



11225 - The Wavelength Dependence of Accretion Disk Structure

Cycle: 16, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. C. S. Kochanek (PI)	The Ohio State University Research Foundation	ckochanek@astronomy.ohio-state.edu
Dr. Nicholas D. Morgan (CoI)	The Ohio State University Research Foundation	nmorgan@astronomy.ohio-state.edu
Dr. Xinyu Dai (CoI)	The Ohio State University Research Foundation	xinya@astronomy.ohio-state.edu
Dr. Eric Agol (CoI)	University of Washington	agol@astro.washington.edu

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) Q2237+0305	ACS/SBC	1	18-Jan-2008 04:27:29.0	yes
02	(1) Q2237+0305	ACS/SBC	1	18-Jan-2008 04:27:33.0	yes
03	(1) Q2237+0305	ACS/SBC	1	18-Jan-2008 04:27:36.0	yes
04	(1) Q2237+0305	ACS/SBC	1	18-Jan-2008 04:27:38.0	yes
05	(1) Q2237+0305	ACS/SBC	1	18-Jan-2008 04:27:41.0	yes
06	(1) Q2237+0305	ACS/SBC	1	18-Jan-2008 04:27:43.0	yes
07	(1) Q2237+0305	ACS/SBC	1	18-Jan-2008 04:27:46.0	yes
08	(2) RXJ1131-1231	ACS/SBC	1	18-Jan-2008 04:27:48.0	yes
09	(2) RXJ1131-1231	ACS/SBC	1	18-Jan-2008 04:27:50.0	yes

<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>
10	(2) RXJ1131-1231	ACS/SBC	1	18-Jan-2008 04:27:53.0	yes
11	(2) RXJ1131-1231	ACS/SBC	1	18-Jan-2008 04:27:55.0	yes
12	(2) RXJ1131-1231	ACS/SBC	1	18-Jan-2008 04:27:57.0	yes

12 Total Orbits Used

ABSTRACT

We can now routinely measure the size of quasar accretion disks using gravitational microlensing of lensed quasars. The next step to testing accretion disk models is to measure the size of accretion disks as a function of wavelength, particularly at the UV and X-ray wavelengths that should probe the inner, strong gravity regime. Here we focus on two four-image quasar lenses that already have optical (R band) and X-ray size measurements using microlensing. We will combine the HST observations with ground-based monitoring to measure the disk size as a function of wavelength from the near-IR to the UV. We require HST to measure the image flux ratios in the ultraviolet continuum near the Lyman limit of the quasars.

The selected targets have estimated black hole masses that differ by an order of magnitude, and we should find wavelength scalings for the two systems that are very different because the Blue/UV wavelengths should correspond to parts of the disk near the inner edge for the high mass system but not in the low mass system. The results will be modeled using a combination

of simple thin disk models and complete relativistic disk models.

While requiring only 18 orbits, success for one system requires observations in both Cycles 16 and 17.

OBSERVING DESCRIPTION

We will be monitoring two gravitational lenses with the SBC/F165LP. The epochs should be spaced to span the visibility periods with roughly equal time periods

between the observations. The visibility periods are May-September for Q2237 and December-March for RXJ1131. There are a further 6 epochs approved

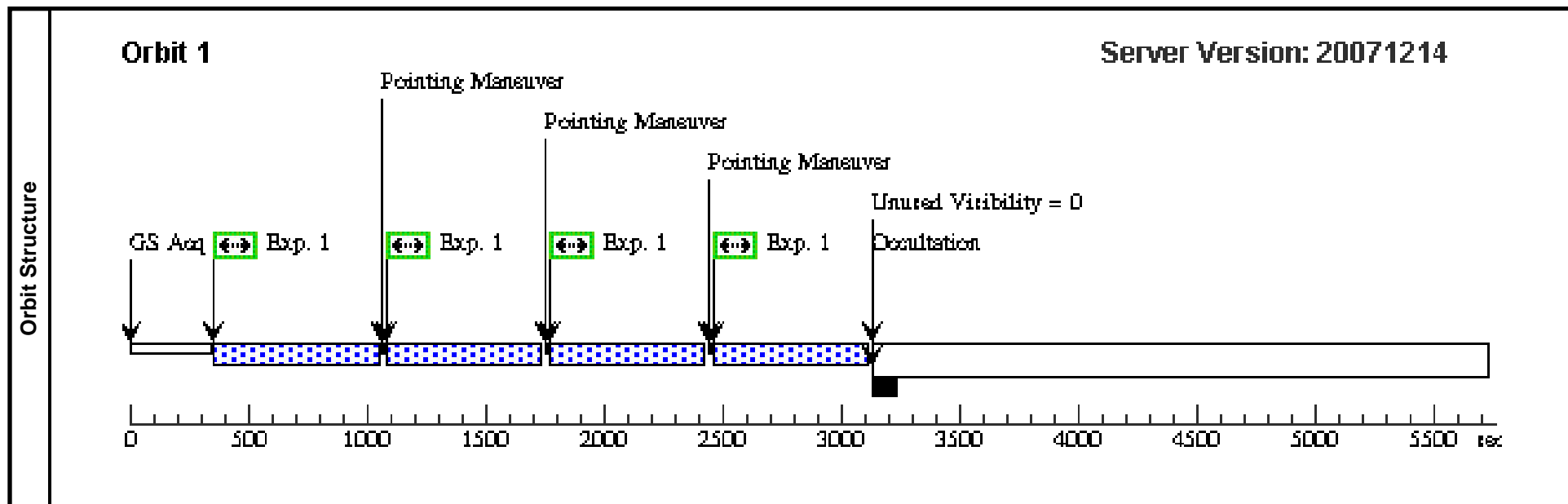
for Q2237 in Cycle 17, but not scheduled here.

The observations themselves are simple single orbit, 4 position dithered SBC/F165LP observations. We have one such image of RXJ1131 already, and the results are as expected.

Proposal 11225 - Visit 01 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:01 GMT 2008

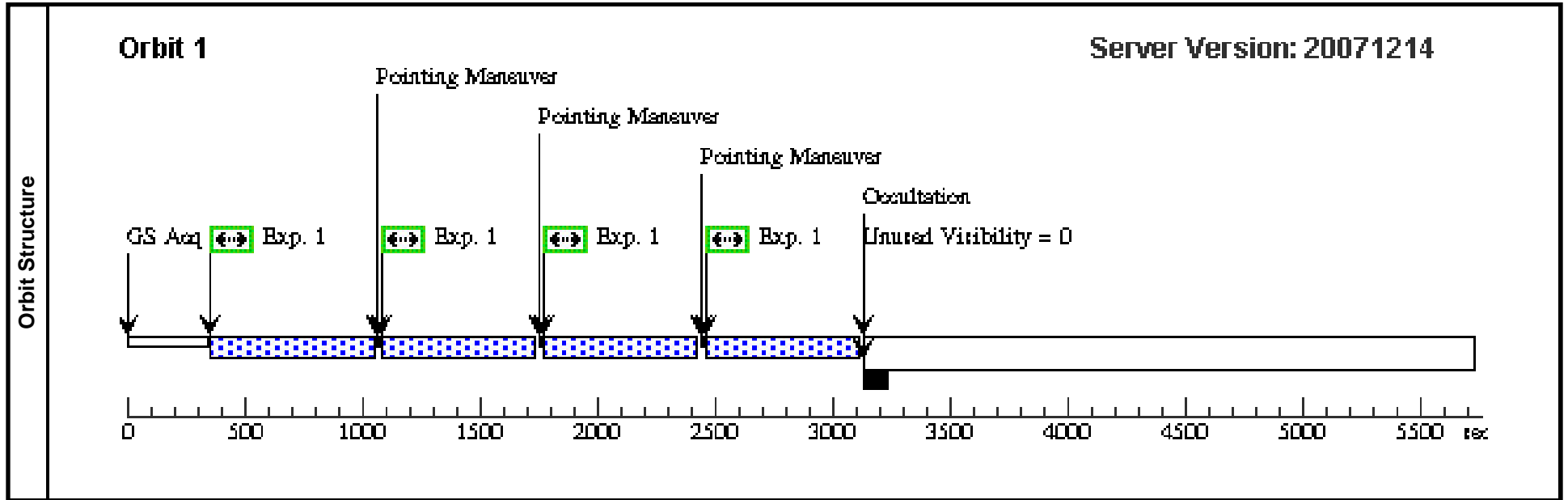
Visit	Proposal 11225, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: BEFORE 01-JUN-2007:00:00:00									
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		(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false					(1)	
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	Q2237+0305	RA: 22 40 30.3400 (340.1264167d) Dec: +03 21 28.80 (3.35800d) Equinox: J2000		V=17	Reference Frame: previous HST observations				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) Q2237+0305	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]	[1]



Proposal 11225 - Visit 02 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:02 GMT 2008

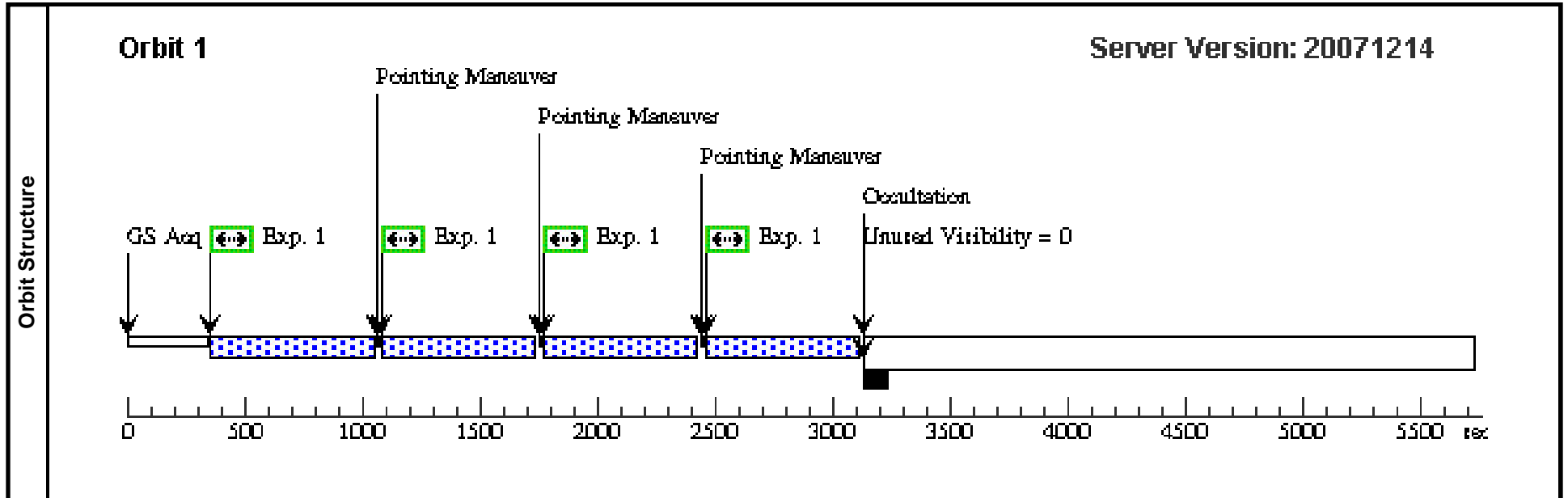
Visit	Proposal 11225, Visit 02 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: AFTER 01 BY 35.0 D TO 45.0 D									
	Patterns	#	Primary Pattern				Secondary Pattern			Exposures
		(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false				(1)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	Q2237+0305	RA: 22 40 30.3400 (340.1264167d) Dec: +03 21 28.80 (3.35800d) Equinox: J2000		V=17	Reference Frame: previous HST observations				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) Q2237+0305	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]	[1]



Proposal 11225 - Visit 03 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:02 GMT 2008

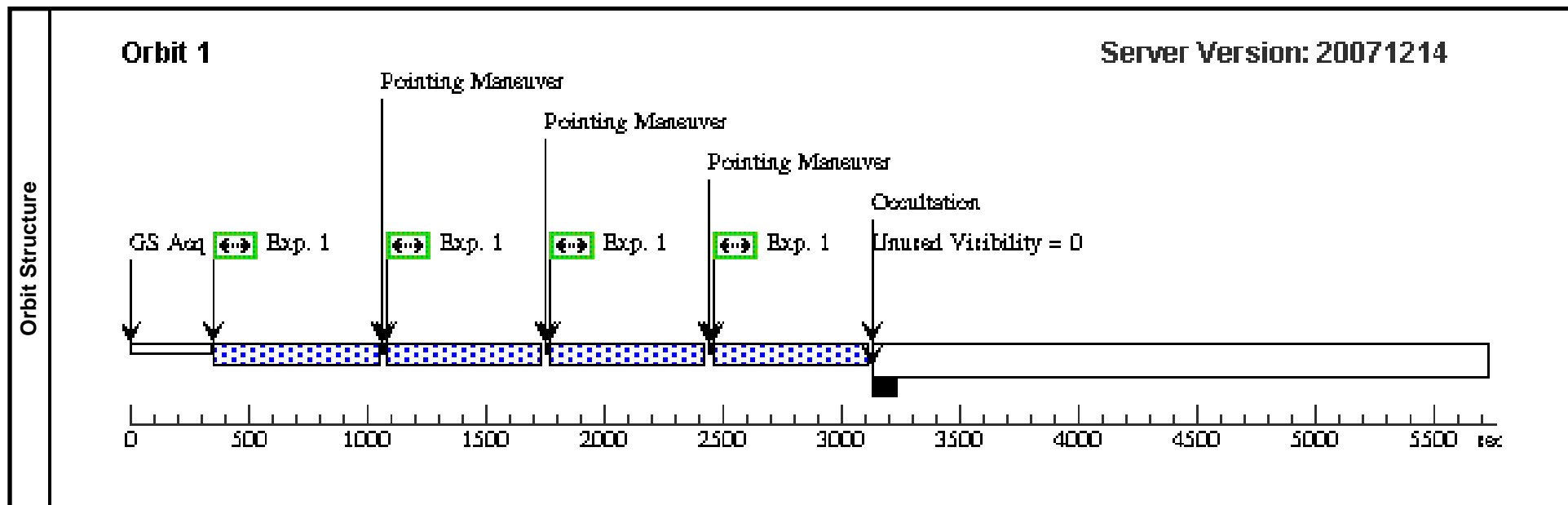
Visit	Proposal 11225, Visit 03 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: AFTER 02 BY 35.0 D TO 45.0 D										
	Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
		(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false				(1)			
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous					
	(1)	Q2237+0305	RA: 22 40 30.3400 (340.1264167d) Dec: +03 21 28.80 (3.35800d) Equinox: J2000		V=17	Reference Frame: previous HST observations					
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1		(1) Q2237+0305	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]	[1]	



Proposal 11225 - Visit 04 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:02 GMT 2008

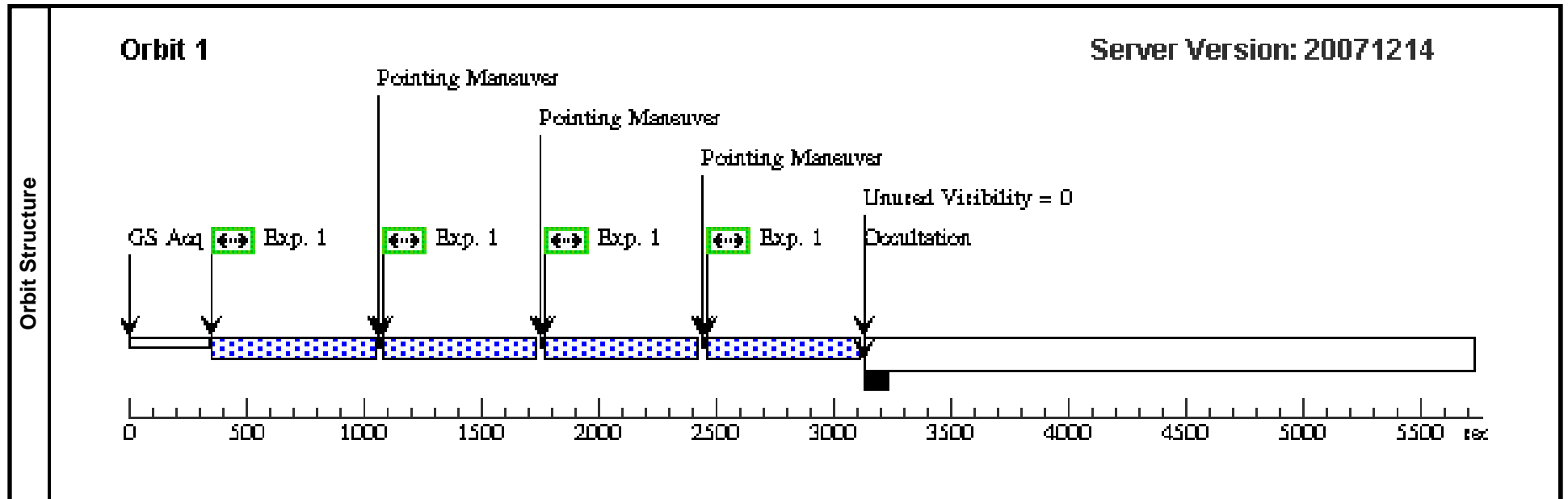
Visit	Proposal 11225, Visit 04 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: AFTER 03 BY 35.0 D TO 45.0 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false						
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	Q2237+0305	RA: 22 40 30.3400 (340.1264167d) Dec: +03 21 28.80 (3.35800d) Equinox: J2000		V=17	Reference Frame: previous HST observations				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) Q2237+0305	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]	[1]



Proposal 11225 - Visit 05 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:03 GMT 2008

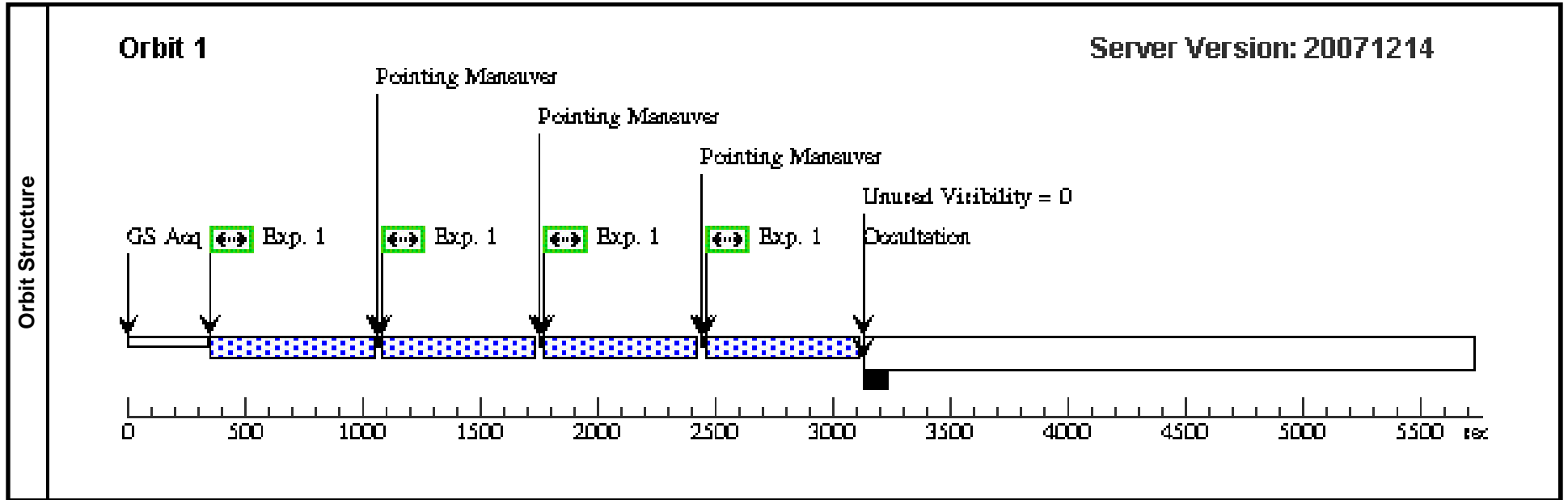
Visit	Proposal 11225, Visit 05 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: BETWEEN 01-MAR-2008:20:18:47 AND 15-MAY-2008:20:18:47									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false						(1)
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	Q2237+0305	RA: 22 40 30.3400 (340.1264167d) Dec: +03 21 28.80 (3.35800d) Equinox: J2000		V=17	Reference Frame: previous HST observations				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) Q2237+0305	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]	[1]



Proposal 11225 - Visit 06 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:03 GMT 2008

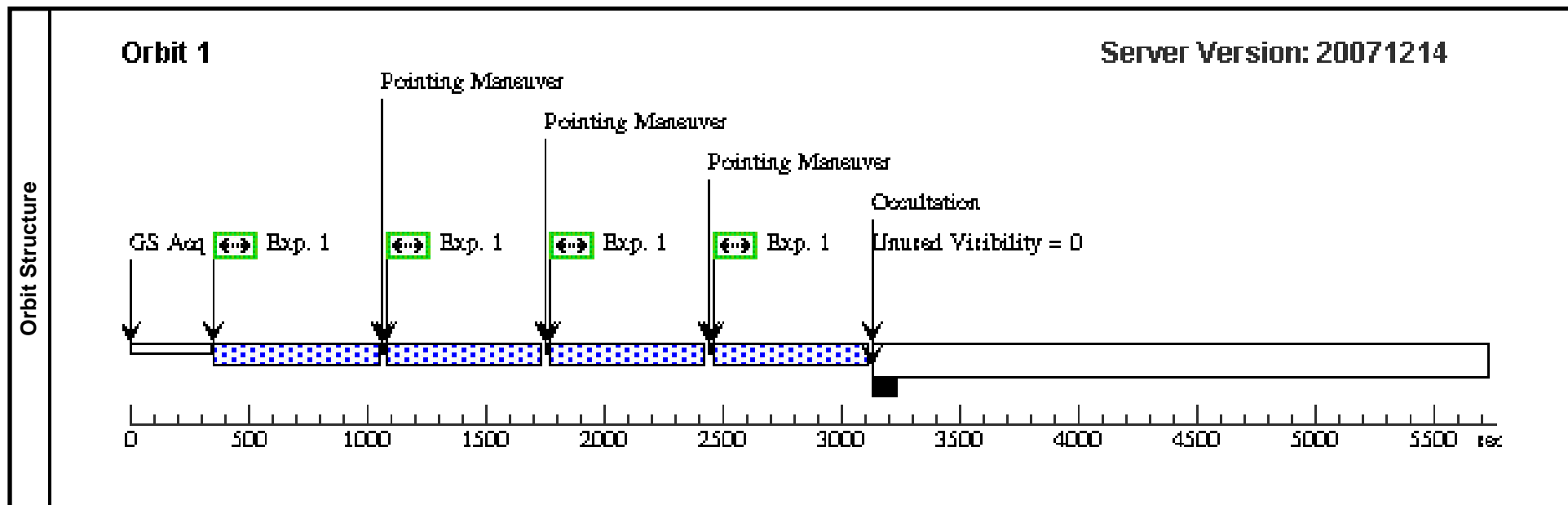
Visit	Proposal 11225, Visit 06 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: AFTER 05 BY 21.0 D TO 26.0 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false						(1)
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	Q2237+0305	RA: 22 40 30.3400 (340.1264167d) Dec: +03 21 28.80 (3.35800d) Equinox: J2000		V=17	Reference Frame: previous HST observations				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) Q2237+0305	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]	[1]



Proposal 11225 - Visit 07 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:04 GMT 2008

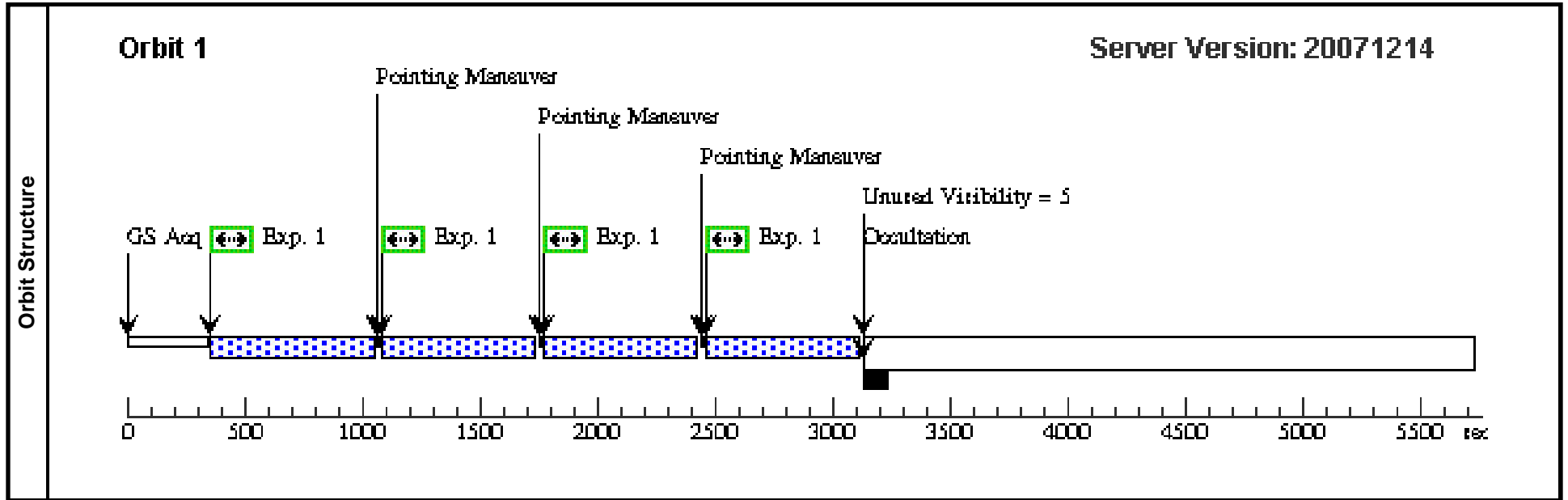
Visit	Proposal 11225, Visit 07 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: AFTER 06 BY 21.0 D TO 26.0 D										
	Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
		(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false				(1)			
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous					
	(1)	Q2237+0305	RA: 22 40 30.3400 (340.1264167d) Dec: +03 21 28.80 (3.35800d) Equinox: J2000		V=17	Reference Frame: previous HST observations					
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1		(1) Q2237+0305	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]	[1]	



Proposal 11225 - Visit 08 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:04 GMT 2008

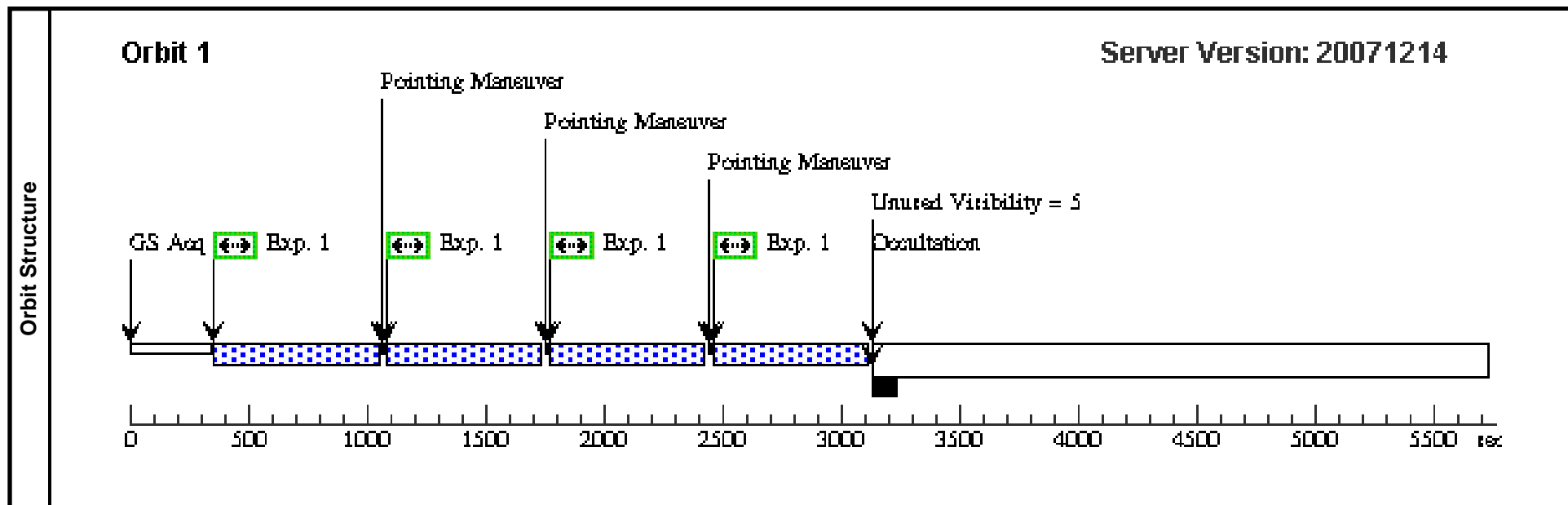
Visit	Proposal 11225, Visit 08 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: BEFORE 01-DEC-2007:00:00:00									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false					(1)	
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	RXJ1131-1231	RA: 11 31 51.6000 (172.9650000d) Dec: -12 31 57.00 (-12.53250d) Equinox: J2000		V=18	Reference Frame: previous HST observations				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(2) RXJ1131-1231	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]	[1]



Proposal 11225 - Visit 09 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:04 GMT 2008

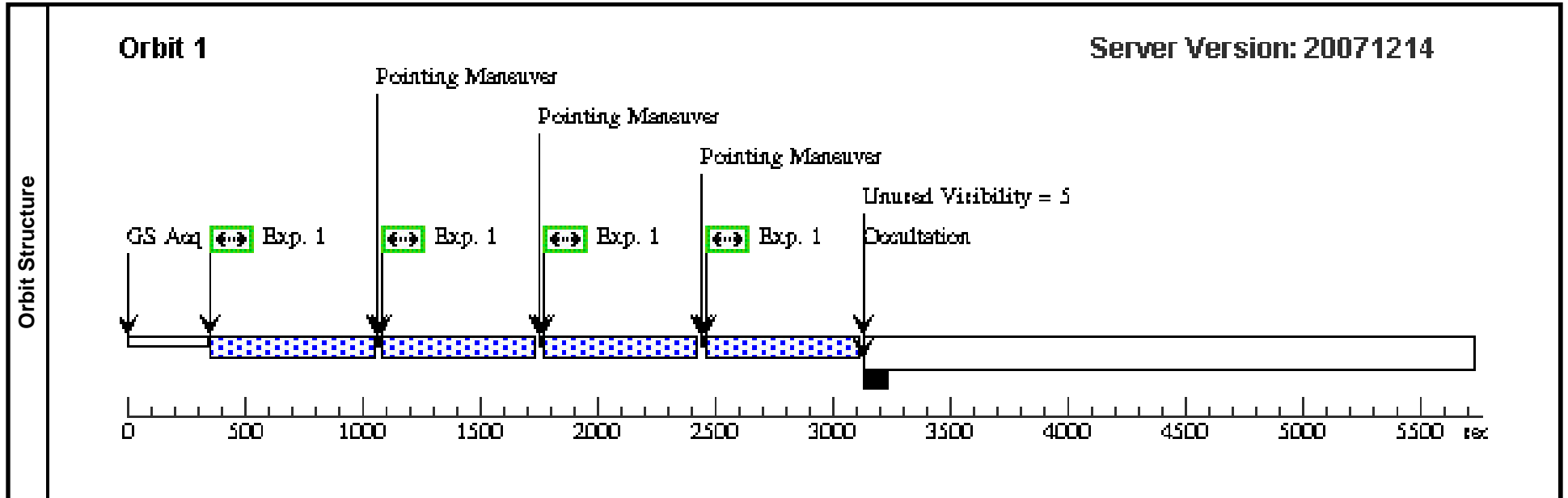
Visit	Proposal 11225, Visit 09 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: AFTER 08 BY 25.0 D TO 35.0 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false					(1)	
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	RXJ1131-1231	RA: 11 31 51.6000 (172.9650000d) Dec: -12 31 57.00 (-12.53250d) Equinox: J2000		V=18	Reference Frame: previous HST observations				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(2) RXJ1131-1231	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]	[1]



Proposal 11225 - Visit 10 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:04 GMT 2008

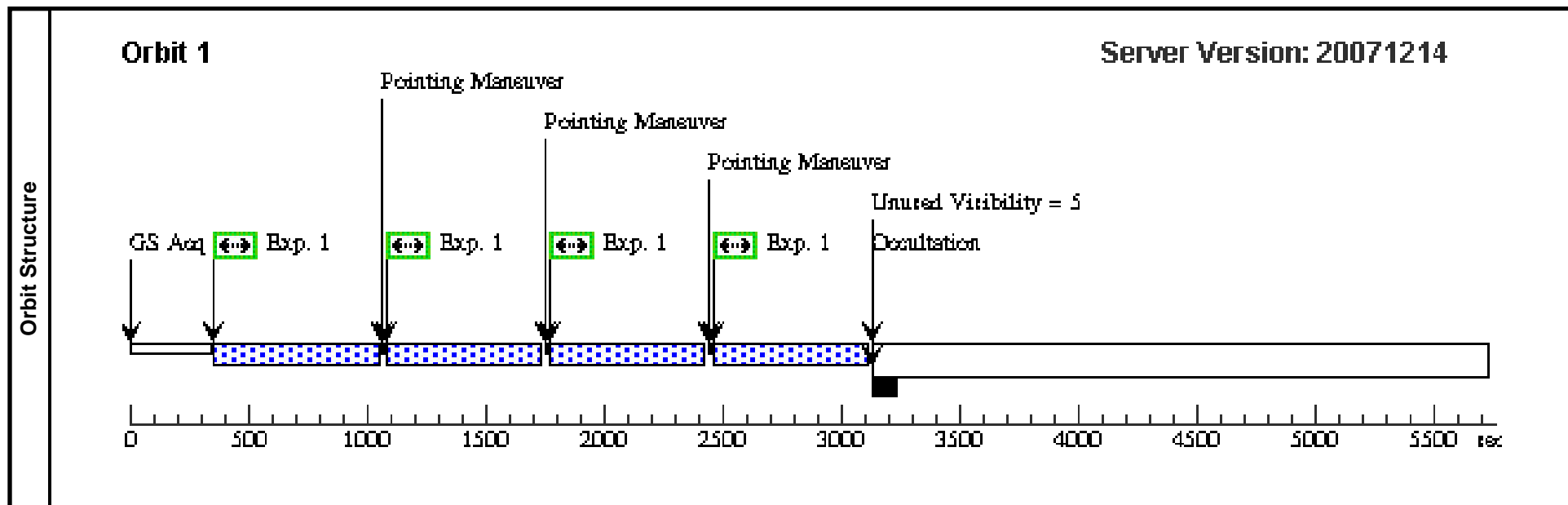
Visit	Proposal 11225, Visit 10 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: AFTER 09 BY 25.0 D TO 35.0 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false					(1)	
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	RXJ1131-1231	RA: 11 31 51.6000 (172.9650000d) Dec: -12 31 57.00 (-12.53250d) Equinox: J2000		V=18	Reference Frame: previous HST observations				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(2) RXJ1131-1231	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]	[1]



Proposal 11225 - Visit 11 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:05 GMT 2008

Visit	Proposal 11225, Visit 11 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: AFTER 10 BY 25.0 D TO 35.0 D										
	Patterns	#	Primary Pattern				Secondary Pattern				Exposures
(1)		Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116		Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false						(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(2)	RXJ1131-1231	RA: 11 31 51.6000 (172.9650000d) Dec: -12 31 57.00 (-12.53250d) Equinox: J2000				V=18		Reference Frame: previous HST observations		
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1		(2) RXJ1131-1231	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]		[1]



Proposal 11225 - Visit 12 - The Wavelength Dependence of Accretion Disk Structure

Fri Jan 18 09:28:05 GMT 2008

Visit	Proposal 11225, Visit 12 Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: AFTER 11 BY 25.0 D TO 35.0 D										
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures		
		(1)	Pattern Type=ACS-SBC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.179 Line Spacing=0.116	Coordinate Frame=POS-TARG Pattern Orientation=20.02 Angle Between Sides=63.65 Center Pattern=false							(1)
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous					
	(2)	RXJ1131-1231	RA: 11 31 51.6000 (172.9650000d) Dec: -12 31 57.00 (-12.53250d) Equinox: J2000		V=18	Reference Frame: previous HST observations					
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1		(2) RXJ1131-1231	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1-1 (1)	600.0 Secs [==>629.0 Secs (Pattern 1)] [==>629.0 Secs (Pattern 2)] [==>629.0 Secs (Pattern 3)] [==>629.0 Secs (Pattern 4)]	[1]	

