



17108 - Dissecting Early Universe Dust with Matched-Resolution Observations from HST, JWST, and ALMA

Cycle: 30, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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Ms. Katrina Litke (CoI)	University of Arizona
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Dr. Cassie Reuter (CoI)	University of Illinois at Urbana - Champaign

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) SPT0418-47	WFC3/IR	1	27-Jul-2023 11:00:40.0	yes
51	(1) SPT0418-47	WFC3/IR	1	27-Jul-2023 11:00:41.0	yes
02	(1) SPT0418-47	WFC3/IR	1	27-Jul-2023 11:00:41.0	yes
03	(1) SPT0418-47	WFC3/IR	1	27-Jul-2023 11:00:42.0	yes
04	(2) SPT2147-50	WFC3/IR	1	27-Jul-2023 11:00:42.0	yes
05	(2) SPT2147-50	WFC3/IR	1	27-Jul-2023 11:00:43.0	yes
06	(2) SPT2147-50	WFC3/IR	1	27-Jul-2023 11:00:43.0	yes
56	(2) SPT2147-50	WFC3/IR	1	27-Jul-2023 11:00:43.0	yes
07	(1) SPT0418-47	ACS/WFC	2	27-Jul-2023 11:00:44.0	yes
08	(1) SPT0418-47	ACS/WFC	2	27-Jul-2023 11:00:45.0	yes
09	(1) SPT0418-47	ACS/WFC	1	27-Jul-2023 11:00:45.0	yes
12	(2) SPT2147-50	ACS/WFC	2	27-Jul-2023 11:00:45.0	yes
13	(2) SPT2147-50	ACS/WFC	2	27-Jul-2023 11:00:46.0	yes
14	(2) SPT2147-50	ACS/WFC	1	27-Jul-2023 11:00:46.0	yes

18 Total Orbits Used

ABSTRACT

We propose deep ACS and WFC3 imaging of two IR-luminous lensed galaxies at $z \sim 4$ with 0.04-0.08" imaging of the dust emission from ALMA and approved panchromatic JWST imaging and IFU spectroscopy through the TEMPLATES Early Release Science program. These objects will immediately become some of the best characterized galaxies at high redshift, observed in virtually all typical SFR tracers at resolutions far beyond the unlensed diffraction limit. HST is the only facility capable of detecting and resolving the rest-UV emissions, filling a critical gap in existing data. The arrival of JWST imaging and spectroscopy later this year will enable comparisons of the distribution of star formation, stellar mass, stellar age, small and large dust grains, and other properties on highly resolved scales. Even without JWST, the HST data alone will allow for an unprecedented comparison between unobscured and obscured star formation traced by HST and ALMA on scales of 100-200pc. The HST data will allow us to place these objects in the context of the IRX-beta relation on spatial scales an order of magnitude finer than existing case studies, revealing whether and on what spatial scales geometric effects lead these dusty galaxies to fall far from the standard relations. The imminent addition of comprehensive JWST

Proposal 17108 (STScI Edit Number: 2, Created: Thursday, July 27, 2023 at 10:00:47 AM Eastern Standard Time) - Overview

data will allow us to test key assumptions in widely-used SED fitting codes and the effects of spatial resolution on recovered properties. These observations complement substantial investments of JWST and ALMA time, have high legacy value, and we waive the HST exclusive access period to allow the community to benefit from these unparalleled HST+JWST+ALMA datasets.

OBSERVING DESCRIPTION

This program will acquire deep ACS+WFC3 imaging of two IR-luminous lensed galaxies at $z \sim 4$. The goal is to spatially resolve the rest-UV emission of the background lensed sources, requiring careful removal of the much brighter foreground lens galaxies. For each target, we will observe to 5-orbit depth in ACS/F814W and 3-orbit depth in WFC3/F140W.

For WFC3 we separate the program into 6 single-orbit visits (3 per source). We use four dither positions with WFC3-IR-DITHER-BOX to sample the PSF. We use a slightly larger dither pattern than the default as used by the 3D-HST project, corresponding to pixel positions of (0,0), (10,3.5), (6.5,10), and (-3.5,6.5), because some bad pixels come in clumps. We do not dither over the IR blobs or dead spot. We use a simple SPARS50 with NSAMP=14 at each dither position to fill out the orbits.

For ACS we divide the 5-orbit depth for each source into 3 visits consisting of 2/2/1 orbit each. In the two-orbit visits we use the default 4-position ACS-WFC-DITHER-BOX pattern; the single-orbit visits implement the ACS-WFC-DITHER-LINE pattern corresponding to only the first two positions of the BOX pattern. We use small POSTARG offsets in two of the visits in each source in order to maximize the effective number of dither points should all visits be executed at the same ORIENT. We use the WFC1 aperture to place the target galaxies near the center of the FOV while minimizing CTE. This will maximize the overlap with upcoming JWST NIRCAM+MIRI imaging for possible ancillary science, but our primary goals do not require uniform sensitivity or coverage of the chip gap (some of this may be filled in by visits scheduled at different times and roll angles, but it is not required for our primary science). We use ~ 1250 s exposures at each dither position to fill out the orbits.

Proposal 17108 - SPT0418-47 WFC3-1 (01) - Dissecting Early Universe Dust with Matched-Resolution Observations from HST, JWST...

Visit	Proposal 17108, SPT0418-47 WFC3-1 (01), failed Thu Jul 27 15:00:47 GMT 2023				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: (none)				
Patterns	#	Primary Pattern		Secondary Pattern	Exposures
	(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=1.42 Line Spacing=0.919		Coordinate Frame=POS-TARG Pattern Orientation=17.370 Angle Between Sides=76.301 Center Pattern=false	(1)
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
	(1)	SPT0418-47	RA: 04 18 39.6700 (64.6652917d) Dec: -47 51 52.75 (-47.86465d) Equinox: J2000		V=20.0
Exposures	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES				
	#	Label	Target	Config,Mode,Aperture	Spectral Els.
	1	(1) SPT0418-47	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=14; SAMP-SEQ=SPAR S50
					Special Reqs. Groups Exp. Time (Total)/[Actual Dur.] Orbit
					Pattern 1, Exps 1-1 i n SPT0418-47 WFC 3-1 (01) (1)
					652.938154 Secs (2611.753 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]
Orbit Structure	Orbit 1 Server Version: 20220630				

Visit	Proposal 17108, SPT0418-47 WFC3-1 (51), implementation										Thu Jul 27 15:00:47 GMT 2023	
	Diagnostic Status: No Diagnostics											
	Scientific Instruments: WFC3/IR											
	Special Requirements: (none)											
Comments: HOPR repeat of visit 1												
Patterns	#	Primary Pattern				Secondary Pattern				Exposures		
	(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=1.42 Line Spacing=0.919				Coordinate Frame=POS-TARG Pattern Orientation=17.370 Angle Between Sides=76.301 Center Pattern=false				(1)		
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous			
	(1)	SPT0418-47	RA: 04 18 39.6700 (64.6652917d) Dec: -47 51 52.75 (-47.86465d) Equinox: J2000				V=20.0		Reference Frame: ICRS			
	Comments:											
	Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(1) SPT0418-47	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=14; SAMP-SEQ=SPAR S50		Pattern 1, Exps 1-1 in SPT0418-47 WFC3-1 (51) (1)	652.938154 Secs (2611.753 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]		[1]	
Orbit Structure	Orbit 1											
	Server Version: 20220630											

Proposal 17108 - SPT0418-47 WFC3-2 (02) - Dissecting Early Universe Dust with Matched-Resolution Observations from HST, JWST...

Visit	Proposal 17108, SPT0418-47 WFC3-2 (02), completed										Thu Jul 27 15:00:47 GMT 2023	
	Diagnostic Status: No Diagnostics											
	Scientific Instruments: WFC3/IR											
	Special Requirements: (none)											
Patterns	#	Primary Pattern				Secondary Pattern				Exposures		
	(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=1.42 Line Spacing=0.919				Coordinate Frame=POS-TARG Pattern Orientation=17.370 Angle Between Sides=76.301 Center Pattern=false				(1)		
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous			
	(1)	SPT0418-47	RA: 04 18 39.6700 (64.6652917d) Dec: -47 51 52.75 (-47.86465d) Equinox: J2000				V=20.0		Reference Frame: ICRS			
	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1		(1) SPT0418-47	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=14; SAMP-SEQ=SPAR S50		Pattern 1, Exps 1-1 in SPT0418-47 WFC3-2 (02) (1)	652.938154 Secs (2611.753 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]		[1]	
Orbit Structure	Orbit 1 Server Version: 20220630											
	050010001500200025003000350040004500500055006000 sec											

Proposal 17108 - SPT0418-47 WFC3-3 (03) - Dissecting Early Universe Dust with Matched-Resolution Observations from HST, JWST...

Visit	Proposal 17108, SPT0418-47 WFC3-3 (03), completed Thu Jul 27 15:00:47 GMT 2023				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: (none)				
Patterns	#	Primary Pattern		Secondary Pattern	Exposures
	(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=1.42 Line Spacing=0.919		Coordinate Frame=POS-TARG Pattern Orientation=17.370 Angle Between Sides=76.301 Center Pattern=false	(1)
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
	(1)	SPT0418-47	RA: 04 18 39.6700 (64.6652917d) Dec: -47 51 52.75 (-47.86465d) Equinox: J2000		V=20.0
Exposures	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES				
	#	Label	Target	Config,Mode,Aperture	Spectral Els.
	1	(1) SPT0418-47	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=14; SAMP-SEQ=SPAR S50
					Special Reqs. Groups Exp. Time (Total)/[Actual Dur.] Orbit
					Pattern 1, Exps 1-1 i n SPT0418-47 WFC 3-3 (03) (1)
					652.938154 Secs (2611.753 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]
Orbit Structure	Orbit 1 Server Version: 20220630				
	The diagram illustrates the orbit structure for Orbit 1, spanning from 0 to 6000 seconds. It shows the sequence of events: GS Acq (0-50s), Exp. 1 (50-100s), Pointing Maneuver (100-150s), Exp. 1 (150-200s), Pointing Maneuver (200-250s), Exp. 1 (250-300s), Pointing Maneuver (300-350s), Reconfig (350-400s), Occultation (400-450s), and Unused Orbital Visibility = 60 (450-550s). The timeline is marked with ticks every 500 seconds.				

Proposal 17108 - SPT2147-50 WFC3-1 (04) - Dissecting Early Universe Dust with Matched-Resolution Observations from HST, JWST...

Visit	Proposal 17108, SPT2147-50 WFC3-1 (04), completed										Thu Jul 27 15:00:47 GMT 2023
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: WFC3/IR										
	Special Requirements: (none)										
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=1.42 Line Spacing=0.919				Coordinate Frame=POS-TARG Pattern Orientation=17.370 Angle Between Sides=76.301 Center Pattern=false				(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(2)	SPT2147-50	RA: 21 47 18.9700 (326.8290417d) Dec: -50 35 54.50 (-50.59847d) Equinox: J2000				V=20.0		Reference Frame: ICRS		
	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1		(2) SPT2147-50	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=14; SAMP-SEQ=SPAR S50		Pattern 1, Exps 1-1 in SPT2147-50 WFC3-1 (04) (1)	652.938154 Secs (2611.753 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[1]	
Orbit Structure	Orbit 1 Server Version: 20220630										

Proposal 17108 - SPT2147-50 WFC3-2 (05) - Dissecting Early Universe Dust with Matched-Resolution Observations from HST, JWST...

Visit	Proposal 17108, SPT2147-50 WFC3-2 (05), scheduling										Thu Jul 27 15:00:47 GMT 2023
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: WFC3/IR										
	Special Requirements: (none)										
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=1.42 Line Spacing=0.919				Coordinate Frame=POS-TARG Pattern Orientation=17.370 Angle Between Sides=76.301 Center Pattern=false				(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(2)	SPT2147-50	RA: 21 47 18.9700 (326.8290417d) Dec: -50 35 54.50 (-50.59847d) Equinox: J2000				V=20.0		Reference Frame: ICRS		
	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(2) SPT2147-50	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=14; SAMP-SEQ=SPAR S50		Pattern 1, Exps 1-1 i n SPT2147-50 WFC 3-2 (05) (1)	652.938154 Secs (2611.753 Secs)		[1]
									[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]		
Orbit Structure	Orbit 1 Server Version: 20220630										

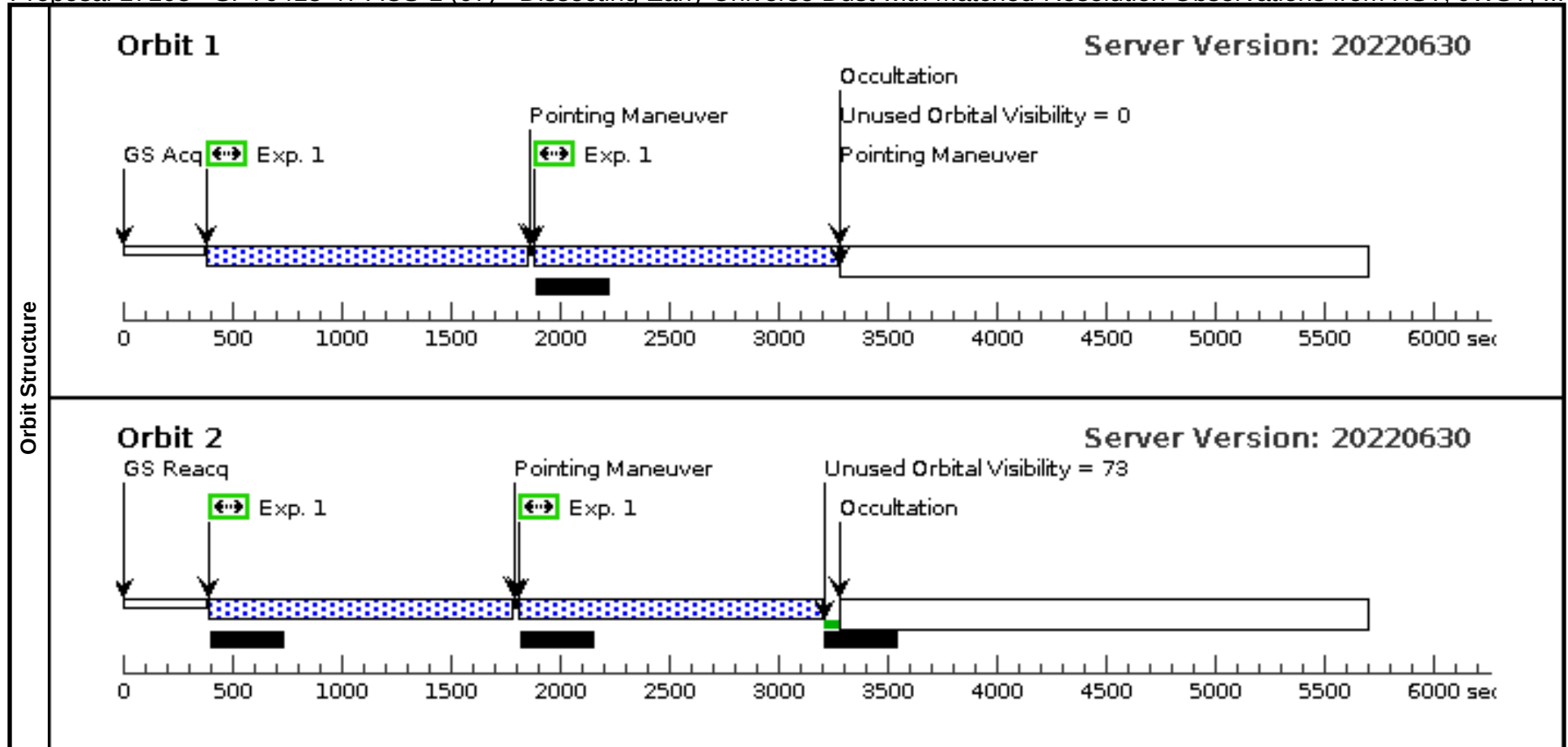
Proposal 17108 - SPT2147-50 WFC3-3 (06) - Dissecting Early Universe Dust with Matched-Resolution Observations from HST, JWST...

Visit	Proposal 17108, SPT2147-50 WFC3-3 (06), failed										Thu Jul 27 15:00:47 GMT 2023
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: WFC3/IR										
	Special Requirements: (none)										
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=1.42 Line Spacing=0.919				Coordinate Frame=POS-TARG Pattern Orientation=17.370 Angle Between Sides=76.301 Center Pattern=false				(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(2)	SPT2147-50	RA: 21 47 18.9700 (326.8290417d) Dec: -50 35 54.50 (-50.59847d) Equinox: J2000				V=20.0		Reference Frame: ICRS		
	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(2) SPT2147-50	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=14; SAMP-SEQ=SPAR S50		Pattern 1, Exps 1-1 in SPT2147-50 WFC3-3 (06) (1)	652.938154 Secs (2611.753 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]		[1]
Orbit Structure	Orbit 1 Server Version: 20220630 GS Acq Exp. 1 Pointing Maneuver Exp. 1 Pointing Maneuver Exp. 1 Pointing Maneuver Exp. 1 Reconfig Occultation Unused Orbital Visibility = 108 0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 sec										

Visit	Proposal 17108, SPT2147-50 WFC3-3 (56) Thu Jul 27 15:00:47 GMT 2023				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: (none) Comments: HOPR Repeat of visit 6				
Patterns	#	Primary Pattern		Secondary Pattern	Exposures
	(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=1.42 Line Spacing=0.919 Coordinate Frame=POS-TARG Pattern Orientation=17.370 Angle Between Sides=76.301 Center Pattern=false			(1)
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
	(2)	SPT2147-50	RA: 21 47 18.9700 (326.8290417d) Dec: -50 35 54.50 (-50.59847d) Equinox: J2000		V=20.0
	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES Miscellaneous: Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.
	1	(2) SPT2147-50		WFC3/IR, MULTIACCUM, IR	F140W
				NSAMP=14; SAMP-SEQ=SPAR S50	
				Special Reqs.	Groups
					Pattern 1, Exps 1-1 in SPT2147-50 WFC3-3 (56) (1)
					Exp. Time (Total)/[Actual Dur.]
					652.938154 Secs (2611.753 Secs)
					[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]
					[1]
Orbit Structure	Orbit 1 Server Version: 20220630				
	The diagram illustrates the orbit structure for Orbit 1, spanning from 0 to 6000 seconds. It shows the sequence of events: GS Acq (0-50s), Exp. 1 (50-100s), Pointing Maneuver (100-150s), Exp. 1 (150-200s), Pointing Maneuver (200-250s), Exp. 1 (250-300s), Pointing Maneuver (300-350s), Reconfig (350-400s), Occultation (400-450s), and a long period of Unused Orbital Visibility (450-6000s). The timeline is marked with ticks every 500 seconds.				

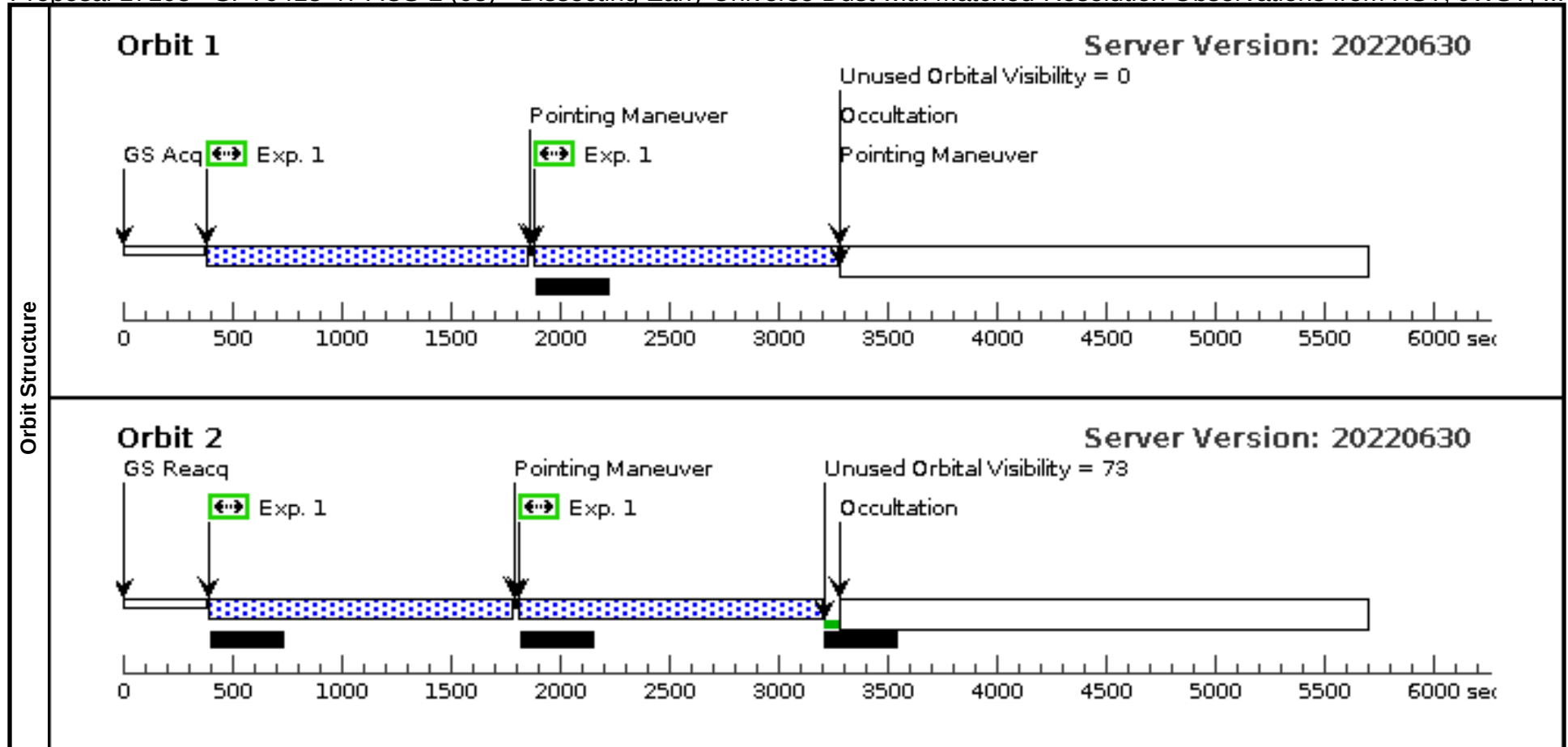
Proposal 17108 - SPT0418-47 ACS-1 (07) - Dissecting Early Universe Dust with Matched-Resolution Observations from HST, JWST, ...

Visit	Proposal 17108, SPT0418-47 ACS-1 (07), completed										Thu Jul 27 15:00:47 GMT 2023	
	Diagnostic Status: No Diagnostics											
	Scientific Instruments: ACS/WFC											
	Special Requirements: (none)											
Patterns	#	Primary Pattern				Secondary Pattern				Exposures		
	(2)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.2637 Line Spacing=0.1856		Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.02 Center Pattern=false						(1)		
Fixed Targets	#	Name		Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(1)	SPT0418-47		RA: 04 18 39.6700 (64.6652917d) Dec: -47 51 52.75 (-47.86465d) Equinox: J2000				V=20.0		Reference Frame: ICRS		
	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES											
Exposures	#	Label	Target	Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(1) SPT0418-47	ACS/WFC, ACCUM, WFC1		F814W			Pattern 2, Exps 1-1 in SPT0418-47 ACS-1 (07) (2)	1262 Secs (5048 Secs)		
										[==>(Pattern 1)]		[1]
										[==>(Pattern 2)]		
											[==>(Pattern 3)]	
										[==>(Pattern 4)]		



Proposal 17108 - SPT0418-47 ACS-2 (08) - Dissecting Early Universe Dust with Matched-Resolution Observations from HST, JWST, ...

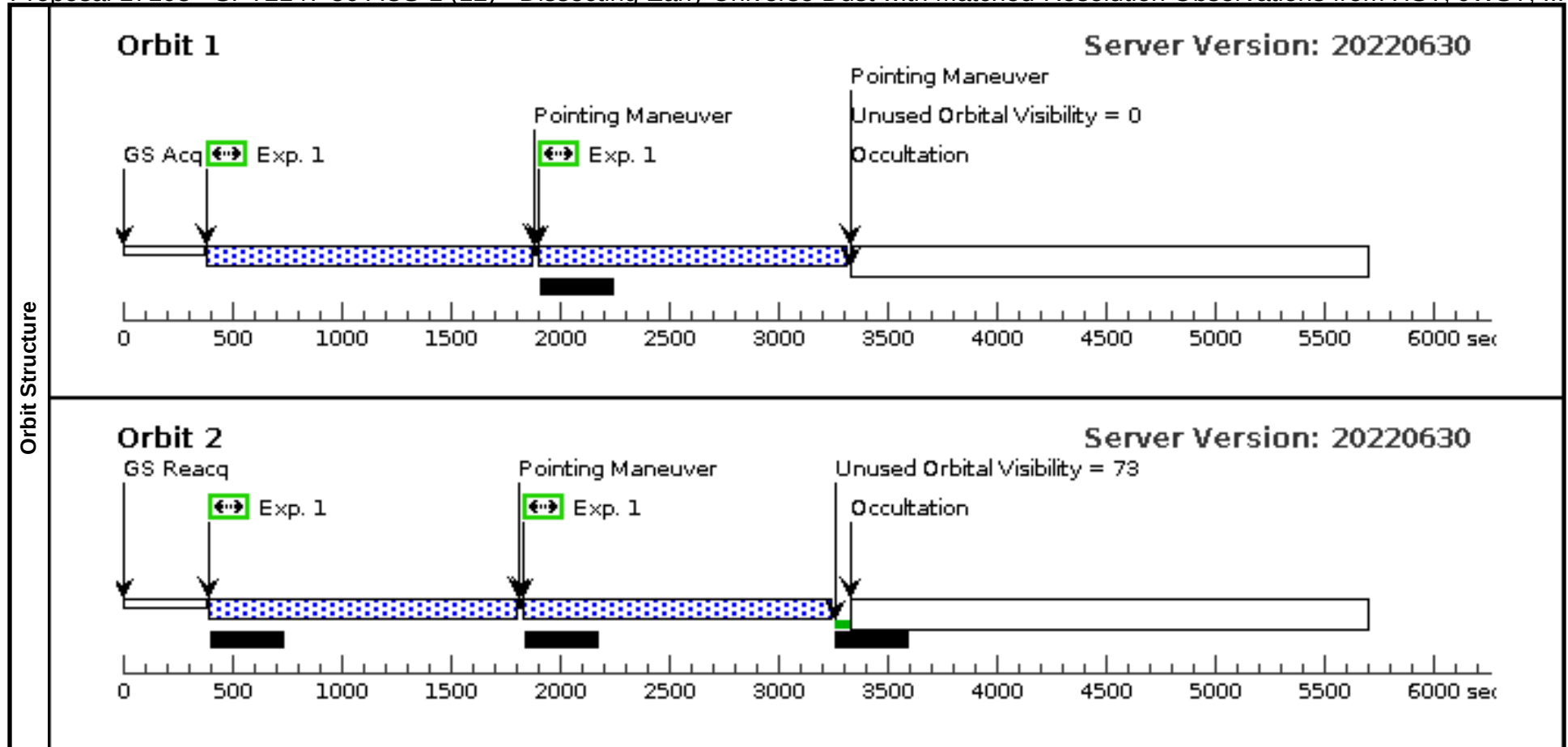
Visit	Proposal 17108, SPT0418-47 ACS-2 (08), completed								Thu Jul 27 15:00:47 GMT 2023			
	Diagnostic Status: No Diagnostics											
	Scientific Instruments: ACS/WFC											
	Special Requirements: (none)											
Patterns	#	Primary Pattern				Secondary Pattern				Exposures		
	(2)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.2637 Line Spacing=0.1856		Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.02 Center Pattern=false						(1)		
Fixed Targets	#	Name		Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(1)	SPT0418-47		RA: 04 18 39.6700 (64.6652917d) Dec: -47 51 52.75 (-47.86465d) Equinox: J2000				V=20.0		Reference Frame: ICRS		
	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES											
Exposures	#	Label	Target	Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(1) SPT0418-47	ACS/WFC, ACCUM, WFC1		F814W		POS TARG +0.12,+0.12	Pattern 2, Exps 1-1 in SPT0418-47 ACS-2 (08) (2)	1262 Secs (5048 Secs)		
										[==>(Pattern 1)]		[1]
										[==>(Pattern 2)]		
											[==>(Pattern 3)]	
										[==>(Pattern 4)]		



Visit	Proposal 17108, SPT0418-47 ACS-3 (09), completed Thu Jul 27 15:00:47 GMT 2023				
	Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)				
Patterns	#	Primary Pattern		Secondary Pattern	Exposures
	(3)	Pattern Type=ACS-WFC-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.2637 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides= Center Pattern=false			(1)
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes
	(1)	SPT0418-47	RA: 04 18 39.6700 (64.6652917d) Dec: -47 51 52.75 (-47.86465d) Equinox: J2000		V=20.0
Fixed Targets	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES				
	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.
	1	(1) SPT0418-47	ACS/WFC, ACCUM, WFC1	F814W	POS TARG -0.12,-0.12
Exposures					Special Reqs.
					Pattern 3, Exps 1-1 in SPT0418-47 ACS-3 (09) (3)
Exposures					Exp. Time (Total)/[Actual Dur.]
					1262 Secs (2524 Secs)
Exposures					[=>(Pattern 1)]
					[=>(Pattern 2)]
Orbit Structure					Orbit
					[1]
Orbit Structure	Orbit 1 Server Version: 20220630				
	GS Acq Exp. 1 Pointing Maneuver Exp. 1 Occultation Unused Orbital Visibility = 0 0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 sec				

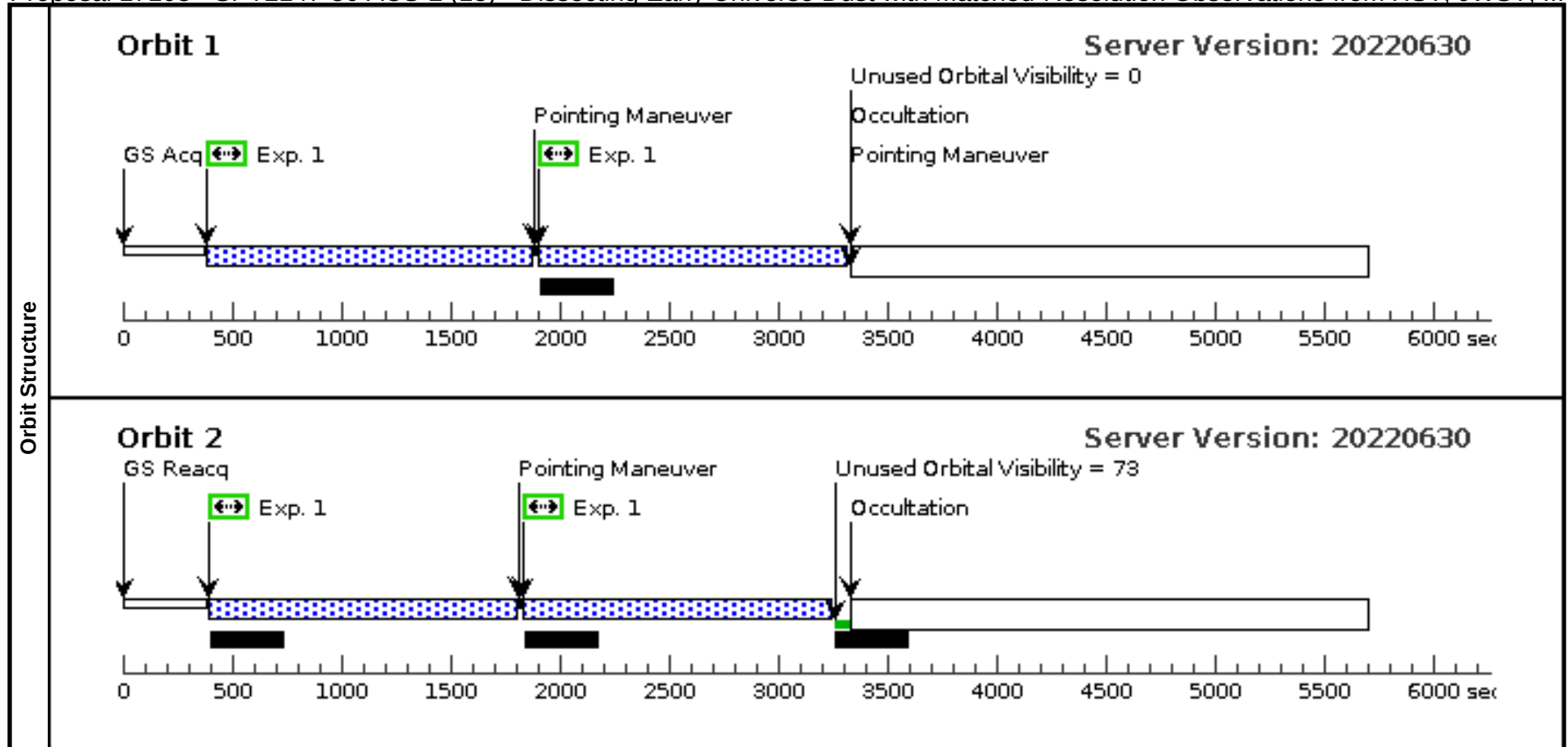
Proposal 17108 - SPT2147-50 ACS-1 (12) - Dissecting Early Universe Dust with Matched-Resolution Observations from HST, JWST, ...

Visit	Proposal 17108, SPT2147-50 ACS-1 (12), completed										Thu Jul 27 15:00:47 GMT 2023
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: ACS/WFC										
	Special Requirements: (none)										
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(2)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.2637 Line Spacing=0.1856		Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.02 Center Pattern=false						(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(2)	SPT2147-50	RA: 21 47 18.9700 (326.8290417d) Dec: -50 35 54.50 (-50.59847d) Equinox: J2000				V=20.0		Reference Frame: ICRS		
	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(2) SPT2147-50	ACS/WFC, ACCUM, WFC1	F814W			Pattern 2, Exps 1-1 i n SPT2147-50 ACS- 1 (12) (2)	1286 Secs (5144 Secs)		
									[==>(Pattern 1)]		[1]
									[==>(Pattern 2)]		
										[==>(Pattern 3)]	
									[==>(Pattern 4)]		



Proposal 17108 - SPT2147-50 ACS-2 (13) - Dissecting Early Universe Dust with Matched-Resolution Observations from HST, JWST, ...

Visit	Proposal 17108, SPT2147-50 ACS-2 (13), completed										Thu Jul 27 15:00:47 GMT 2023
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: ACS/WFC										
	Special Requirements: (none)										
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(2)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.2637 Line Spacing=0.1856		Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.02 Center Pattern=false						(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(2)	SPT2147-50	RA: 21 47 18.9700 (326.8290417d) Dec: -50 35 54.50 (-50.59847d) Equinox: J2000				V=20.0		Reference Frame: ICRS		
Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(2) SPT2147-50	ACS/WFC, ACCUM, WFC1	F814W		POS TARG +0.12,+0.12	Pattern 2, Exps 1-1 in SPT2147-50 ACS-2 (13) (2)	1286 Secs (5144 Secs)		
									[==>(Pattern 1)]		[1]
									[==>(Pattern 2)]		
										[==>(Pattern 3)]	
									[==>(Pattern 4)]		



Visit	Proposal 17108, SPT2147-50 ACS-3 (14), completed										Thu Jul 27 15:00:47 GMT 2023
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: ACS/WFC										
	Special Requirements: (none)										
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(3)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.2637 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides= Center Pattern=false								(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(2)	SPT2147-50	RA: 21 47 18.9700 (326.8290417d) Dec: -50 35 54.50 (-50.59847d) Equinox: J2000				V=20.0		Reference Frame: ICRS		
	Comments: Category=GALAXY Description=[GRAVITATIONAL LENS, HIGH REDSHIFT GALAXY, STARBURST, ULTRALUMINOUS IR GAL] Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(2) SPT2147-50	ACS/WFC, ACCUM, WFC1	F814W		POS TARG -0.12,-0.12	Pattern 3, Exps 1-1 in SPT2147-50 ACS-3 (14) (3)	1286 Secs (2572 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[1]
Orbit Structure	Orbit 1 Server Version: 20220630 GS Acq Exp. 1 Pointing Maneuver Exp. 1 Unused Orbital Visibility = 0 Occultation 0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 sec										