guide star acquisition) with little difficulty, The loss of entire orbits, however, would make our project very difficult to execute. Past experience with single guide star guiding resulted in significant image quality

degradation, so if we needed to operate under these conditions, our project goals could be difficult to achieve.

Pre-Flash: Due to the relatively long exposures (2 images per orbit for each camera), the wide-passbands, and the relatively high sky background (near the ecliptic), we expect WFC3 sky backgrounds of at least 30 e- (assuming a faintest possible sky of MU_V=22.5), so well above the 20e- threshold below which a pre-flash would be required. No pre-flash is required for any of our exposures.

Visit

Proposal 16762, BST1054 - F606W orbits 1-2 (01), completed Tue Apr 26 21:00:20 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: ORIENT 90D TO 130 D

Comments: Visit 1 - first two orbits with ACS+F606W, and WFC3 parallel F814W. Observations within visit are in a 4 point subpixel dither box pattern to overcome bad/hot pixels

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1-2)

Fixed Targets

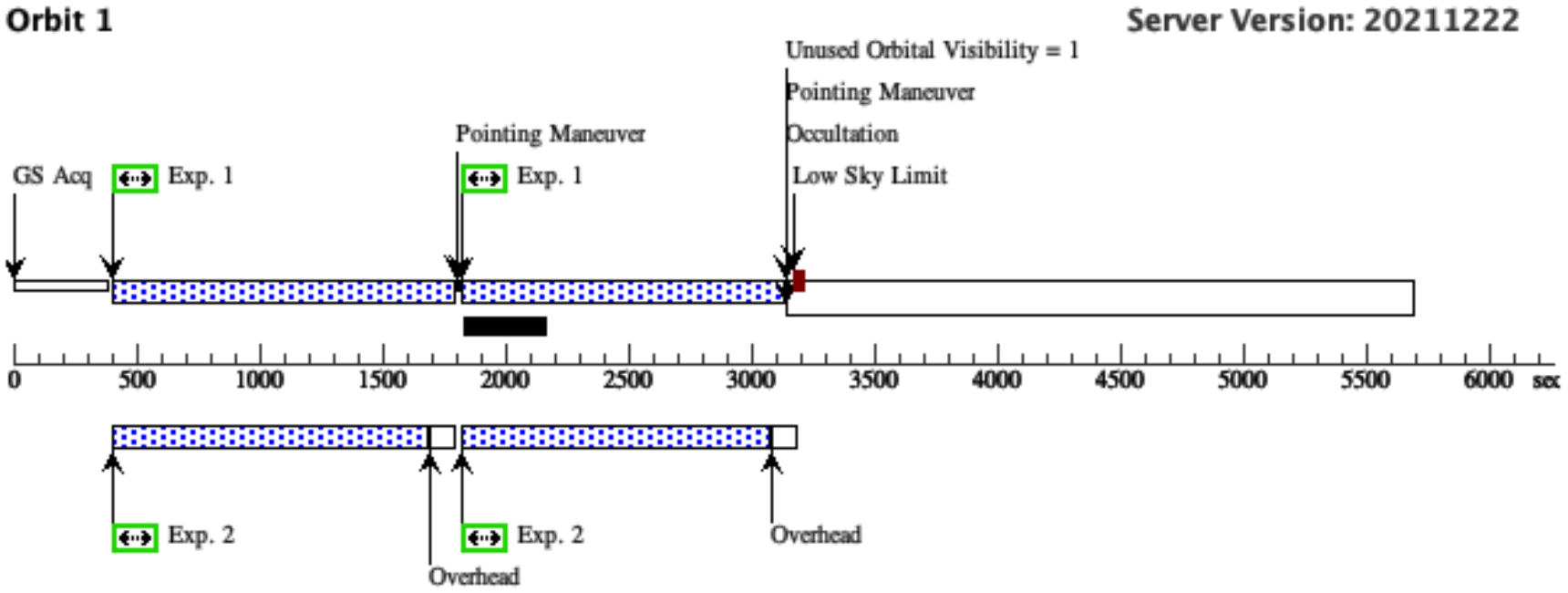
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BST1047+1156	RA: 10 47 43.8000 (161.9325000d) Dec: +11 56 1.00 (11.93361d) Equinox: J2000		V=26.0	Reference Frame: ICRS

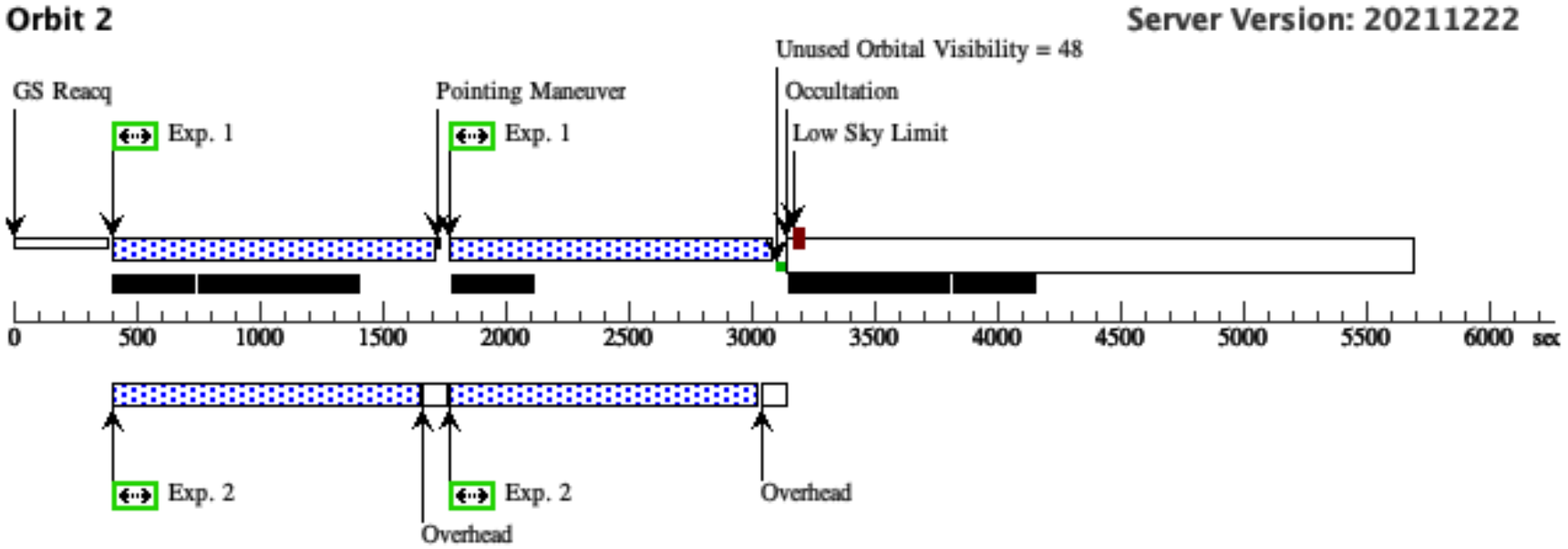
Comments:
Category=EXT-CLUSTER
Description=[STAR FORMING REGION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) BST1047+1156	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0.,0.; LOW-SKY	Pattern 1, Exps 1-2 in BST1054 - F606W orbits 1-2 (01) (1)	1185 Secs (4740 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
							Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F606W orbits 1-2 (01)	*[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[2]***
2		(1) BST1047+1156	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W			Pattern 1, Exps 1-2 in BST1054 - F606W orbits 1-2 (01) (1)	1250 Secs (5000 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
							Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F606W orbits 1-2 (01)	*[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 16762, BST1054 - F606W orbits 3-4 (02), failed Tue Apr 26 21:00:20 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01

Comments: Visit 2 - orbits 3-4 s with ACS+F606W, and WFC3 parallel F814W. Observations within visit are in a 4 point subpixel dither box pattern to overcome bad/hot pixels

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1-2)

Fixed Targets

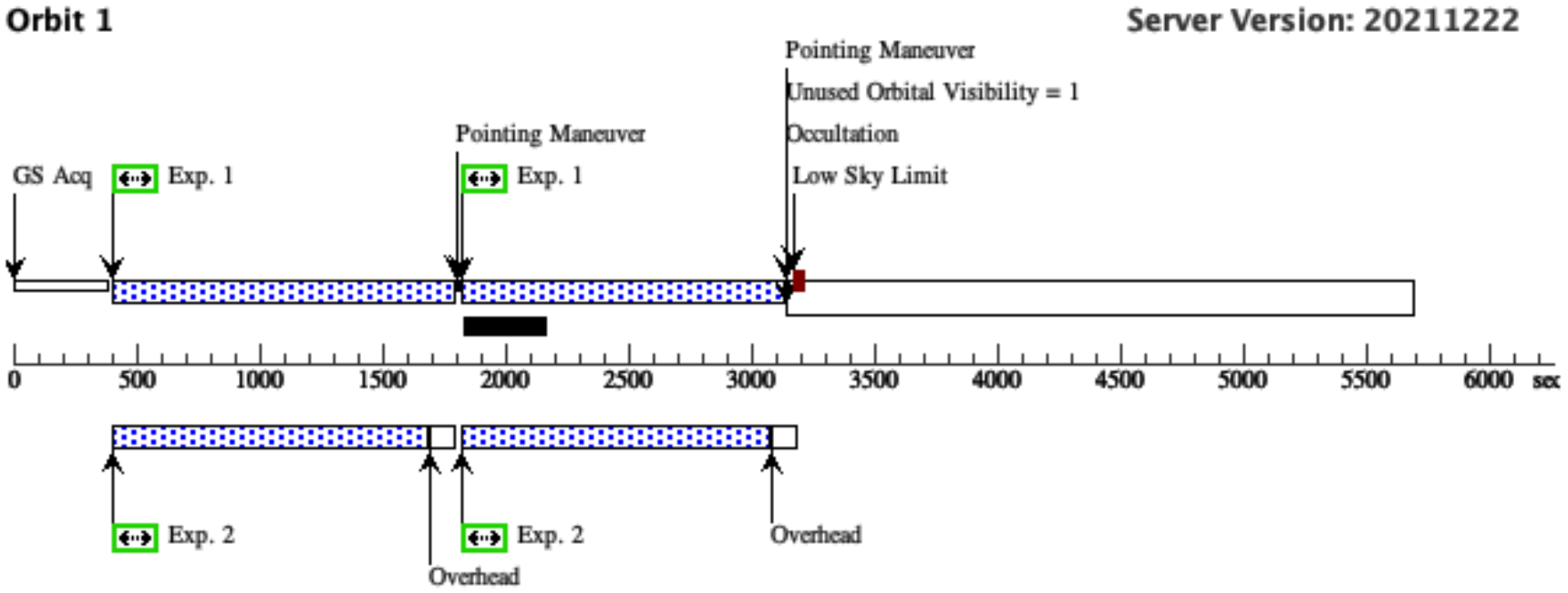
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BST1047+1156	RA: 10 47 43.8000 (161.9325000d) Dec: +11 56 1.00 (11.93361d) Equinox: J2000		V=26.0	Reference Frame: ICRS

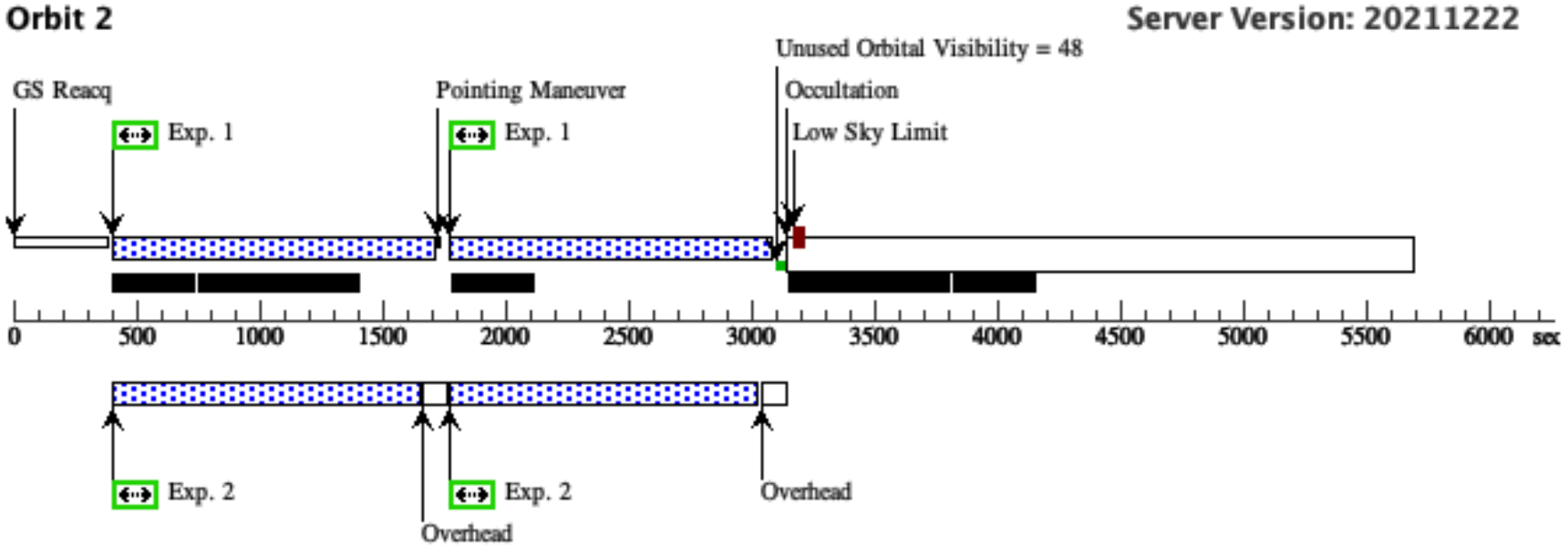
Comments:
Category=EXT-CLUSTER
Description=[STAR FORMING REGION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) BST1047+1156	ACS/WFC, ACCUM, WFC1	F606W		POS TARG -0.98,0.00; LOW-SKY	Pattern 1, Exps 1-2 in BST1054 - F606W orbits 3-4 (02) (1)	1185 Secs (4740 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
							Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F606W orbits 3-4 (02)	*[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[2]***
2		(1) BST1047+1156	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W			Pattern 1, Exps 1-2 in BST1054 - F606W orbits 3-4 (02) (1)	1250 Secs (5000 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
							Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F606W orbits 3-4 (02)	*[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 16762, BST1054 - F606W orbit 3 (10) Tue Apr 26 21:00:21 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01

Comments: Visit 02/09 repeat - orbit 3 with ACS+F606W, and WFC3 parallel F814W. Observations within visit are matched to exposure 1&2 in a 4 point subpixel dither box pattern to overcome bad/hot pixels

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(3)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.265 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides= Center Pattern=false		(1-2)

Fixed Targets

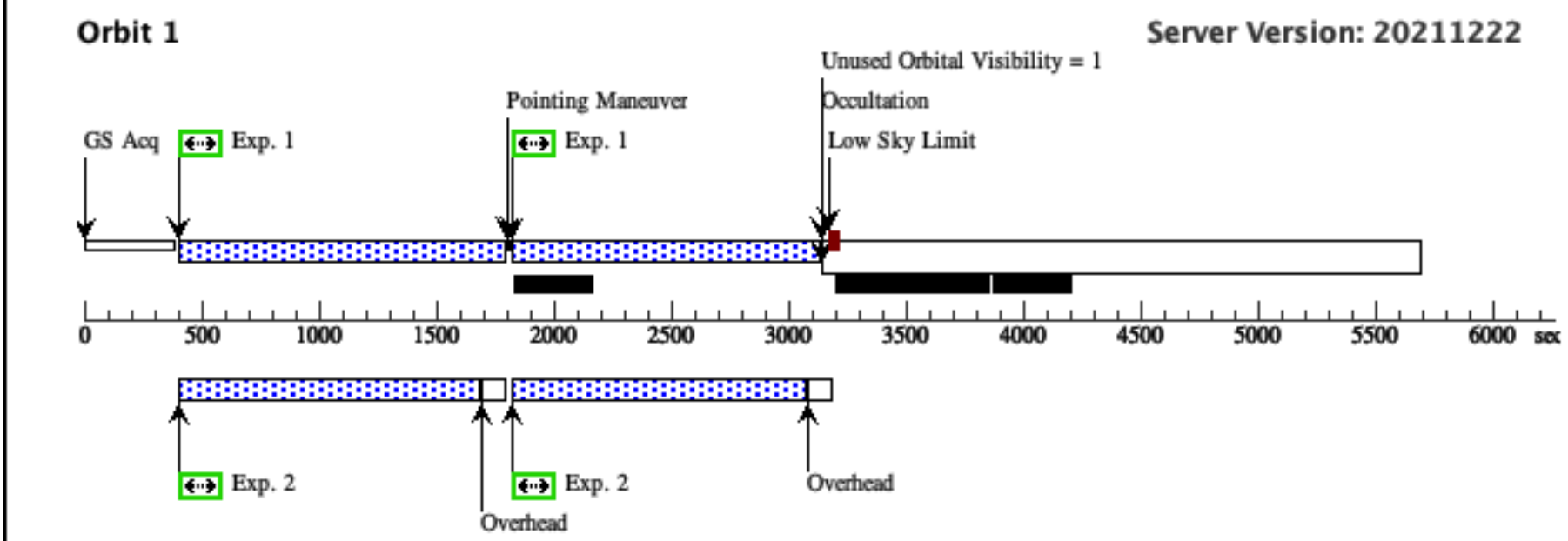
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BST1047+1156	RA: 10 47 43.8000 (161.9325000d) Dec: +11 56 1.00 (11.93361d) Equinox: J2000		V=26.0	Reference Frame: ICRS

Comments:
Category=EXT-CLUSTER
Description=[STAR FORMING REGION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) BST1047+1156	ACS/WFC, ACCUM, WFC1	F606W		POS TARG -0.98,0.0; LOW-SKY	Pattern 3, Exps 1-2 in BST1054 - F606W orbit 3 (10) (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in BST1054 - F606W orbit 3 (10)	1185 Secs (2370 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[1]***
2		(1) BST1047+1156	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W			Pattern 3, Exps 1-2 in BST1054 - F606W orbit 3 (10) (3) Prime + Parallel Group 1-2 in Pattern 3, Exps 1-2 in BST1054 - F606W orbit 3 (10)	1250 Secs (2500 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[1]***

Orbit Structure



Visit

Proposal 16762, BST1054 - F606W orbits 3-4 (09), failed Tue Apr 26 21:00:21 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01

Comments: Visit 9 (repeat observation of failed Visit 02) - orbits 3-4 with ACS+F606W, and WFC3 parallel F814W. Observations within visit are in a 4 point subpixel dither box pattern to overcome bad/hot pixels

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1-2)

Fixed Targets

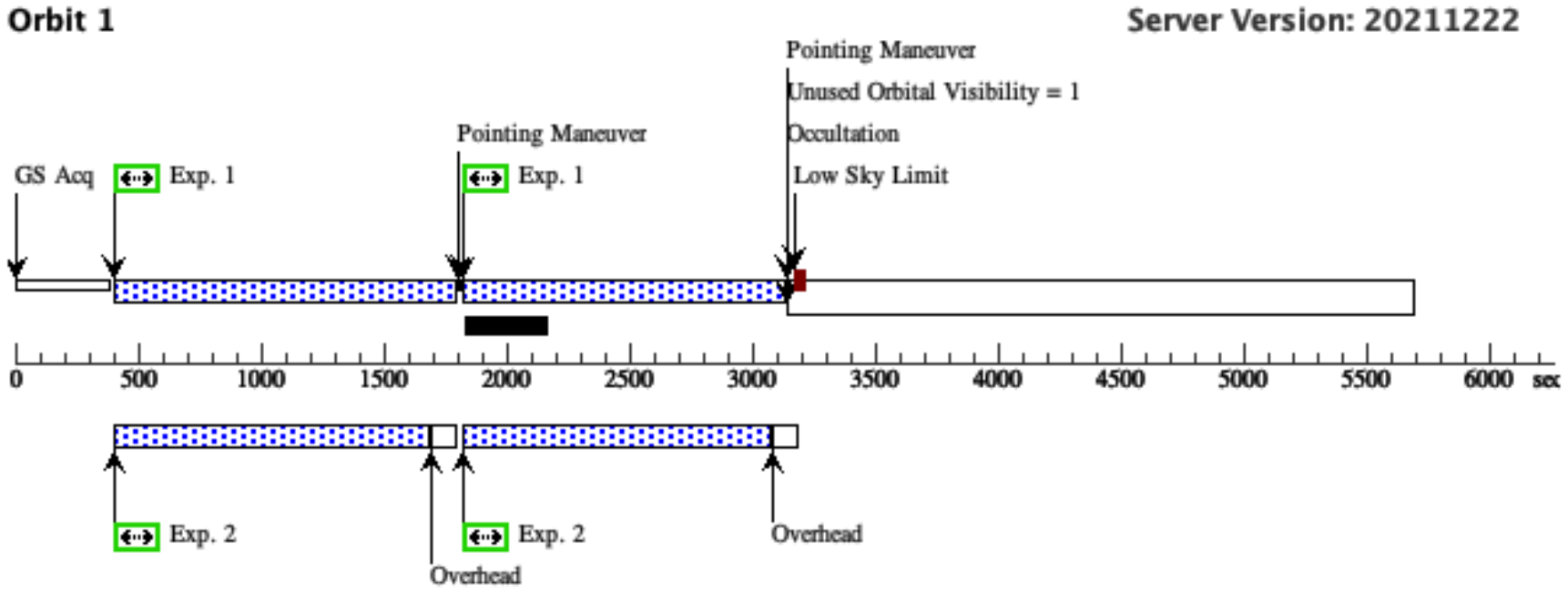
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BST1047+1156	RA: 10 47 43.8000 (161.9325000d) Dec: +11 56 1.00 (11.93361d) Equinox: J2000		V=26.0	Reference Frame: ICRS

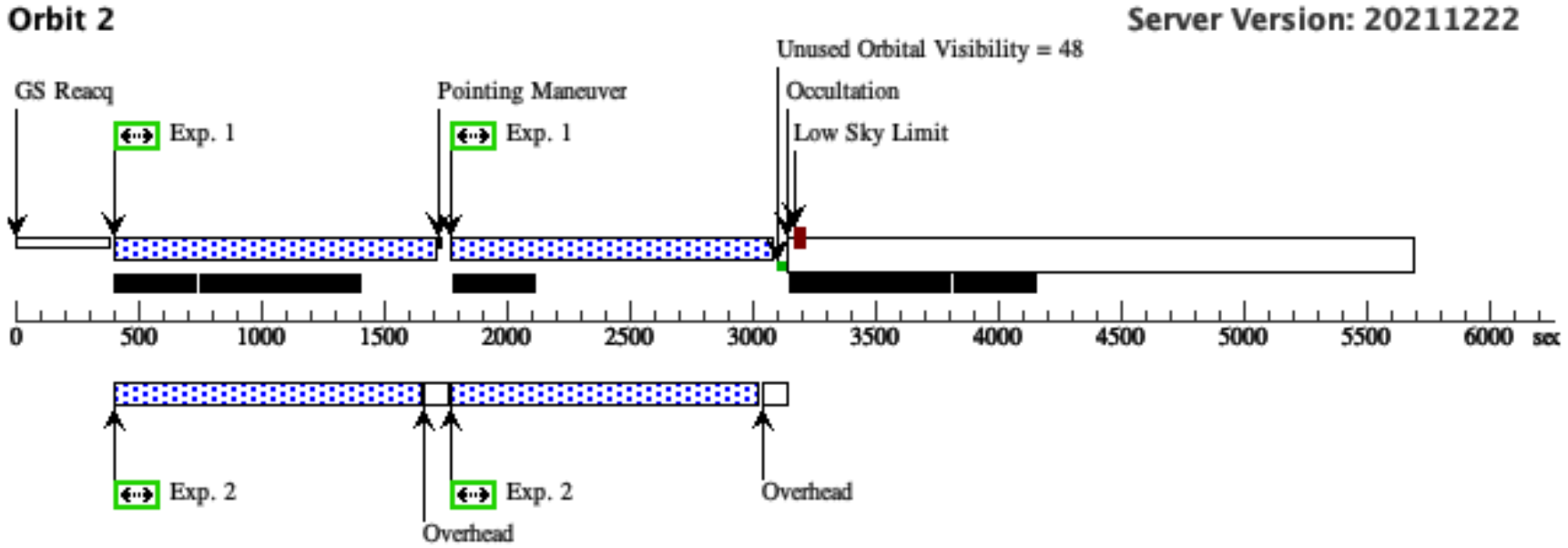
Comments:
Category=EXT-CLUSTER
Description=[STAR FORMING REGION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) BST1047+1156	ACS/WFC, ACCUM, WFC1	F606W		POS TARG -0.98,0.00; LOW-SKY	Pattern 1, Exps 1-2 in BST1054 - F606W orbits 3-4 (09) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F606W orbits 3-4 (09)	1185 Secs (4740 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	 ***[1]*** ***[2]***
2		(1) BST1047+1156	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W			Pattern 1, Exps 1-2 in BST1054 - F606W orbits 3-4 (09) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F606W orbits 3-4 (09)	1250 Secs (5000 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	 ***[1]*** ***[2]***

Orbit Structure





Visit

Proposal 16762, BST1054 - F606W orbits 5-6 (03), completed Tue Apr 26 21:00:21 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01

Comments: Visit 2 - orbits 5-6 with ACS+F606W, and WFC3 parallel F814W. Observations within visit are in a 4 point subpixel dither box pattern to overcome bad/hot pixels

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1-2)

Fixed Targets

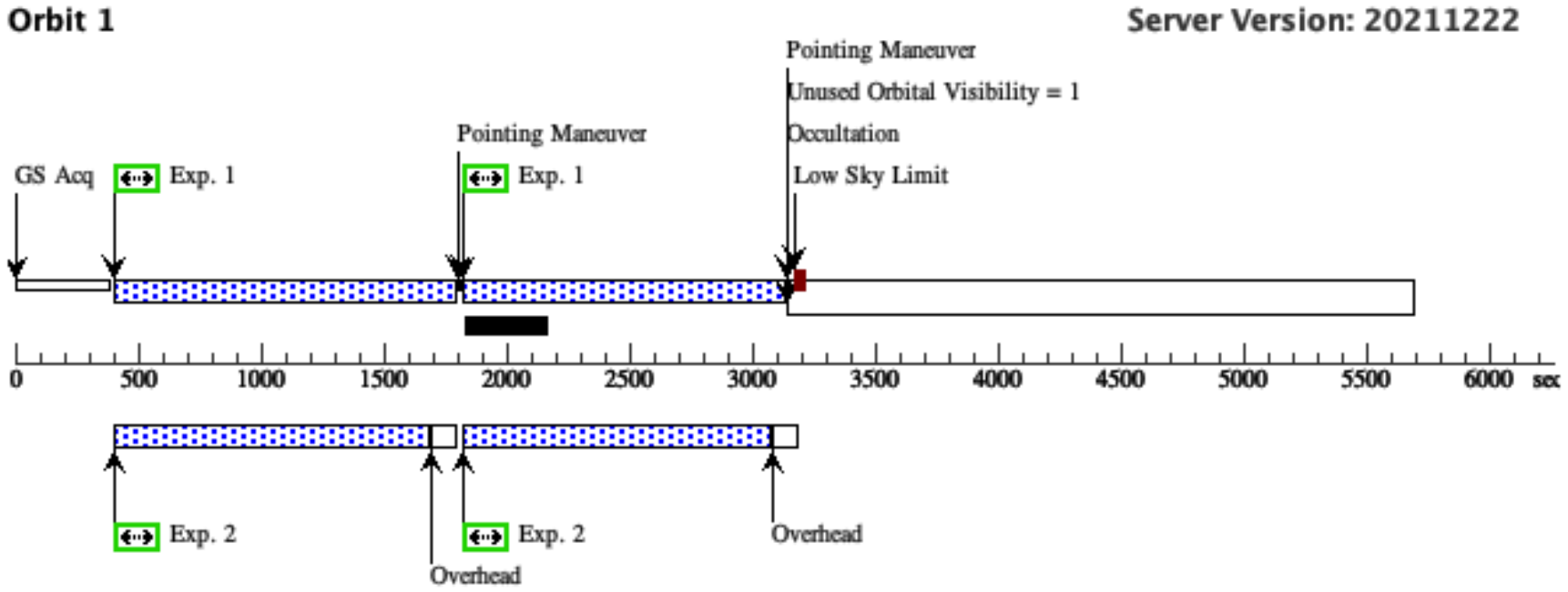
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BST1047+1156	RA: 10 47 43.8000 (161.9325000d) Dec: +11 56 1.00 (11.93361d) Equinox: J2000		V=26.0	Reference Frame: ICRS

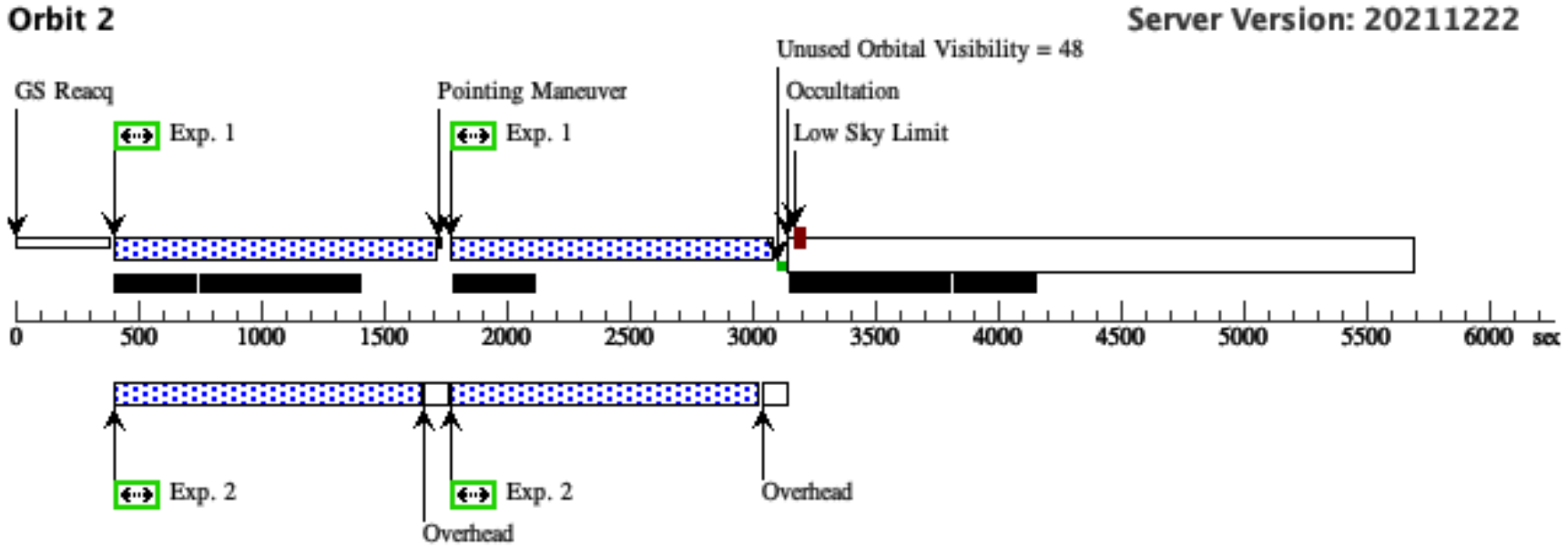
Comments:
Category=EXT-CLUSTER
Description=[STAR FORMING REGION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) BST1047+1156	ACS/WFC, ACCUM, WFC1	F606W		POS TARG 0,-0.98; LOW-SKY	Pattern 1, Exps 1-2 in BST1054 - F606W orbits 5-6 (03) (1)	1185 Secs (4740 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
							Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F606W orbits 5-6 (03)	*[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[2]***
2		(1) BST1047+1156	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W			Pattern 1, Exps 1-2 in BST1054 - F606W orbits 5-6 (03) (1)	1250 Secs (5000 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
							Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F606W orbits 5-6 (03)	*[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 16762, BST1054 - F606W orbits 7-8 (04), completed Tue Apr 26 21:00:21 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01

Comments: Visit 4 - final (of 4) pair of orbits with ACS+606W, and WFC3 parallel F814W. Observations within visit are in a 4 point subpixel dither box pattern to overcome bad/hot pixels.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1-2)

Fixed Targets

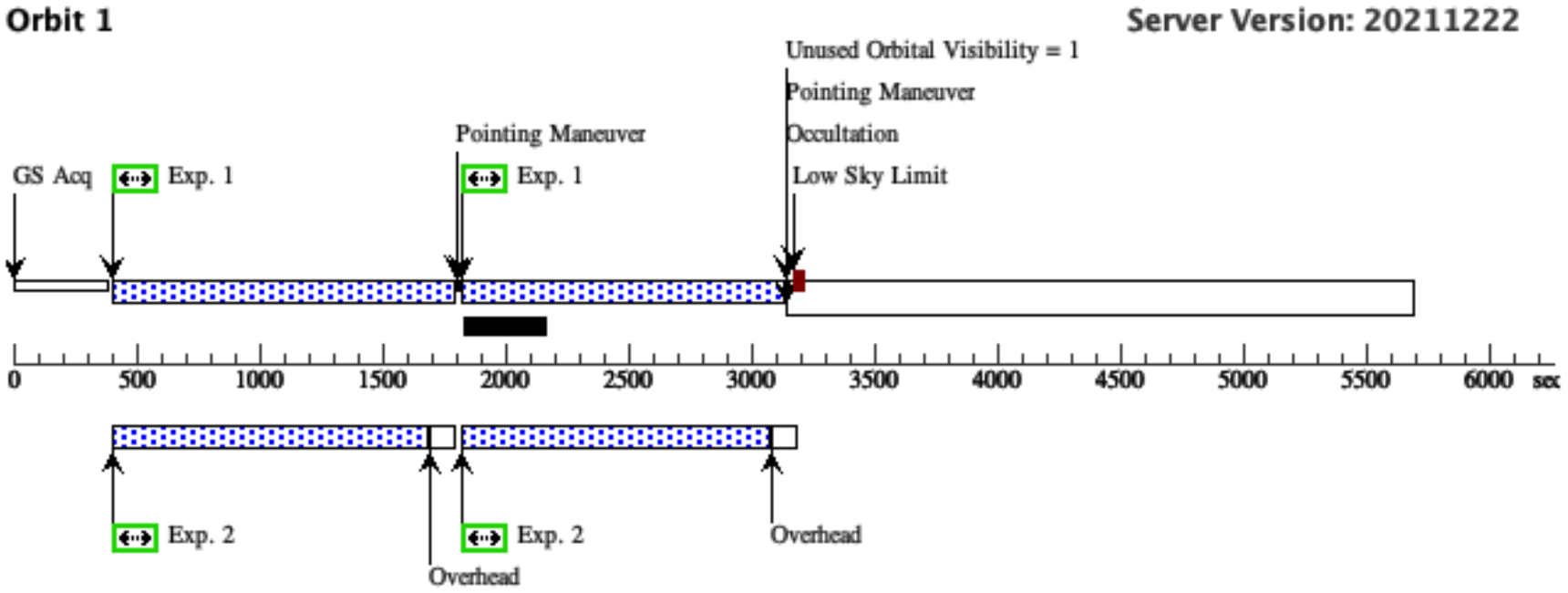
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BST1047+1156	RA: 10 47 43.8000 (161.9325000d) Dec: +11 56 1.00 (11.93361d) Equinox: J2000		V=26.0	Reference Frame: ICRS

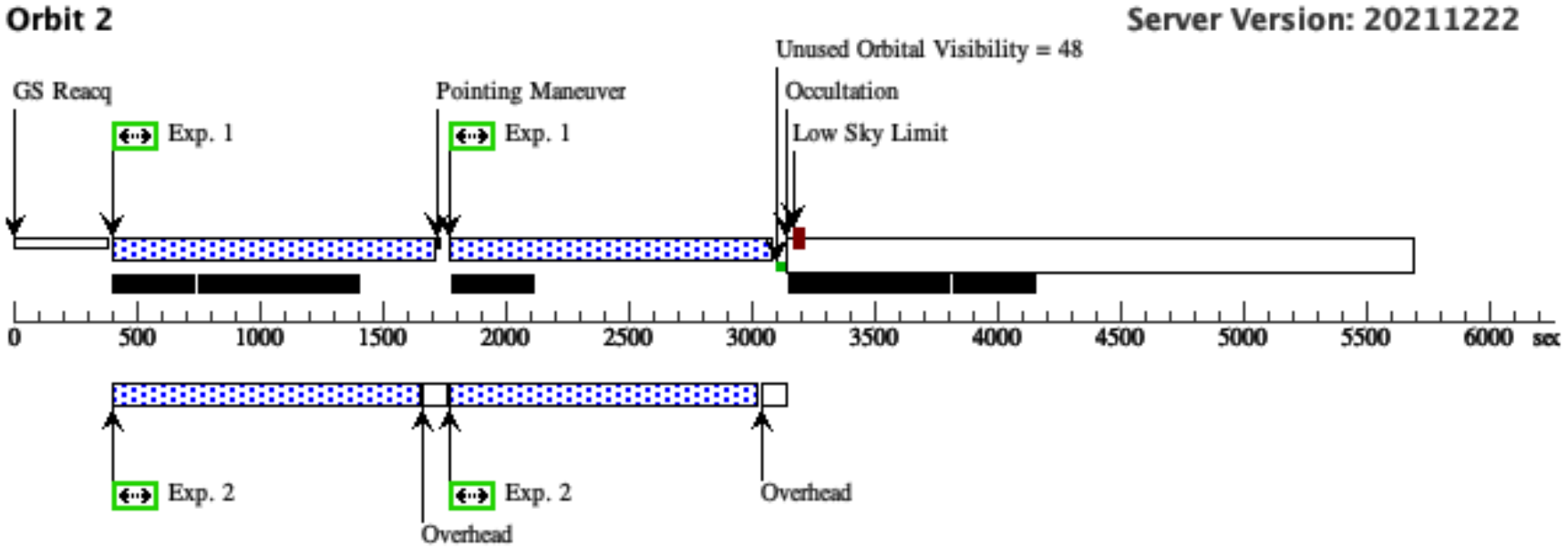
Comments:
Category=EXT-CLUSTER
Description=[STAR FORMING REGION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) BST1047+1156	ACS/WFC, ACCUM, WFC1	F606W		POS TARG -0.98,-0.98; LOW-SKY	Pattern 1, Exps 1-2 in BST1054 - F606W orbits 7-8 (04) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F606W orbits 7-8 (04)	1185 Secs (4740 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>(Pattern 3)] *[==>(Pattern 4)]*	***[2]***
2		(1) BST1047+1156	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W			Pattern 1, Exps 1-2 in BST1054 - F606W orbits 7-8 (04) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F606W orbits 7-8 (04)	1250 Secs (5000 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
								[==>(Pattern 3)] *[==>(Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 16762, BST1054 - F814W orbits 1-2 (05), completed Tue Apr 26 21:00:21 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01

Comments: Visit 5 -first pair of orbits with ACS+F814W, and WFC3 parallel F606W. Observations within visit are in a 4 point subpixel dither box pattern to overcome bad/hot pixels. Using same box pattern between visits as with the F814W observations.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1-2)

Fixed Targets

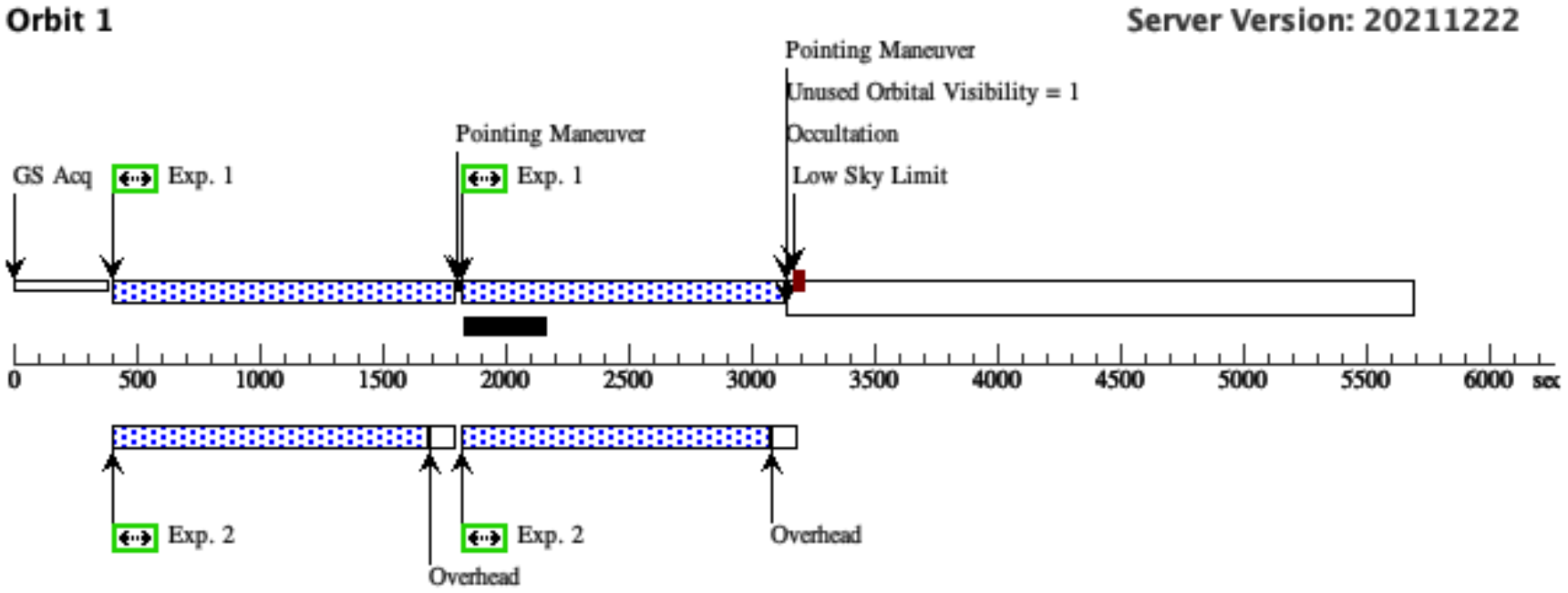
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BST1047+1156	RA: 10 47 43.8000 (161.9325000d) Dec: +11 56 1.00 (11.93361d) Equinox: J2000		V=26.0	Reference Frame: ICRS

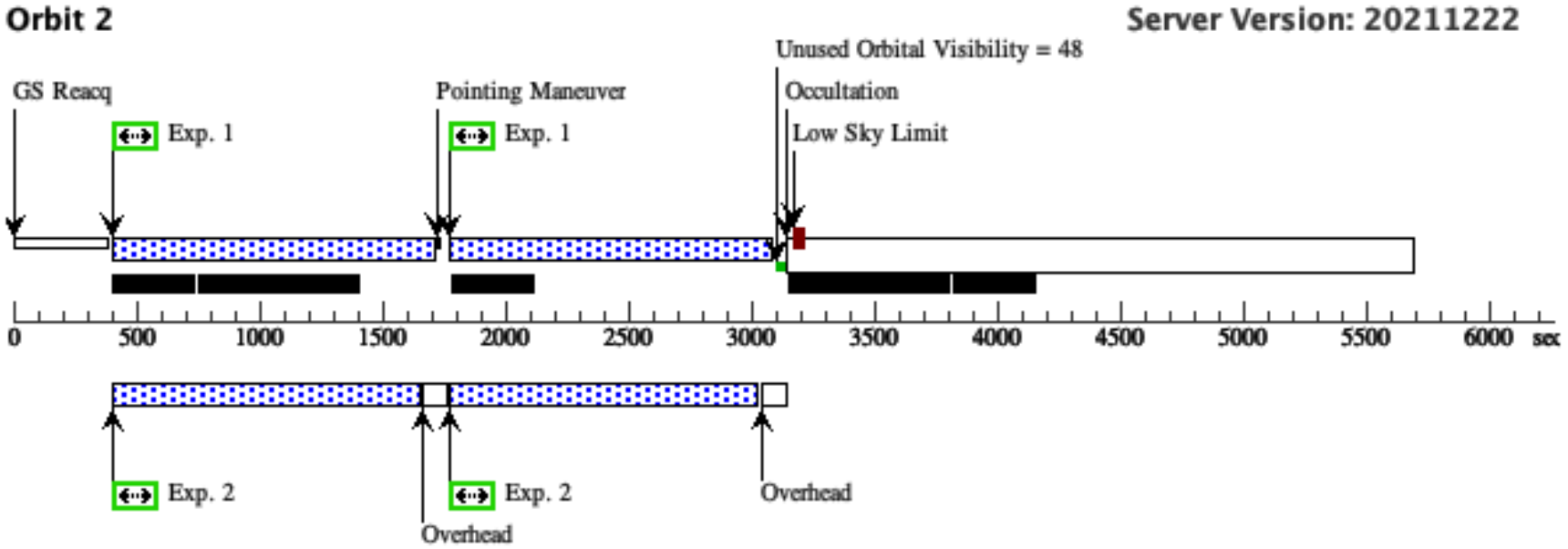
Comments:
Category=EXT-CLUSTER
Description=[STAR FORMING REGION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) BST1047+1156	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0,0; LOW-SKY	Pattern 1, Exps 1-2 in BST1054 - F814W orbits 1-2 (05) (1)	1185 Secs (4740 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
							Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F814W orbits 1-2 (05)	*[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[2]***
2		(1) BST1047+1156	WFC3/UVIS, ACCUM, UVIS-CENTER	F606W			Pattern 1, Exps 1-2 in BST1054 - F814W orbits 1-2 (05) (1)	1250 Secs (5000 Secs)	
								[==>(Pattern 1)] *[==>(Pattern 2)]*	***[1]***
							Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F814W orbits 1-2 (05)	*[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 16762, BST1054 - F814W orbits 3-4 (06), completed Tue Apr 26 21:00:21 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01

Comments: Visit 6 -second pair of orbits with ACS+F814W, and WFC3 parallel F606W. Observations within visit are in a 4 point subpixel dither box pattern to overcome bad/hot pixels. Using same box pattern between visits as with the F606W observations.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1-2)

Fixed Targets

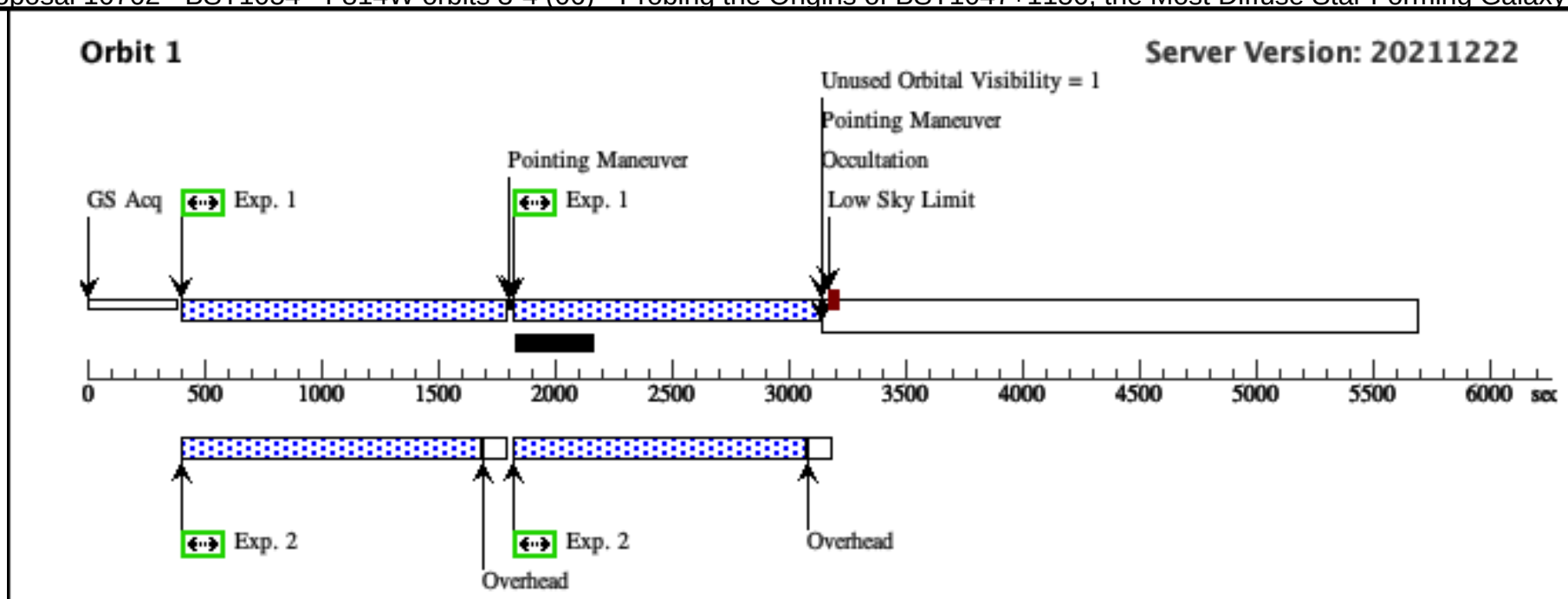
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BST1047+1156	RA: 10 47 43.8000 (161.9325000d) Dec: +11 56 1.00 (11.93361d) Equinox: J2000		V=26.0	Reference Frame: ICRS

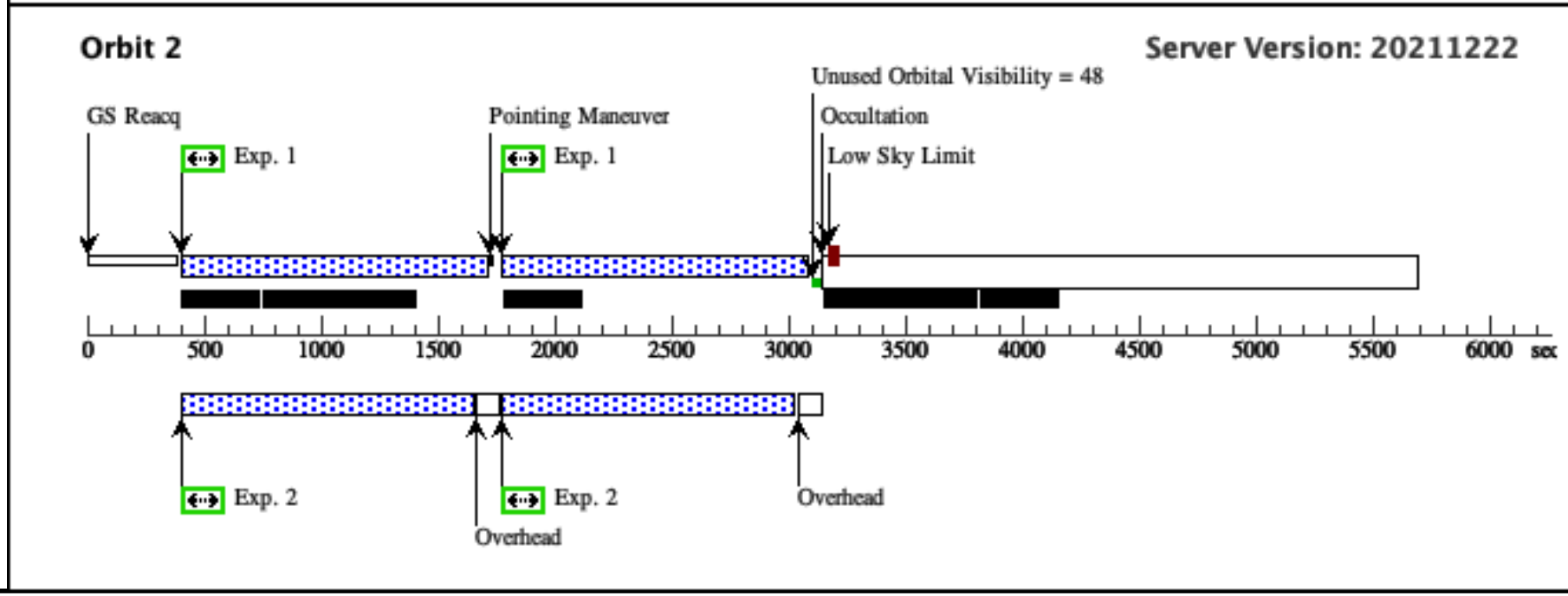
Comments:
Category=EXT-CLUSTER
Description=[STAR FORMING REGION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) BST1047+1156	ACS/WFC, ACCUM, WFC1	F814W		POS TARG -0.98,0.00; LOW-SKY	Pattern 1, Exps 1-2 in BST1054 - F814W orbits 3-4 (06) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F814W orbits 3-4 (06)	1185 Secs (4740 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	 ***[1]*** ***[2]***
2		(1) BST1047+1156	WFC3/UVIS, ACCUM, UVIS-CENTER	F606W			Pattern 1, Exps 1-2 in BST1054 - F814W orbits 3-4 (06) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F814W orbits 3-4 (06)	1250 Secs (5000 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	 ***[1]*** ***[2]***

Orbit Structure





Visit

Proposal 16762, BST1054 - F814W orbits 5-6 (07), completed Tue Apr 26 21:00:21 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01

Comments: Visit 7 -third pair of orbits with ACS+F814W, and WFC3 parallel F606W. Observations within visit are in a 4 point subpixel dither box pattern to overcome bad/hot pixels. Using same box pattern between visits as with the F606W observations.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1-2)

Fixed Targets

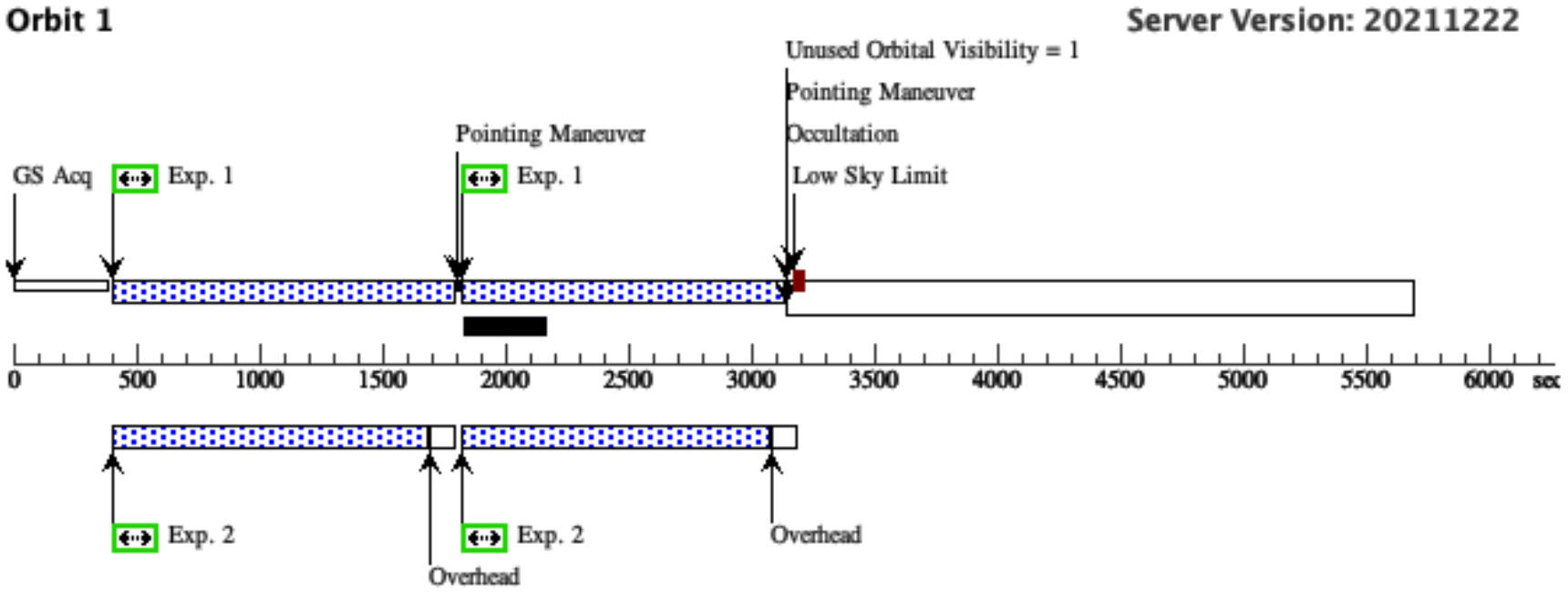
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BST1047+1156	RA: 10 47 43.8000 (161.9325000d) Dec: +11 56 1.00 (11.93361d) Equinox: J2000		V=26.0	Reference Frame: ICRS

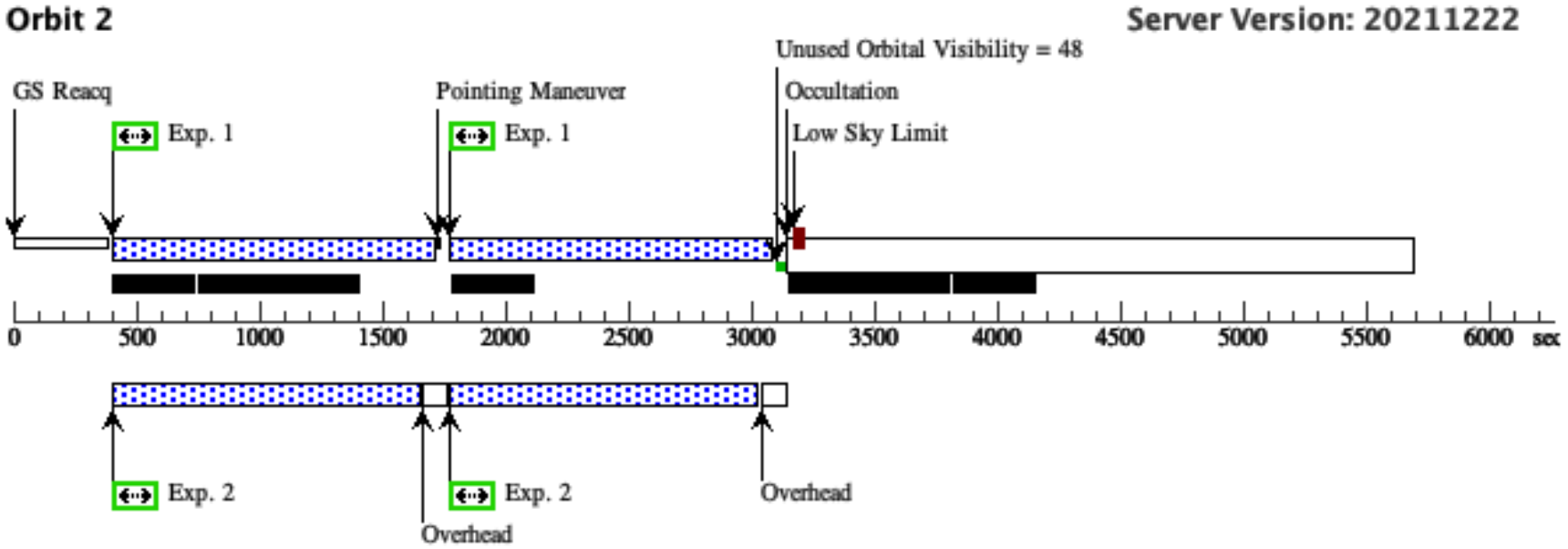
Comments:
Category=EXT-CLUSTER
Description=[STAR FORMING REGION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) BST1047+1156	ACS/WFC, ACCUM, WFC1	F814W		POS TARG 0.00,-0.98; LOW-SKY	Pattern 1, Exps 1-2 in BST1054 - F814W orbits 5-6 (07) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F814W orbits 5-6 (07)	1185 Secs (4740 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	 ***[1]*** ***[2]***
2		(1) BST1047+1156	WFC3/UVIS, ACCUM, UVIS-CENTER	F606W			Pattern 1, Exps 1-2 in BST1054 - F814W orbits 5-6 (07) (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in BST1054 - F814W orbits 5-6 (07)	1250 Secs (5000 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	 ***[1]*** ***[2]***

Orbit Structure





Visit

Proposal 16762, BST1054 - F814W orbit 7 (08), completed Tue Apr 26 21:00:21 GMT 2022

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 01

Comments: Visit 5 -single orbit with ACS+F814W, and WFC3 parallel F606W. Observations within visit are in a 2 point dither line pattern (mimicing half of dither-box used in previous visits) to overcome bad/hot pixels. Using same box pattern between visits as with the F606W observations.

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.262 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides= Center Pattern=false		(1-2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	BST1047+1156	RA: 10 47 43.8000 (161.9325000d) Dec: +11 56 1.00 (11.93361d) Equinox: J2000		V=26.0	Reference Frame: ICRS

Comments:
Category=EXT-CLUSTER
Description=[STAR FORMING REGION]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) BST1047+1156	ACS/WFC, ACCUM, WFC1	F814W		POS TARG -0.98,-0.98; LOW-SKY	Pattern 2, Exps 1-2 in BST1054 - F814W orbit 7 (08) (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in BST1054 - F814W orbit 7 (08)	1185 Secs (2370 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[1]***
2		(1) BST1047+1156	WFC3/UVIS, ACCUM, UVIS-CENTER	F606W			Pattern 2, Exps 1-2 in BST1054 - F814W orbit 7 (08) (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in BST1054 - F814W orbit 7 (08)	1250 Secs (2500 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[1]***

Orbit Structure