



15277 - Weighing Ultra-Diffuse Galaxies: Bridging the environmental gap

Cycle: 25, 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	(1) UDG-1A	ACS/WFC	2	14-Jul-2017 12:05:30.0	yes
02	(2) UDG-2A	ACS/WFC	2	14-Jul-2017 12:05:31.0	yes
03	(3) UDG-3A	ACS/WFC	2	14-Jul-2017 12:05:32.0	yes
04	(4) UDG-4A	ACS/WFC	2	14-Jul-2017 12:05:33.0	yes
05	(5) UDG-5A	ACS/WFC	2	14-Jul-2017 12:05:34.0	yes
06	(6) UDG-1B	ACS/WFC	2	14-Jul-2017 12:05:34.0	yes
07	(7) UDG-2B	ACS/WFC	2	14-Jul-2017 12:05:35.0	yes
08	(8) UDG-3B	ACS/WFC	2	14-Jul-2017 12:05:36.0	yes
09	(9) UDG-4B	ACS/WFC	2	14-Jul-2017 12:05:37.0	yes
10	(10) UDG-5B	ACS/WFC	2	14-Jul-2017 12:05:38.0	yes

20 Total Orbits Used

ABSTRACT

Interest in ultra-low-surface brightness galaxies has been reignited by the discovery of a substantial population of ultra-diffuse galaxies (UDGs) in dense clusters. These galaxies are characterized by dwarf-like stellar masses spread across giant-galaxy sizes, and their prolonged survival in clusters suggests that they may be extremely dark-matter dominated. The dark matter halos of a handful of UDGs in dense clusters have been "weighed" by the detection of rich globular cluster (GC) systems (~ 20 -100 GCs), and indeed, their inferred mass-to-light ratios ($M/L > 1000$) are unprecedented for their stellar masses. More recently, galaxies with UDG-like properties have been discovered in much lower-density environments. However, the connection between UDGs across the full range of halo environments remains uncertain. Do extreme mass-to-light ratios persist throughout this population regardless of environment? Or, is this a unique characteristic of UDGs in galaxy clusters? Thanks to the depth and wide-area coverage afforded by our ongoing Hyper Suprime-Cam (HSC) Survey, we are carrying out the first truly blind search for UDGs to address this question. We currently have a sample of ~ 300 UDG candidates in environments ranging from the field to intermediate-mass groups. We propose to use ACS/WFC imaging to study the GC systems of 10 UDGs selected for their association with poor groups that span a range in environment a factor of ~ 10 to 100 less dense than Coma. Our program has the potential, for the first time, to establish a connection between the extremely dark-matter dominated UDGs in dense galaxy clusters and those being discovered in much lower-density environments.

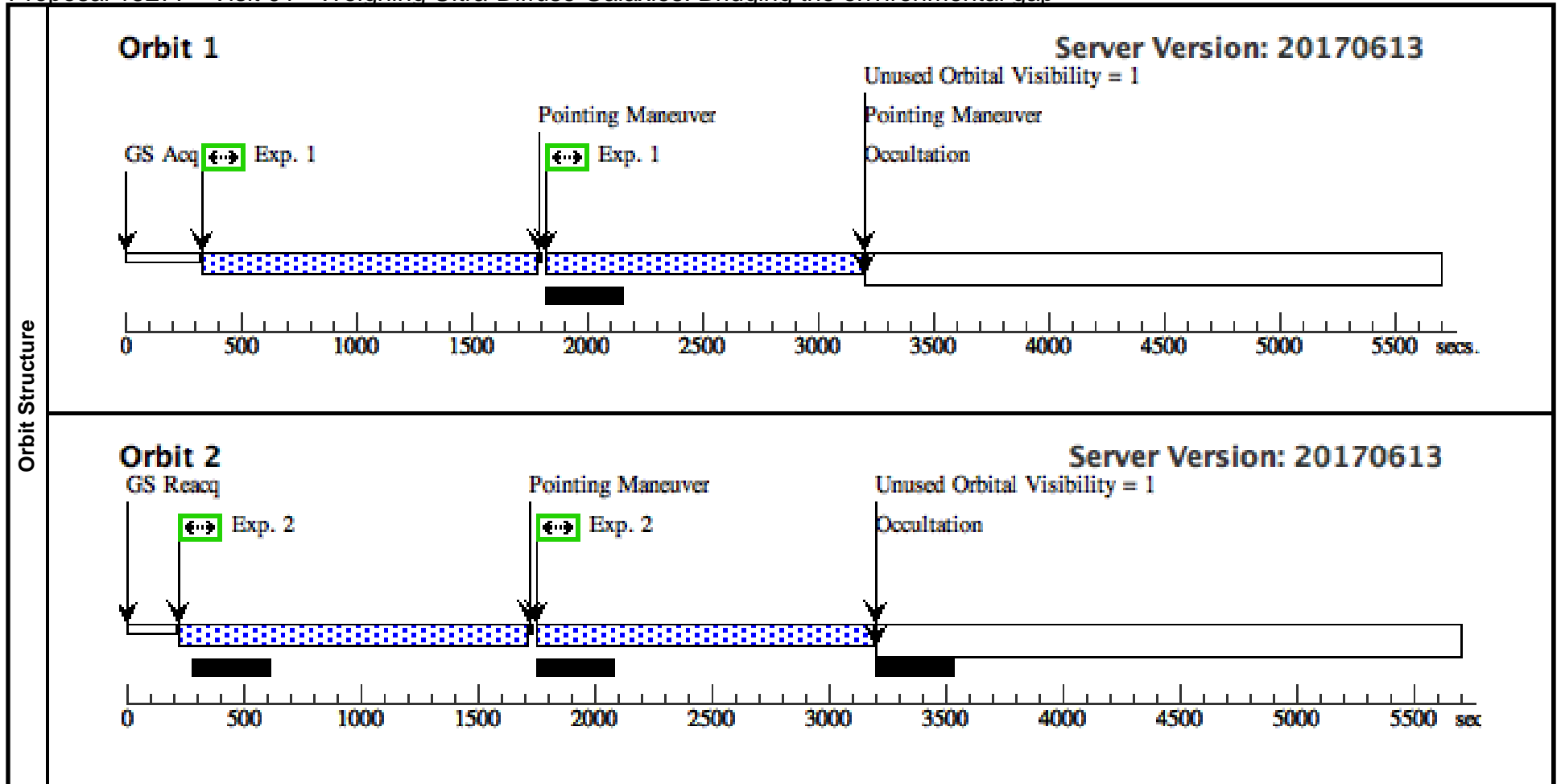
OBSERVING DESCRIPTION

Observing Plan: We will spend the first full orbit on the F814W band, dividing the exposure into two dithers. After guide-star acquisition (6 min), read-out (6.5 min), and one dither (0.5 min), we are left with 40 min of exposure time, assuming a typical 53 min orbit. We will divide that time evenly into two 1200 sec exposures, using the ACS-WFC-DITHER-LINE pattern. In the second orbit, guide star acquisition takes only 4 min, so we have a total of 42 min of exposure on F606W, allowing us to reach comparable depths in the two filters.

Proposal 15277 - Visit 01 - Weighing Ultra-Diffuse Galaxies: Bridging the environmental gap

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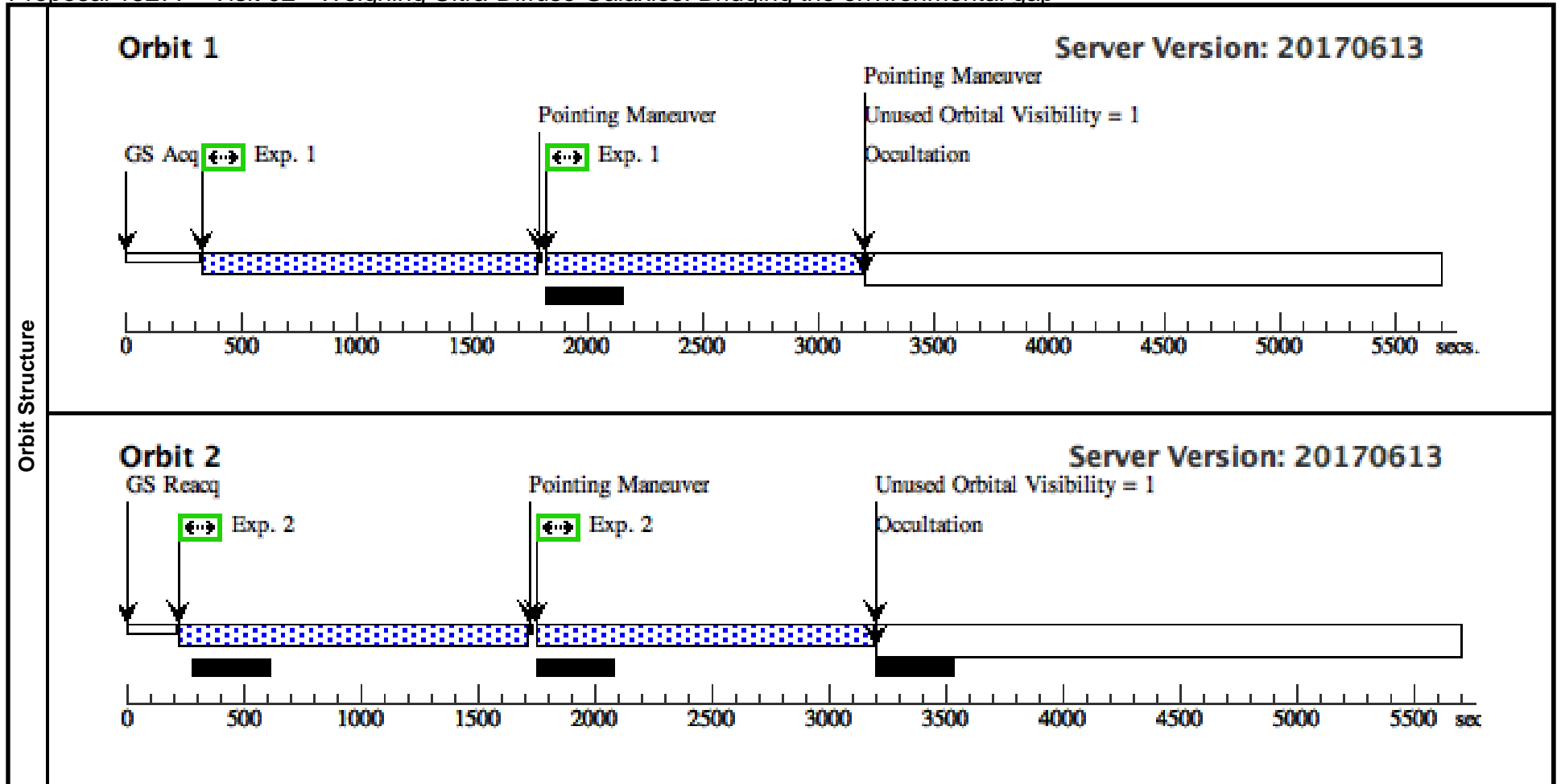
Visit	Proposal 15277, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	UDG-1A	RA: 09 18 45.3141 (139.6888087d) Dec: +00 24 1.41 (.40039d) Equinox: J2000 <i>Comments: Extended=YES</i>		V=19.73+/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) UDG-1A	ACS/WFC, ACCUM, WFC1-FIX	F814W				Pattern 1, Exps 1-1 in Visit 01 (1) 1200 Secs (2486 Secs) <i>[=>1243.0 Secs (Pattern 1)]</i> <i>[=>1243.0 Secs (Pattern 2)]</i>	[1]
2		(1) UDG-1A	ACS/WFC, ACCUM, WFC1-FIX	F606W				Pattern 1, Exps 2-2 in Visit 01 (1) 1200 Secs (2624 Secs) <i>[=>1312.0 Secs (Pattern 1)]</i> <i>[=>1312.0 Secs (Pattern 2)]</i>	[2]	



Proposal 15277 - Visit 02 - Weighing Ultra-Diffuse Galaxies: Bridging the environmental gap

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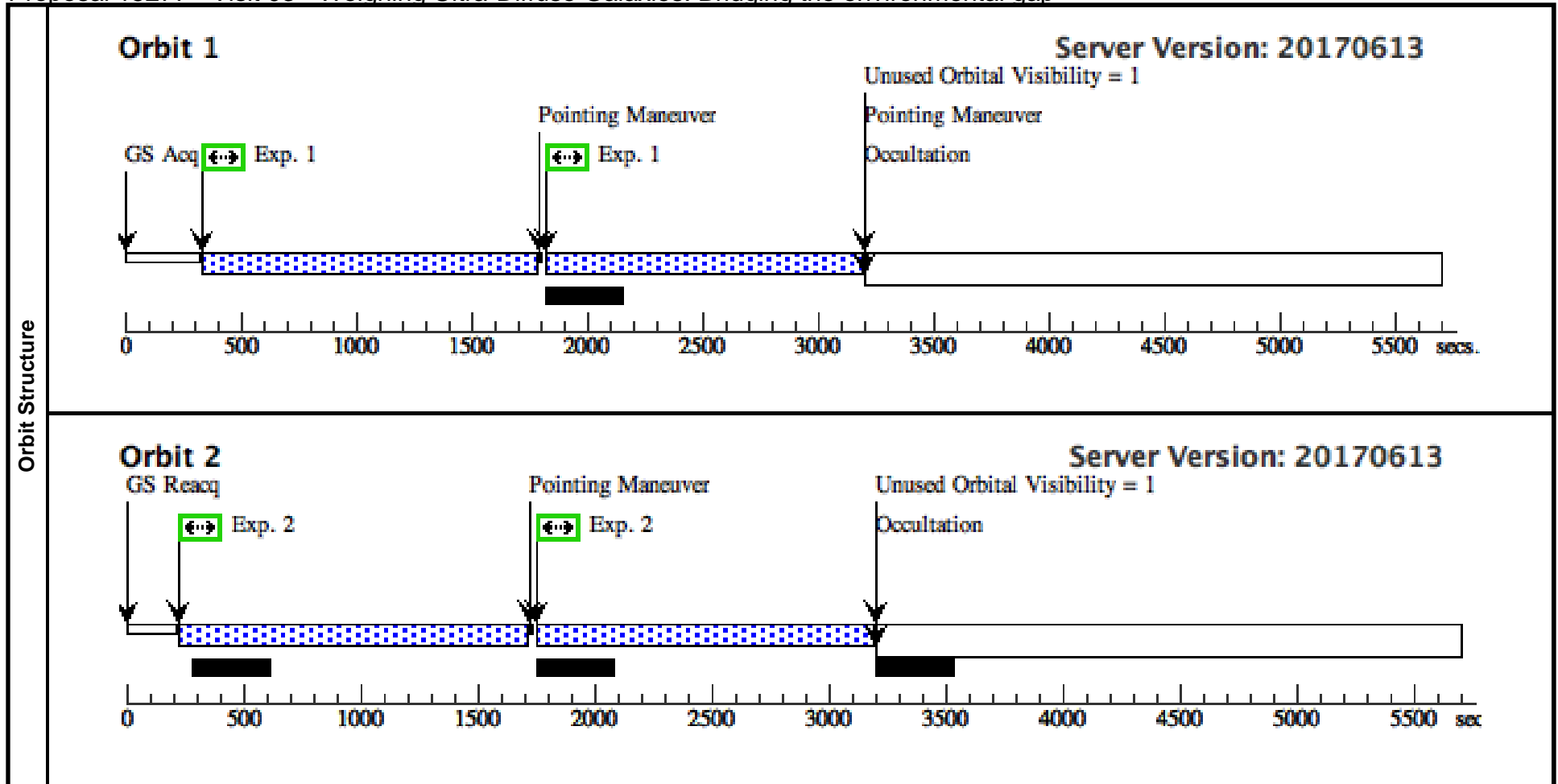
Visit	Proposal 15277, Visit 02 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	UDG-2A	RA: 09 19 45.6059 (139.9400246d) Dec: +00 47 47.81 (.79661d) Equinox: J2000		V=21.05+/-0.1	Reference Frame: ICRS				
	<i>Comments: Extended=YES</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(2) UDG-2A	ACS/WFC, ACCUM, WFC1-FIX	F814W			Pattern 1, Exps 1-1 in Visit 02 (1)	1200 Secs (2486 Secs) [==>1243.0 Secs (Pattern 1)] [==>1243.0 Secs (Pattern 2)]	[1]
	2		(2) UDG-2A	ACS/WFC, ACCUM, WFC1-FIX	F606W			Pattern 1, Exps 2-2 in Visit 02 (1)	1200 Secs (2624 Secs) [==>1312.0 Secs (Pattern 1)] [==>1312.0 Secs (Pattern 2)]	[2]



Proposal 15277 - Visit 03 - Weighing Ultra-Diffuse Galaxies: Bridging the environmental gap

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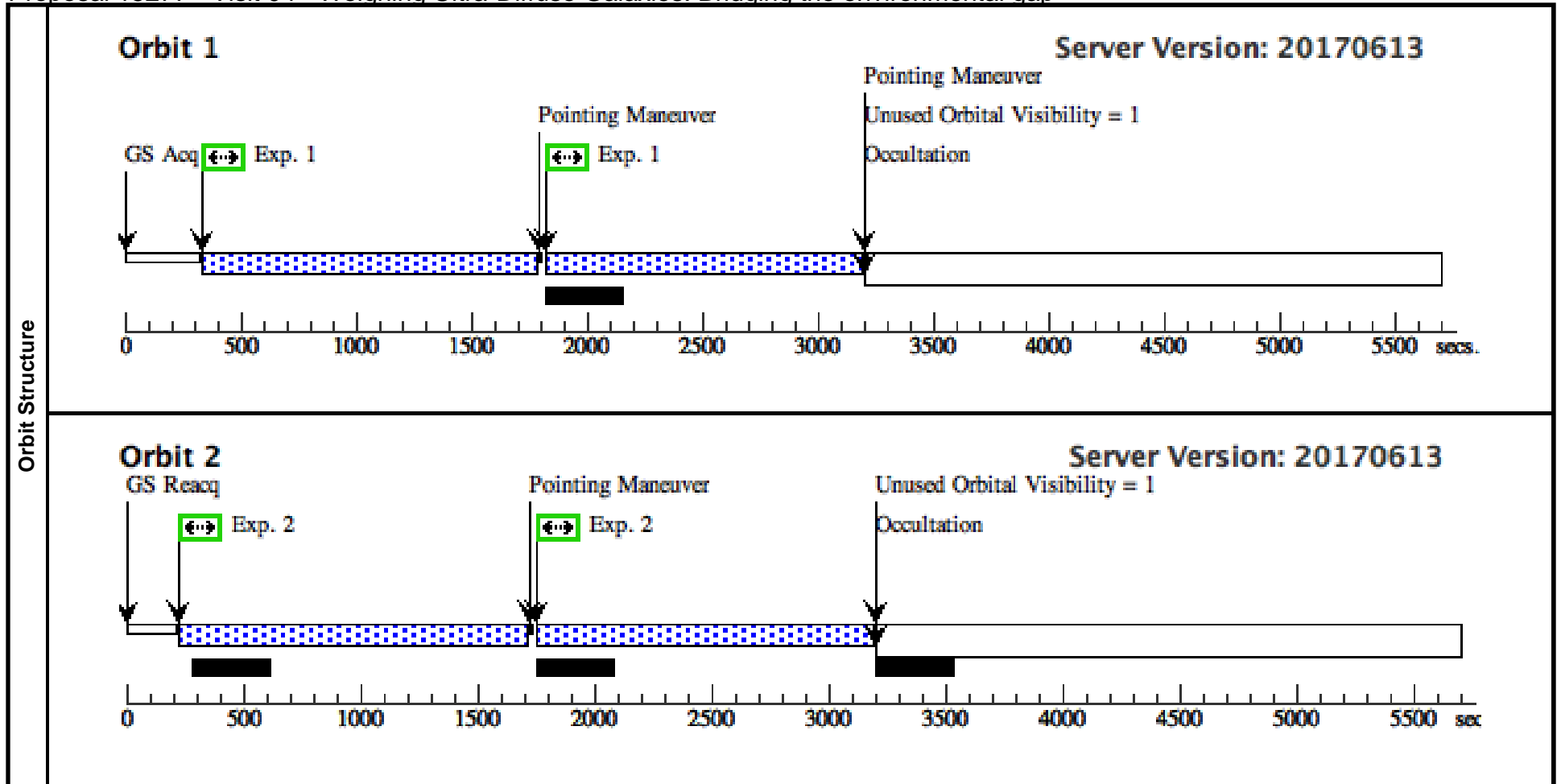
Visit	Proposal 15277, Visit 03 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(3)	UDG-3A	RA: 09 19 55.5500 (139.9814583d) Dec: +01 07 23.88 (1.12330d) Equinox: J2000 <i>Comments: Extended=YES</i>		V=20.21 +/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(3) UDG-3A	ACS/WFC, ACCUM, WFC1-FIX	F814W			Pattern 1, Exps 1-1 in Visit 03 (1)	1200 Secs (2486 Secs) [==>1243.0 Secs (Pattern 1)] [==>1243.0 Secs (Pattern 2)]	[1]
	2		(3) UDG-3A	ACS/WFC, ACCUM, WFC1-FIX	F606W			Pattern 1, Exps 2-2 in Visit 03 (1)	1200 Secs (2624 Secs) [==>1312.0 Secs (Pattern 1)] [==>1312.0 Secs (Pattern 2)]	[2]



Proposal 15277 - Visit 04 - Weighing Ultra-Diffuse Galaxies: Bridging the environmental gap

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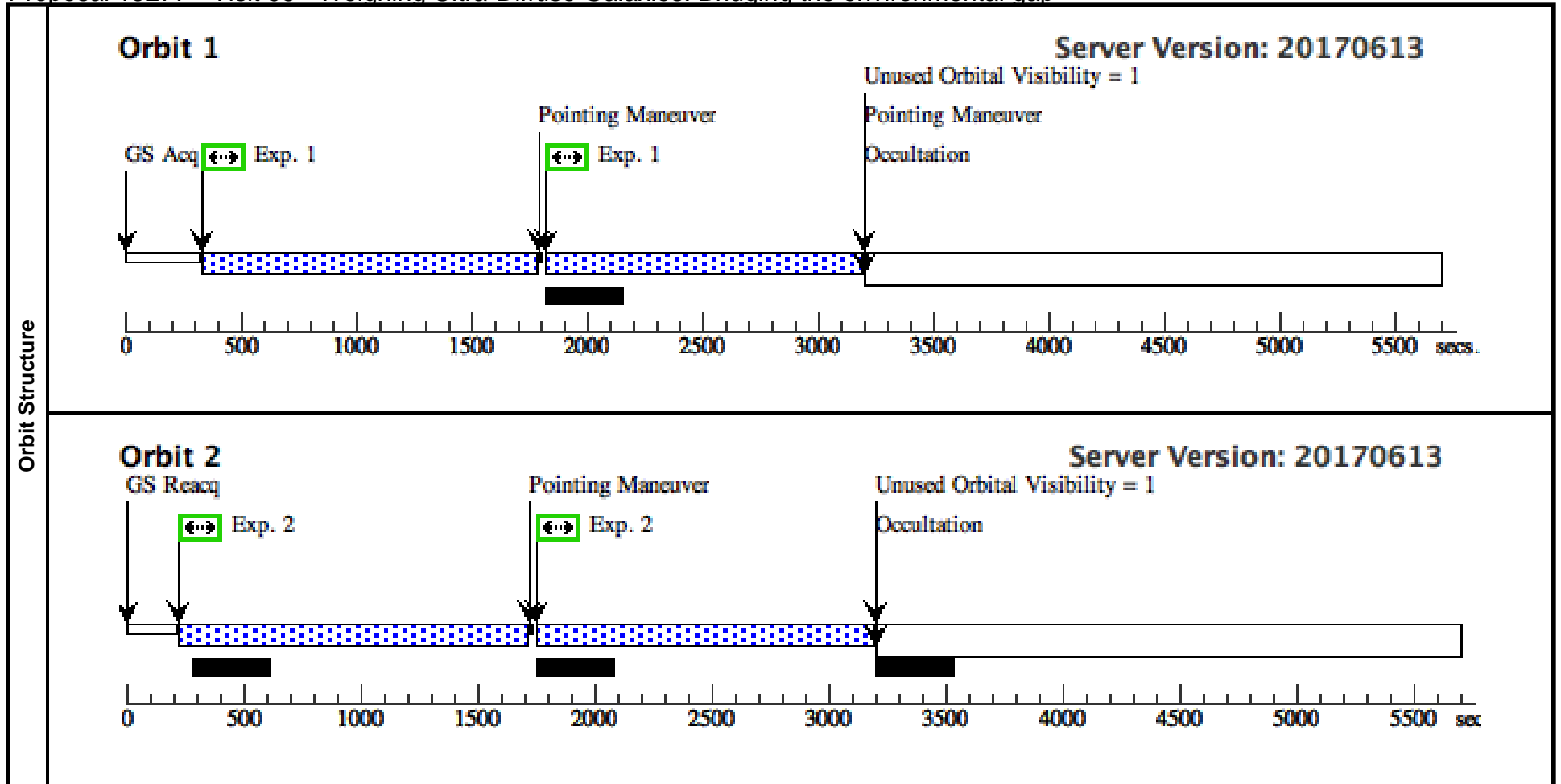
Visit	Proposal 15277, Visit 04 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(4)	UDG-4A	RA: 09 18 55.3503 (139.7306263d) Dec: +01 45 5.57 (1.75155d) Equinox: J2000		V=19.86+/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(4) UDG-4A	ACS/WFC, ACCUM, WFC1-FIX	F814W				Pattern 1, Exps 1-1 i n Visit 04 (1)	1200 Secs (2486 Secs) [==>1243.0 Secs (Pattern 1)] [==>1243.0 Secs (Pattern 2)]
2		(4) UDG-4A	ACS/WFC, ACCUM, WFC1-FIX	F606W				Pattern 1, Exps 2-2 i n Visit 04 (1)	1200 Secs (2624 Secs) [==>1312.0 Secs (Pattern 1)] [==>1312.0 Secs (Pattern 2)]	[2]



Proposal 15277 - Visit 05 - Weighing Ultra-Diffuse Galaxies: Bridging the environmental gap

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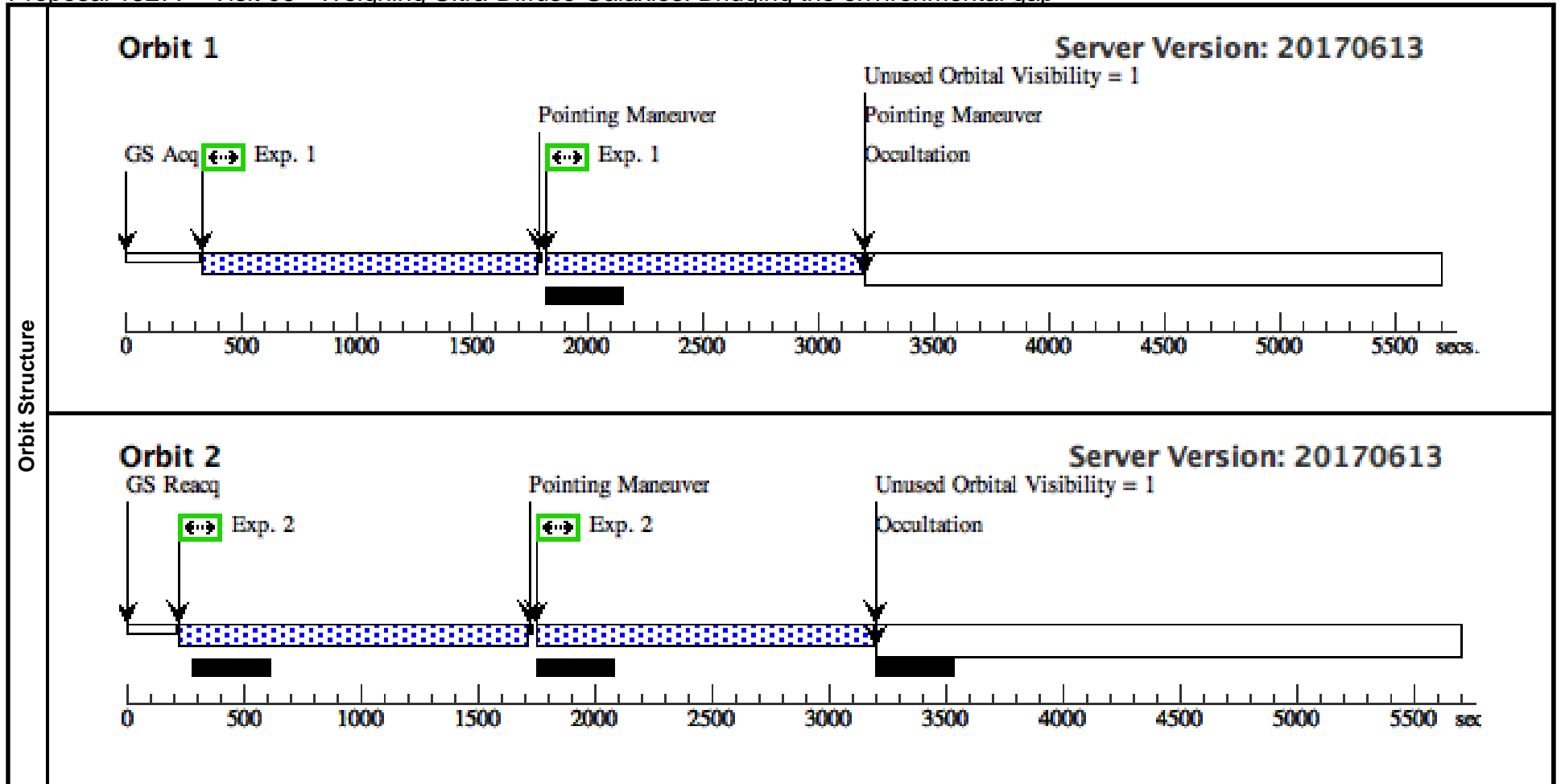
Visit	Proposal 15277, Visit 05 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(5)	UDG-5A	RA: 09 19 59.2126 (139.9967192d) Dec: +00 48 51.29 (.81425d) Equinox: J2000		V=20.03+/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(5) UDG-5A	ACS/WFC, ACCUM, WFC1-FIX	F814W			Pattern 1, Exps 1-1 in Visit 05 (1)	1200 Secs (2486 Secs) [==>1243.0 Secs (Pattern 1)] [==>1243.0 Secs (Pattern 2)]	[1]
	2		(5) UDG-5A	ACS/WFC, ACCUM, WFC1-FIX	F606W			Pattern 1, Exps 2-2 in Visit 05 (1)	1200 Secs (2624 Secs) [==>1312.0 Secs (Pattern 1)] [==>1312.0 Secs (Pattern 2)]	[2]



Proposal 15277 - Visit 06 - Weighing Ultra-Diffuse Galaxies: Bridging the environmental gap

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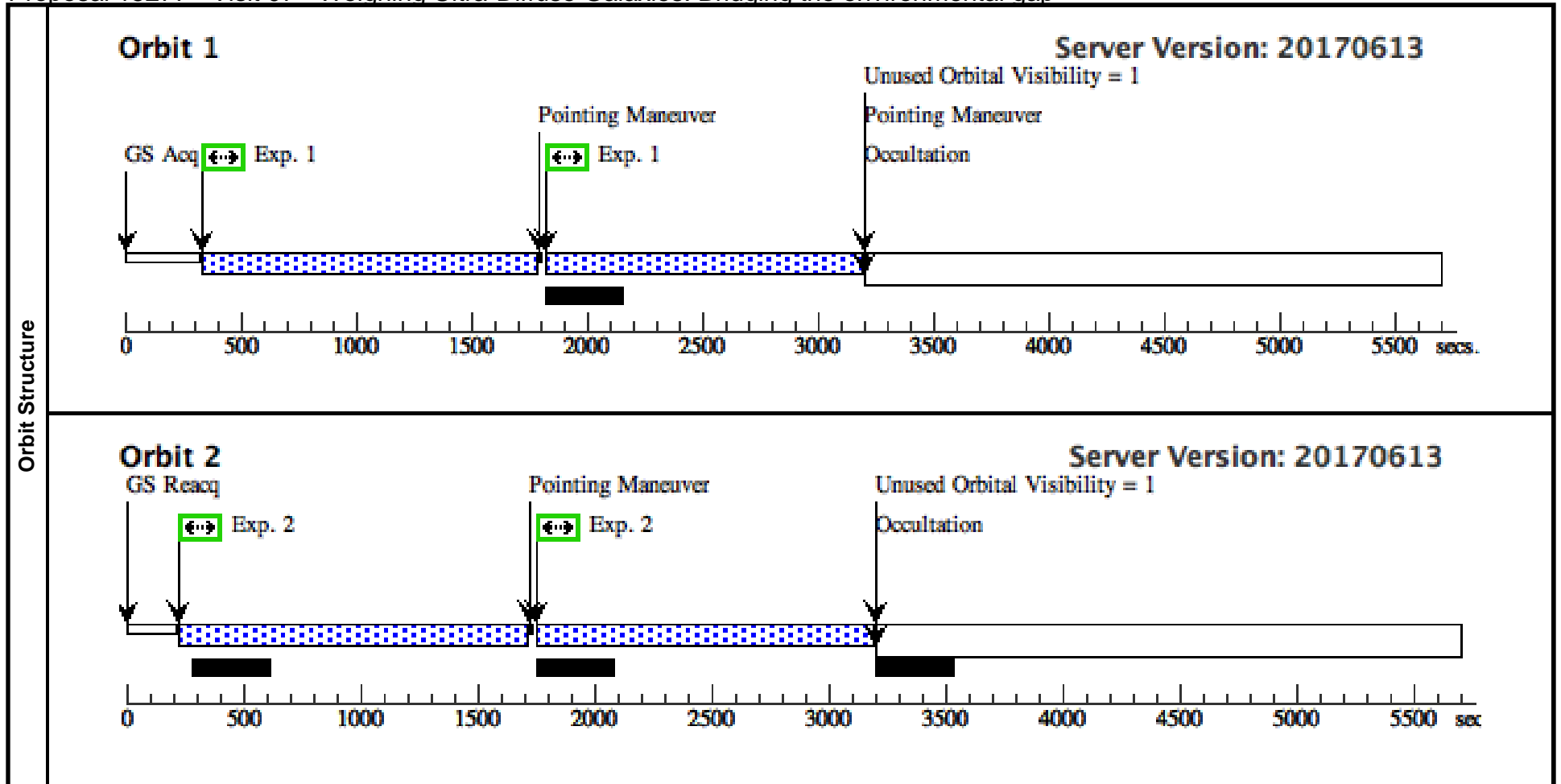
Visit	Proposal 15277, Visit 06 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(6)	UDG-1B	RA: 12 04 46.2387 (181.1926612d) Dec: +01 17 54.43 (1.29845d) Equinox: J2000		V=19.45+/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(6) UDG-1B	ACS/WFC, ACCUM, WFC1-FIX	F814W			Pattern 1, Exps 1-1 in Visit 06 (1)	1200 Secs (2486 Secs) [=>1243.0 Secs (Pattern 1)] [=>1243.0 Secs (Pattern 2)]	[1]
	2		(6) UDG-1B	ACS/WFC, ACCUM, WFC1-FIX	F606W			Pattern 1, Exps 2-2 in Visit 06 (1)	1200 Secs (2624 Secs) [=>1312.0 Secs (Pattern 1)] [=>1312.0 Secs (Pattern 2)]	[2]



Proposal 15277 - Visit 07 - Weighing Ultra-Diffuse Galaxies: Bridging the environmental gap

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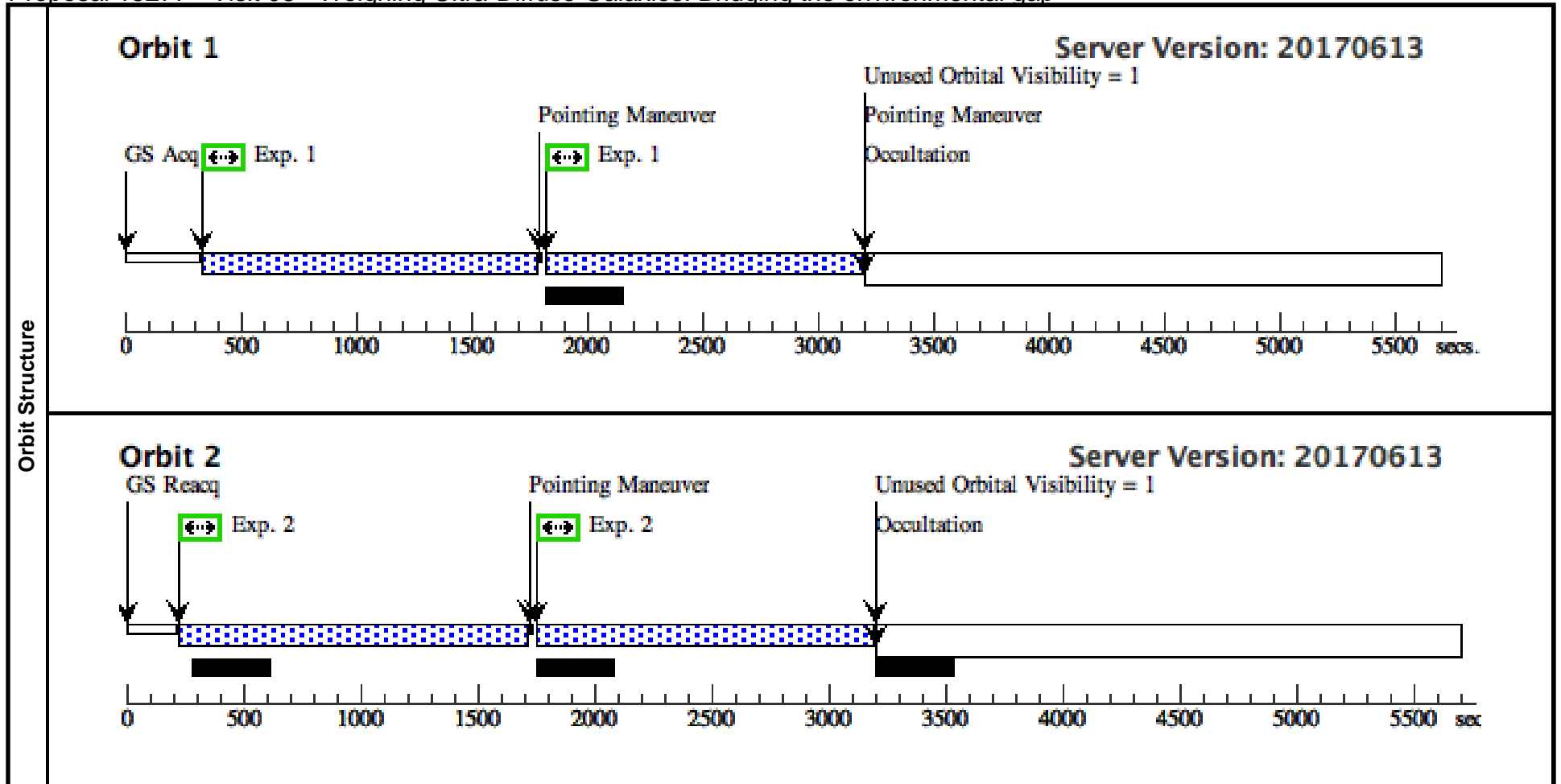
Visit	Proposal 15277, Visit 07 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(7)	UDG-2B	RA: 12 04 7.8421 (181.0326754d) Dec: +01 19 17.47 (1.32152d) Equinox: J2000 <i>Comments: Extended=YES</i>		V=19.89+/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(7) UDG-2B	ACS/WFC, ACCUM, WFC1-FIX	F814W			Pattern 1, Exps 1-1 in Visit 07 (1)	1200 Secs (2486 Secs) [==>1243.0 Secs (Pattern 1)] [==>1243.0 Secs (Pattern 2)]	[1]
	2		(7) UDG-2B	ACS/WFC, ACCUM, WFC1-FIX	F606W			Pattern 1, Exps 2-2 in Visit 07 (1)	1200 Secs (2624 Secs) [==>1312.0 Secs (Pattern 1)] [==>1312.0 Secs (Pattern 2)]	[2]



Proposal 15277 - Visit 08 - Weighing Ultra-Diffuse Galaxies: Bridging the environmental gap

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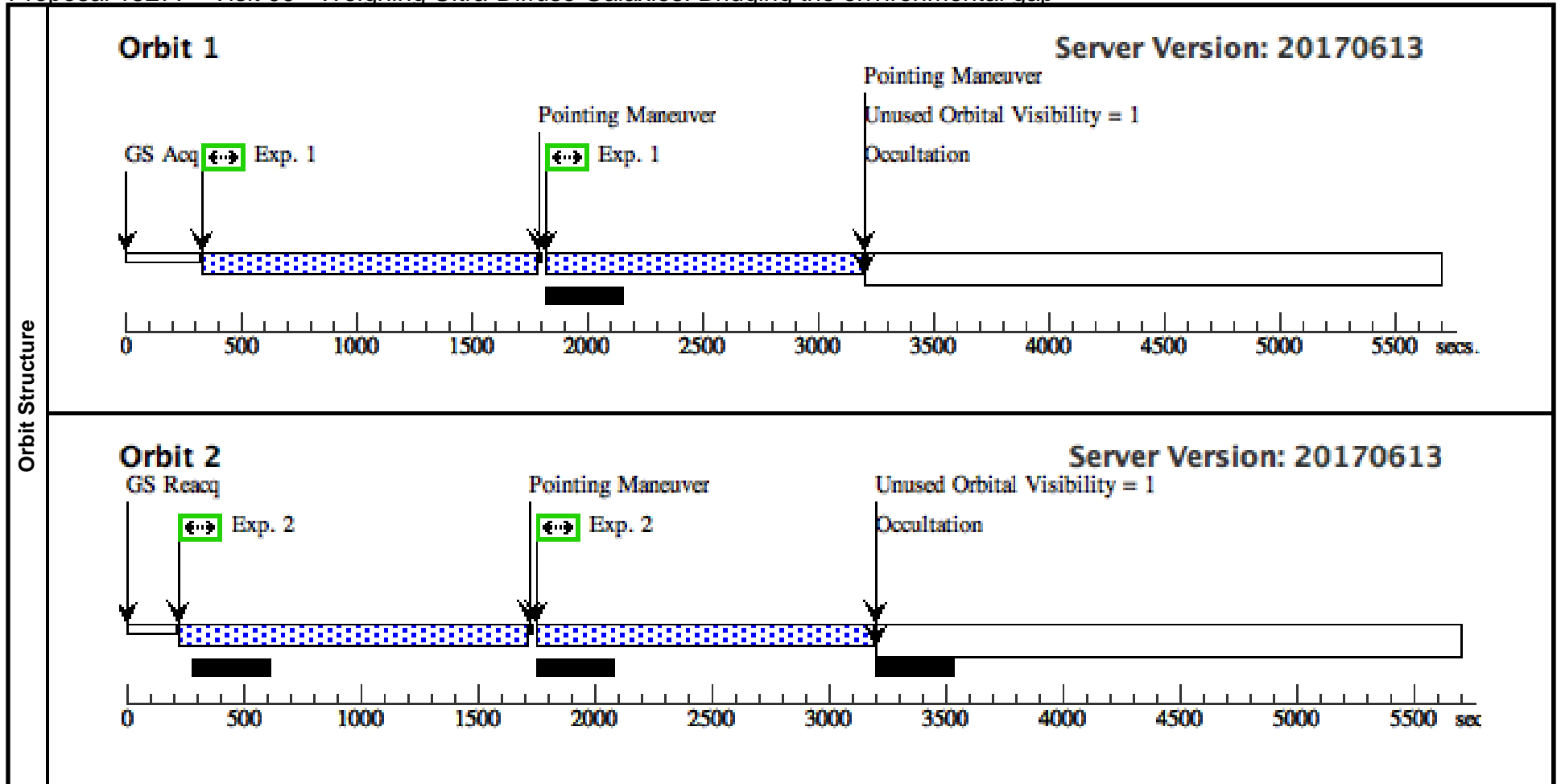
Visit	Proposal 15277, Visit 08 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(8)	UDG-3B	RA: 12 04 33.5750 (181.1398958d) Dec: +01 24 57.40 (1.41594d) Equinox: J2000 <i>Comments: Extended=YES</i>		V=19.88+/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(8) UDG-3B	ACS/WFC, ACCUM, WFC1-FIX	F814W			Pattern 1, Exps 1-1 in Visit 08 (1)	1200 Secs (2486 Secs) [==>1243.0 Secs (Pattern 1)] [==>1243.0 Secs (Pattern 2)]	[1]
	2		(8) UDG-3B	ACS/WFC, ACCUM, WFC1-FIX	F606W			Pattern 1, Exps 2-2 in Visit 08 (1)	1200 Secs (2624 Secs) [==>1312.0 Secs (Pattern 1)] [==>1312.0 Secs (Pattern 2)]	[2]



Proposal 15277 - Visit 09 - Weighing Ultra-Diffuse Galaxies: Bridging the environmental gap

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Visit	Proposal 15277, Visit 09 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(9)	UDG-4B	RA: 12 02 37.0450 (180.6543542d) Dec: +01 30 27.12 (1.50753d) Equinox: J2000 <i>Comments: Extended=YES</i>		V=19.71 +/-0.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(9) UDG-4B	ACS/WFC, ACCUM, WFC1-FIX	F814W				Pattern 1, Exps 1-1 i n Visit 09 (1)	1200 Secs (2486 Secs) [==>1243.0 Secs (Pattern 1)] [==>1243.0 Secs (Pattern 2)]
2		(9) UDG-4B	ACS/WFC, ACCUM, WFC1-FIX	F606W				Pattern 1, Exps 2-2 i n Visit 09 (1)	1200 Secs (2624 Secs) [==>1312.0 Secs (Pattern 1)] [==>1312.0 Secs (Pattern 2)]	[2]



Proposal 15277 - Visit 10 - Weighing Ultra-Diffuse Galaxies: Bridging the environmental gap

Fri Jul 14 16:05:40 GMT 2017

Visit	Proposal 15277, Visit 10 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(1), (2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(10)	UDG-5B	RA: 12 06 30.0051 (181.6250212d) Dec: +01 33 23.19 (1.55644d) Equinox: J2000		V=20.97+/-0.1	Reference Frame: ICRS				
	<i>Comments: Extended=YES</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(10) UDG-5B	ACS/WFC, ACCUM, WFC1-FIX	F814W			Pattern 1, Exps 1-1 in Visit 10 (1)	1200 Secs (2486 Secs) [==>1243.0 Secs (Pattern 1)] [==>1243.0 Secs (Pattern 2)]	[1]
	2		(10) UDG-5B	ACS/WFC, ACCUM, WFC1-FIX	F606W			Pattern 1, Exps 2-2 in Visit 10 (1)	1200 Secs (2624 Secs) [==>1312.0 Secs (Pattern 1)] [==>1312.0 Secs (Pattern 2)]	[2]

