



18423 - Probing the Origin of the UV Continuum in Local LRD Analogs with HST Polarimetry

Cycle: 34, Proposal Category: GO
(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
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Prof. Christian Knigge (CoI) (ESA Member)	University of Southampton
Dr. Mengtao Tang (CoI)	Shanghai Jiao Tong University
Dr. Jianwei Lyu (CoI) (AdminUSPI)	University of Arizona
Prof. Manda Banerji (CoI) (ESA Member)	University of Southampton

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) SDSS-J102208.52+084156.1	ACS/WFC	3	14-Aug-2026 17:00:19.0	yes
02	(2) 2MASS-J10253030+1402078	ACS/WFC	3	14-Aug-2026 17:00:21.0	yes
03	(3) SDSS-J104755.92+073951.2	ACS/WFC	3	14-Aug-2026 17:00:22.0	yes

9 Total Orbits Used

ABSTRACT

Little Red Dots (LRDs) discovered by JWST may represent a key phase of early black hole and galaxy growth, yet their physical nature remains uncertain. A promising framework invokes an accreting black hole embedded in a dense gas envelope, which can explain many of the key observed

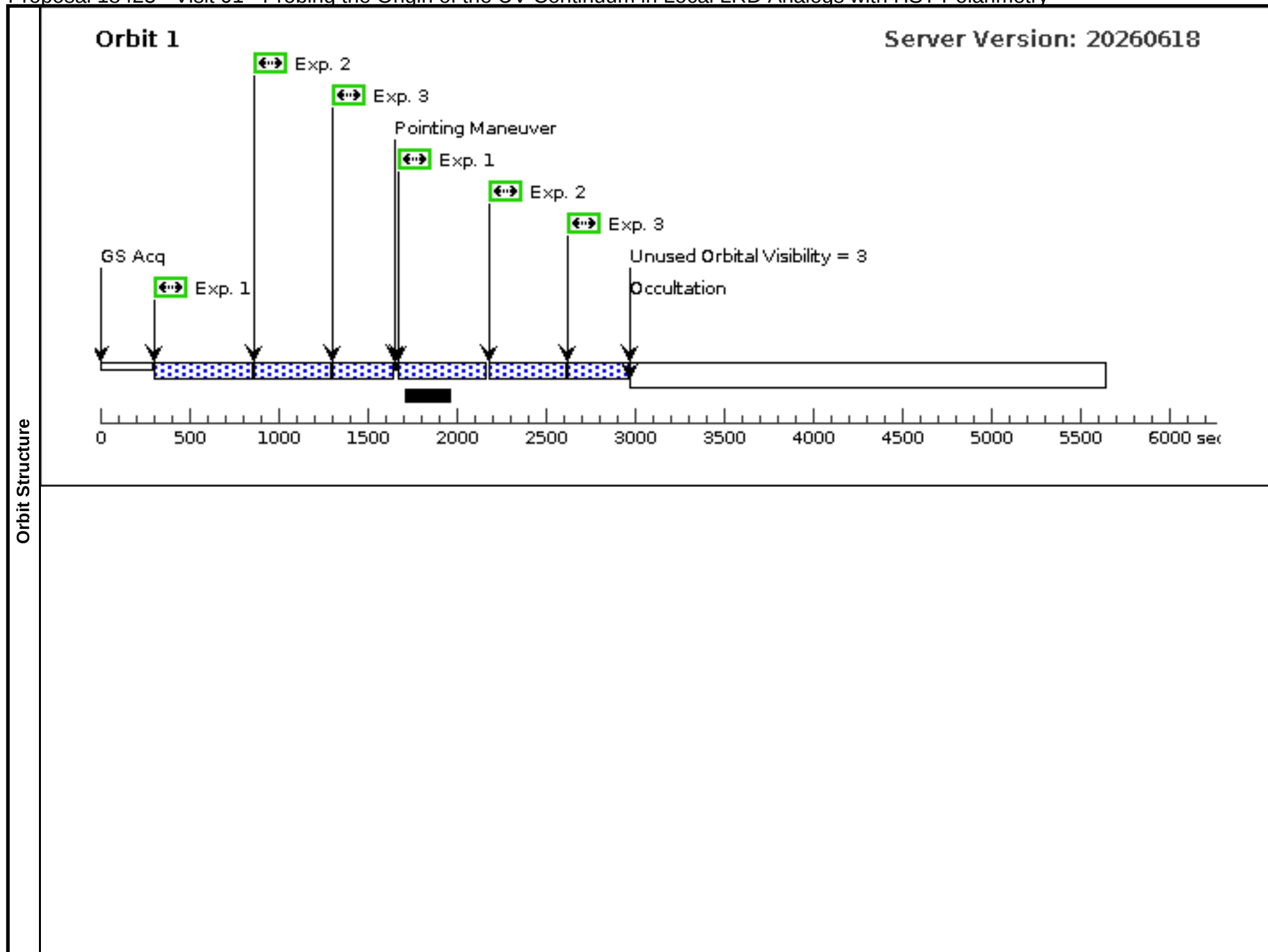
properties of LRDs from the optical to the infrared. However, the origin of the rest-UV continuum remains unresolved: it may arise from a compact nuclear stellar population, or from AGN radiation escaping through a clumpy envelope after multiple scatterings. We propose HST/ACS imaging polarimetry for three recently identified local LRD analogs at redshifts of 0.1--0.2. Using F475W, F606W and F775W, we will measure the nuclear polarization on the blue and red sides of the Balmer break while minimizing the extended host-galaxy dilution through HST's high spatial resolution. A significant polarization excess in the blue continuum would provide strong evidence for scattered AGN light and support a role for electron scattering in shaping LRD spectra. This program will provide the first direct polarimetric constraint on the origin of the UV continuum in LRD analogs and help assess how reliably the physical properties of high-redshift LRDs can be inferred.

OBSERVING DESCRIPTION

Polarimetric observation using ACS/WFC

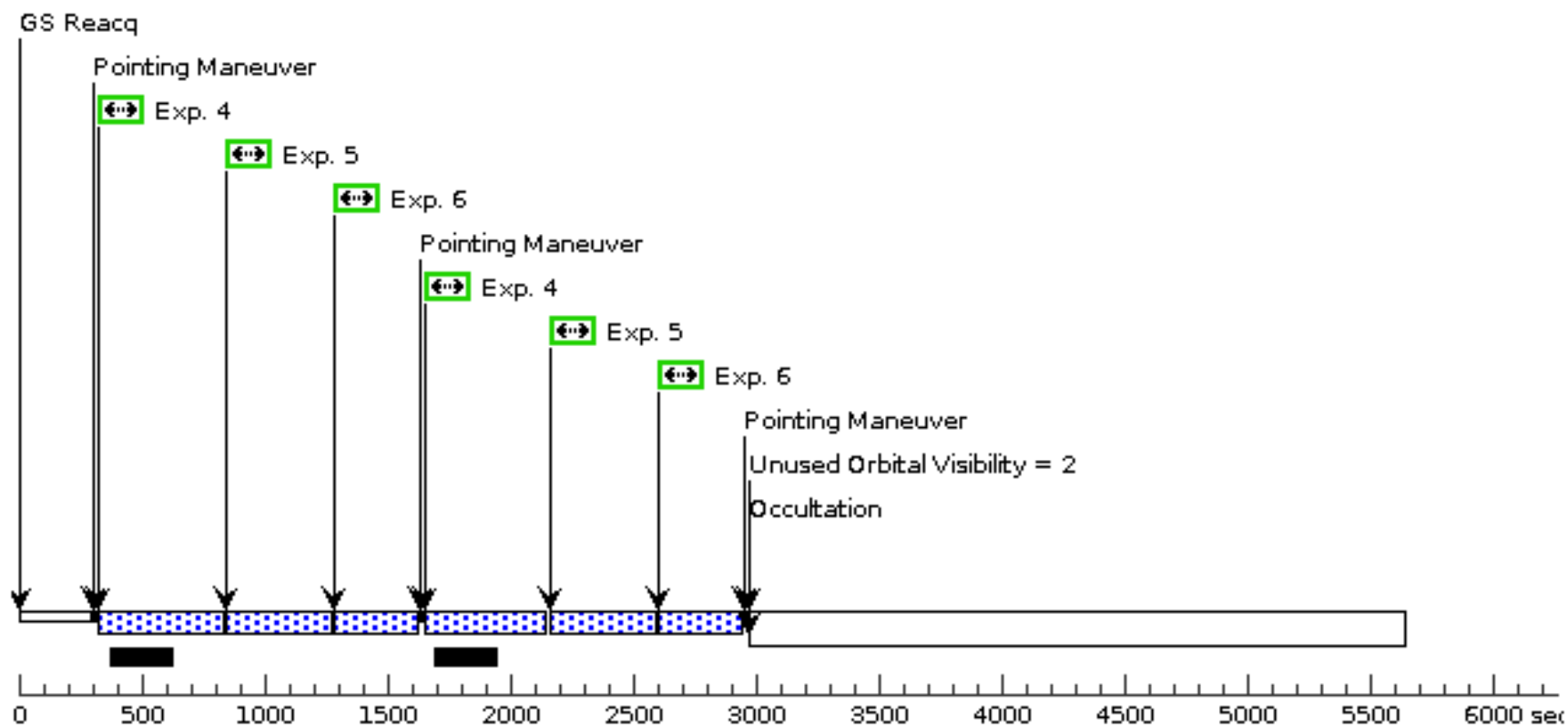
Proposal 18423 - Visit 01 - Probing the Origin of the UV Continuum in Local LRD Analogs with HST Polarimetry

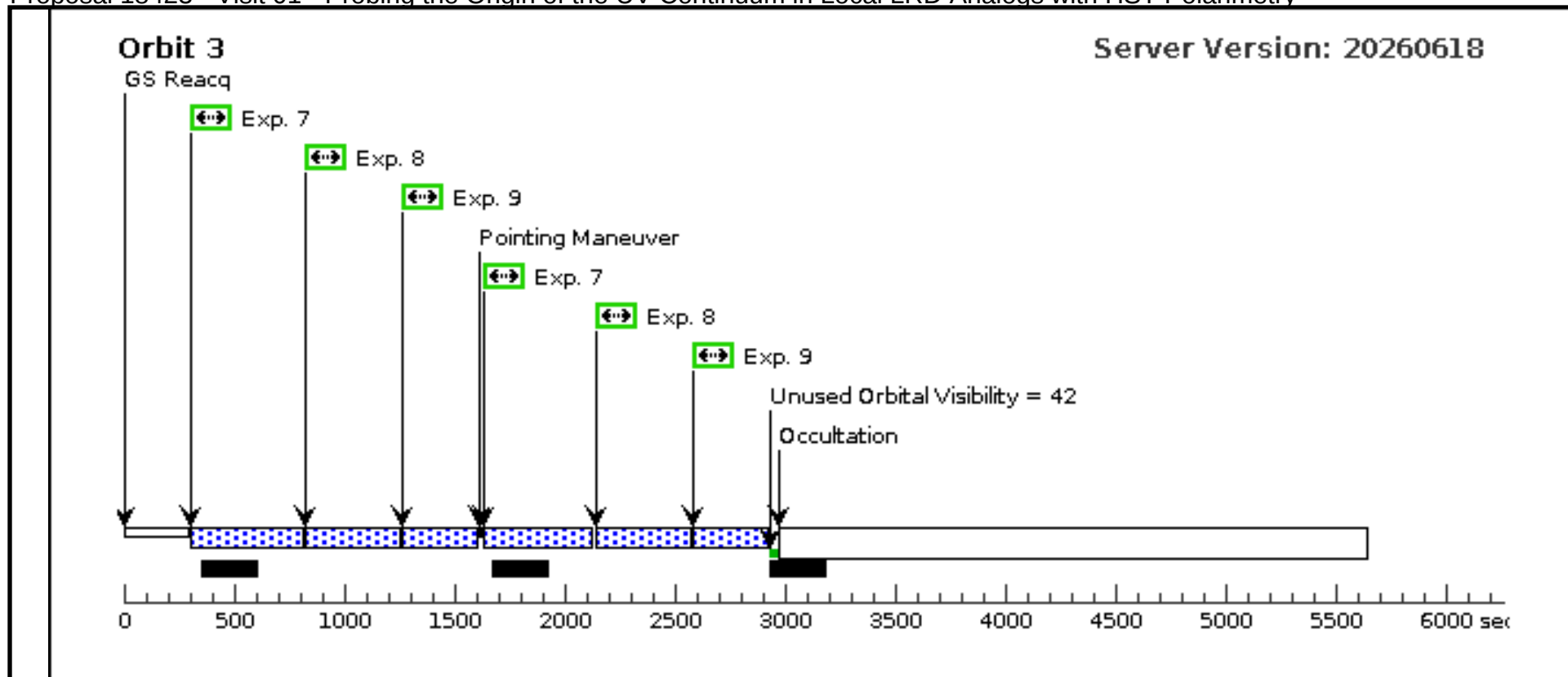
Visit	Proposal 18423, Visit 01										Fri Aug 14 21:00:23 GMT 2026			
	Diagnostic Status: No Diagnostics													
	Scientific Instruments: ACS/WFC													
	Special Requirements: (none)													
Patterns	#	Primary Pattern					Secondary Pattern					Exposures		
	(2)	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=1 Line Spacing=			Coordinate Frame=POS-TARG Pattern Orientation=0 Angle Between Sides= Center Pattern=false							(1-3), (4-6), (7-9)		
Fixed Targets	#	Name		Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous				
	(1)	SDSS-J102208.52+084156.1		RA: 10 22 8.5288 (155.5355367d) Dec: +08 41 56.20 (8.69894d) Equinox: J2000		Epoch of Position: 2000		V=20.73		Reference Frame: ICRS				
Comments: Category=GALAXY Description=[QSO]														
Exposures	#	Label	Target	Config,Mode,Aperture		Spectral Els.		Opt. Params.	Special Reqs.	Groups		Exp. Time (Total)/[Actual Dur.]		Orbit
	1	POL0-475	(1) SDSS-J102208.52+084156.1	ACS/WFC, ACCUM, WFC		F475W POL0V				Pattern 2, Exps 1-3 in Visit 01 (2)		342 Secs (684 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[1]
	2	POL0-606	(1) SDSS-J102208.52+084156.1	ACS/WFC, ACCUM, WFC		F606W POL0V				Pattern 2, Exps 1-3 in Visit 01 (2)		273 Secs (546 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[1]
	3	POL0-775	(1) SDSS-J102208.52+084156.1	ACS/WFC, ACCUM, WFC		F775W POL0V				Pattern 2, Exps 1-3 in Visit 01 (2)		168 Secs (336 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[1]
	4	POL60-475	(1) SDSS-J102208.52+084156.1	ACS/WFC, ACCUM, WFC		F475W POL60V				Pattern 2, Exps 4-6 in Visit 01 (2)		342 Secs (684 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[2]
	5	POL60-606	(1) SDSS-J102208.52+084156.1	ACS/WFC, ACCUM, WFC		F606W POL60V				Pattern 2, Exps 4-6 in Visit 01 (2)		273 Secs (546 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[2]
	6	POL60-775	(1) SDSS-J102208.52+084156.1	ACS/WFC, ACCUM, WFC		F775W POL60V				Pattern 2, Exps 4-6 in Visit 01 (2)		168 Secs (336 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[2]
	7	POL120-475	(1) SDSS-J102208.52+084156.1	ACS/WFC, ACCUM, WFC		F475W POL120V				Pattern 2, Exps 7-9 in Visit 01 (2)		342 Secs (684 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[3]
	8	POL120-606	(1) SDSS-J102208.52+084156.1	ACS/WFC, ACCUM, WFC		F606W POL120V				Pattern 2, Exps 7-9 in Visit 01 (2)		273 Secs (546 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[3]
	9	POL120-775	(1) SDSS-J102208.52+084156.1	ACS/WFC, ACCUM, WFC		F775W POL120V				Pattern 2, Exps 7-9 in Visit 01 (2)		168 Secs (336 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[3]



Orbit 2

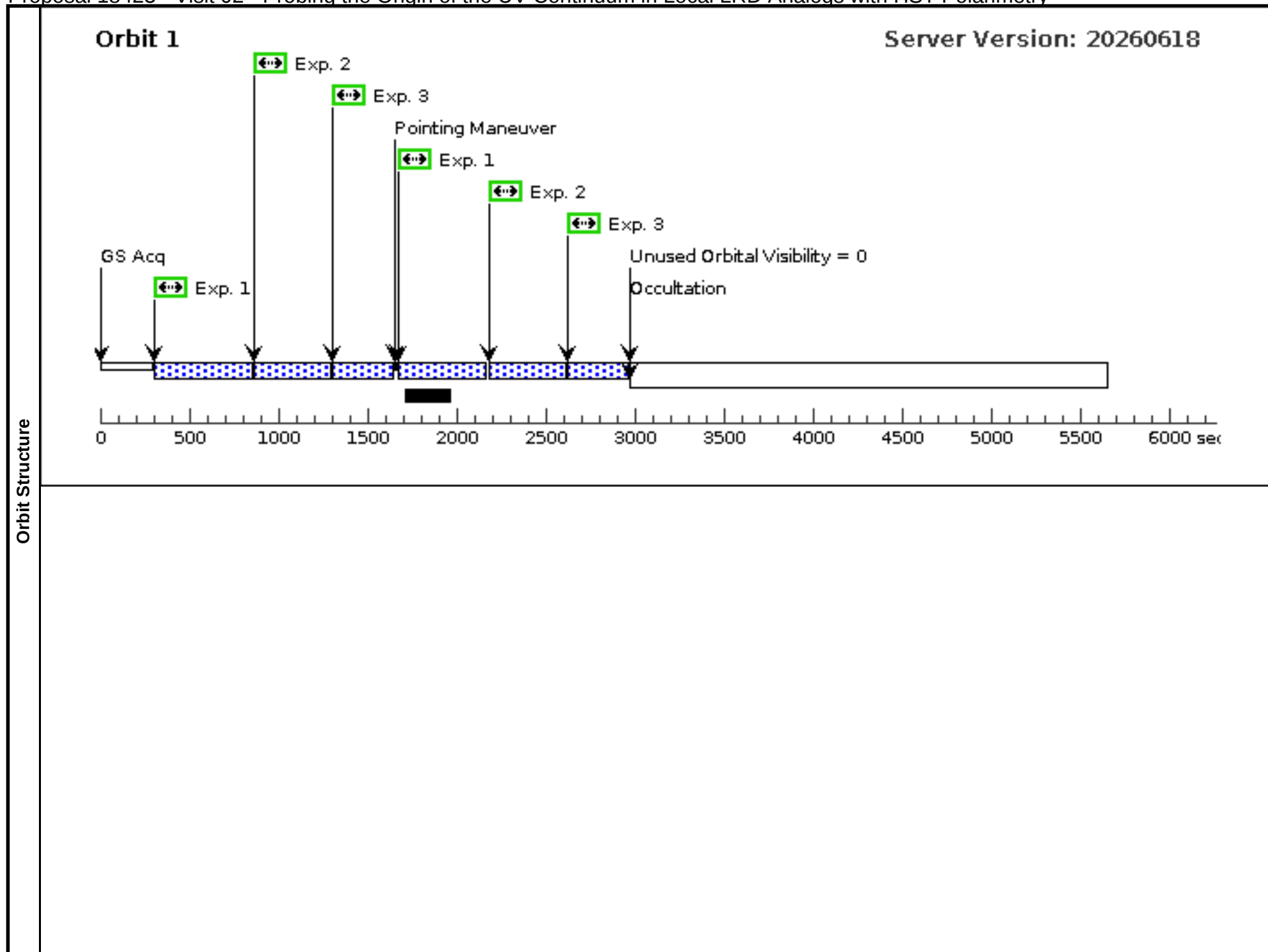
Server Version: 20260618





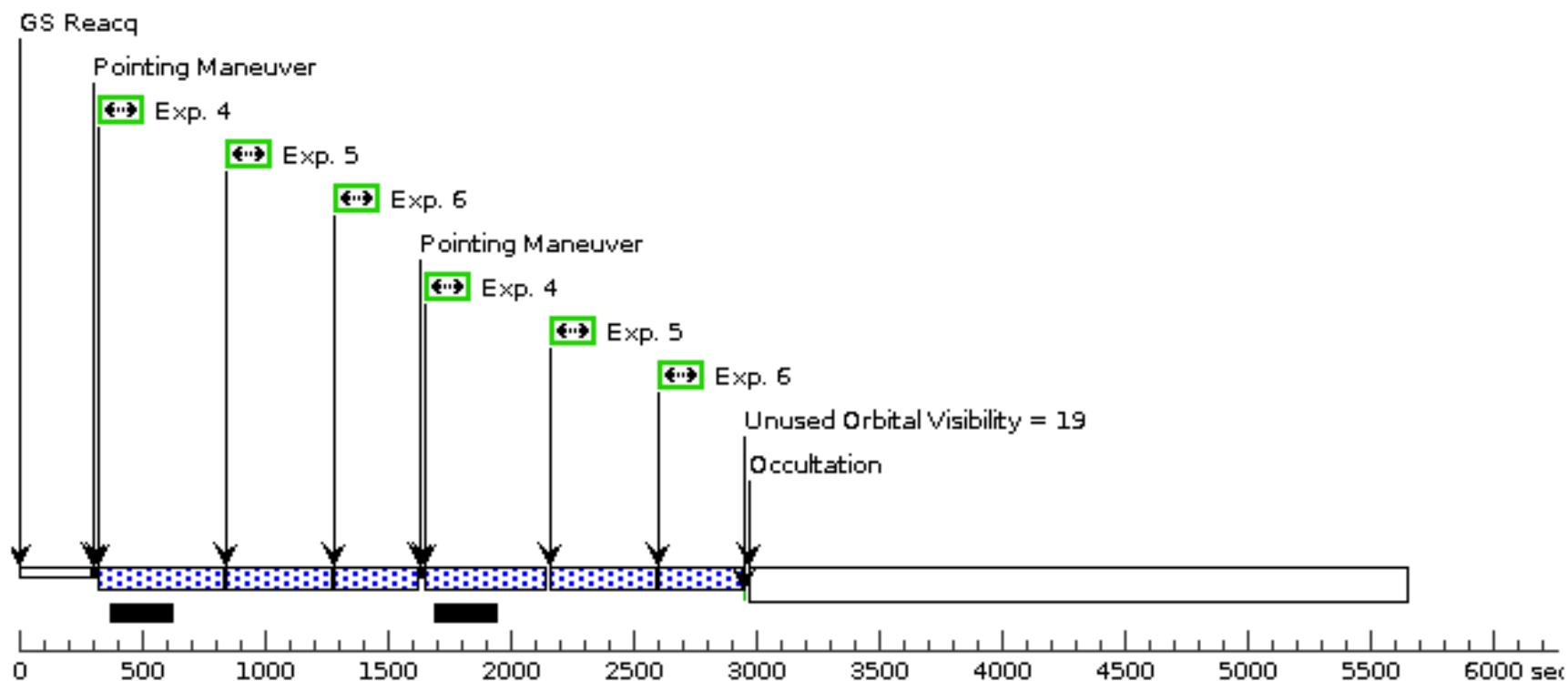
Proposal 18423 - Visit 02 - Probing the Origin of the UV Continuum in Local LRD Analogs with HST Polarimetry

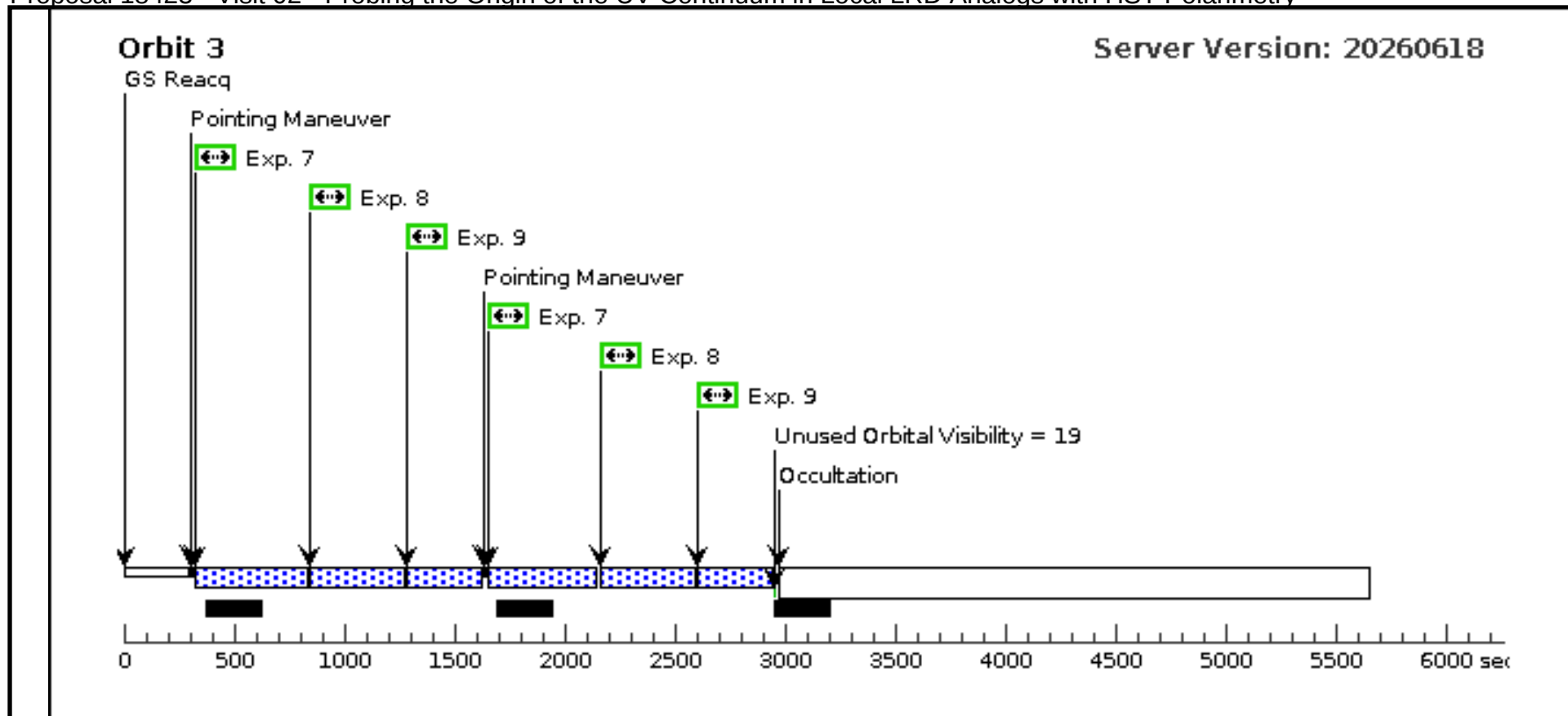
Visit	Proposal 18423, Visit 02										Fri Aug 14 21:00:23 GMT 2026						
	Diagnostic Status: No Diagnostics																
	Scientific Instruments: ACS/WFC																
	Special Requirements: (none)																
Patterns	#	Primary Pattern				Secondary Pattern				Exposures							
	(2)	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=1 Line Spacing=		Coordinate Frame=POS-TARG Pattern Orientation=0 Angle Between Sides= Center Pattern=false						(1-3), (4-6), (7-9)							
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous								
	(2)	2MASS-J10253030+1402078	RA: 10 25 30.2924 (156.3762183d) Dec: +14 02 7.39 (14.03539d) Equinox: J2000		Epoch of Position: 2000		V=19.77		Reference Frame: ICRS								
Comments: Category=GALAXY Description=[QSO]																	
Exposures	#	Label	Target	Config,Mode,Aperture		Spectral Els.		Opt. Params.		Special Reqs.		Groups		Exp. Time (Total)/[Actual Dur.]		Orbit	
	1	POL0-475	(2) 2MASS-J10253030+1402078	ACS/WFC, ACCUM, WFC		F475W POL0V						Pattern 2, Exps 1-3 in Visit 02 (2)		342 Secs (684 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[1]	
	2	POL0-606	(2) 2MASS-J10253030+1402078	ACS/WFC, ACCUM, WFC		F606W POL0V						Pattern 2, Exps 1-3 in Visit 02 (2)		273 Secs (546 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[1]	
	3	POL0-775	(2) 2MASS-J10253030+1402078	ACS/WFC, ACCUM, WFC		F775W POL0V						Pattern 2, Exps 1-3 in Visit 02 (2)		168 Secs (336 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[1]	
	4	POL60-475	(2) 2MASS-J10253030+1402078	ACS/WFC, ACCUM, WFC		F475W POL60V						Pattern 2, Exps 4-6 in Visit 02 (2)		342 Secs (684 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[2]	
	5	POL60-606	(2) 2MASS-J10253030+1402078	ACS/WFC, ACCUM, WFC		F606W POL60V						Pattern 2, Exps 4-6 in Visit 02 (2)		273 Secs (546 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[2]	
	6	POL60-775	(2) 2MASS-J10253030+1402078	ACS/WFC, ACCUM, WFC		F775W POL60V						Pattern 2, Exps 4-6 in Visit 02 (2)		168 Secs (336 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[2]	
	7	POL120-475	(2) 2MASS-J10253030+1402078	ACS/WFC, ACCUM, WFC		F475W POL120V						Pattern 2, Exps 7-9 in Visit 02 (2)		342 Secs (684 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[3]	
	8	POL120-606	(2) 2MASS-J10253030+1402078	ACS/WFC, ACCUM, WFC		F606W POL120V						Pattern 2, Exps 7-9 in Visit 02 (2)		273 Secs (546 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[3]	
	9	POL120-775	(2) 2MASS-J10253030+1402078	ACS/WFC, ACCUM, WFC		F775W POL120V						Pattern 2, Exps 7-9 in Visit 02 (2)		168 Secs (336 Secs) [==>(Pattern 1)] [==>(Pattern 2)]		[3]	



Orbit 2

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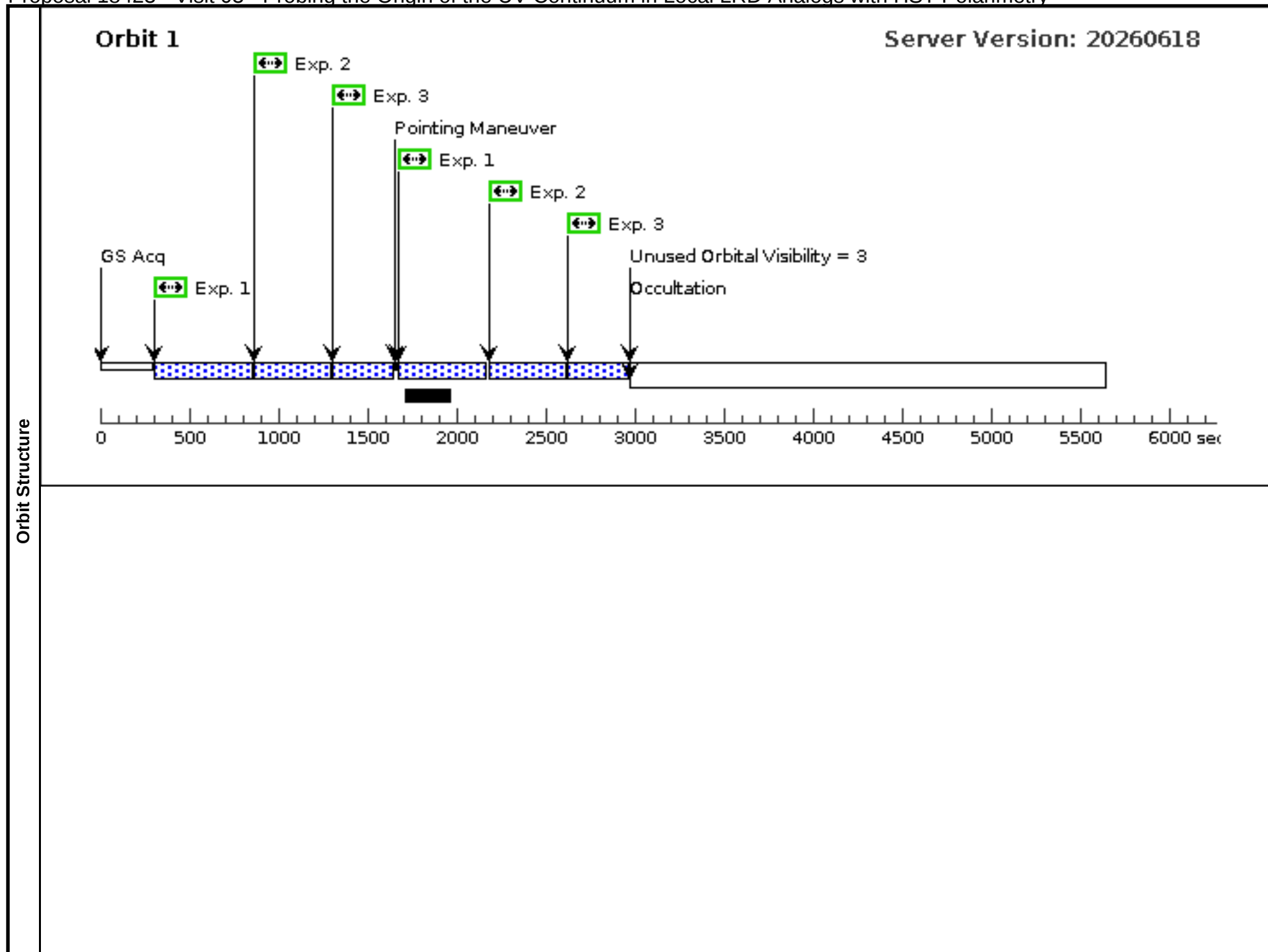


Proposal 18423 - Visit 03 - Probing the Origin of the UV Continuum in Local LRD Analogs with HST Polarimetry

Visit	Proposal 18423, Visit 03					Fri Aug 14 21:00:23 GMT 2026
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	Scientific Instruments: ACS/WFC					
	Special Requirements: (none)					
Patterns	#	Primary Pattern		Secondary Pattern		Exposures
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Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(3)	SDSS- J104755.92+073951.2	RA: 10 47 55.9248 (161.9830200d) Dec: +07 39 51.23 (7.66423d) Equinox: J2000	Proper Motion RA: 0.662 mas/yr Proper Motion Dec: 0.084 mas/yr Parallax: 2.907E-4" Epoch of Position: 2000	V=19.81	Reference Frame: ICRS
	Comments: The PM is within error = 0					
	Category=GALAXY					
Description=[QSO]						

Proposal 18423 - Visit 03 - Probing the Origin of the UV Continuum in Local LRD Analogs with HST Polarimetry

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	POL0-475	(3) SDSS-J104755.9 2+073951.2	ACS/WFC, ACCUM, WFC	F475W POL0V			Pattern 2, Exps 1-3 in Visit 03 (2)	342 Secs (684 Secs) [==>(Pattern 1)] [==>(Pattern 2)]	[1]
	2	POL0-606	(3) SDSS-J104755.9 2+073951.2	ACS/WFC, ACCUM, WFC	F606W POL0V			Pattern 2, Exps 1-3 in Visit 03 (2)	273 Secs (546 Secs) [==>(Pattern 1)] [==>(Pattern 2)]	[1]
	3	POL0-775	(3) SDSS-J104755.9 2+073951.2	ACS/WFC, ACCUM, WFC	F775W POL0V			Pattern 2, Exps 1-3 in Visit 03 (2)	168 Secs (336 Secs) [==>(Pattern 1)] [==>(Pattern 2)]	[1]
	4	POL60-475	(3) SDSS-J104755.9 2+073951.2	ACS/WFC, ACCUM, WFC	F475W POL60V			Pattern 2, Exps 4-6 in Visit 03 (2)	342 Secs (684 Secs) [==>(Pattern 1)] [==>(Pattern 2)]	[2]
	5	POL60-606	(3) SDSS-J104755.9 2+073951.2	ACS/WFC, ACCUM, WFC	F606W POL60V			Pattern 2, Exps 4-6 in Visit 03 (2)	273 Secs (546 Secs) [==>(Pattern 1)] [==>(Pattern 2)]	[2]
	6	POL60-775	(3) SDSS-J104755.9 2+073951.2	ACS/WFC, ACCUM, WFC	F775W POL60V			Pattern 2, Exps 4-6 in Visit 03 (2)	168 Secs (336 Secs) [==>(Pattern 1)] [==>(Pattern 2)]	[2]
	7	POL120-475	(3) SDSS-J104755.9 2+073951.2	ACS/WFC, ACCUM, WFC	F475W POL120V			Pattern 2, Exps 7-9 in Visit 03 (2)	342 Secs (684 Secs) [==>(Pattern 1)] [==>(Pattern 2)]	[3]
	8	POL120-606	(3) SDSS-J104755.9 2+073951.2	ACS/WFC, ACCUM, WFC	F606W POL120V			Pattern 2, Exps 7-9 in Visit 03 (2)	273 Secs (546 Secs) [==>(Pattern 1)] [==>(Pattern 2)]	[3]
	9	POL120-775	(3) SDSS-J104755.9 2+073951.2	ACS/WFC, ACCUM, WFC	F775W POL120V			Pattern 2, Exps 7-9 in Visit 03 (2)	168 Secs (336 Secs) [==>(Pattern 1)] [==>(Pattern 2)]	[3]



Orbit 2

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