



12233 - Strong Gravitational Lensing by Quasars

Cycle: 18, 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) SDSSJ1005+4016	WFC3/UVIS	2	18-Aug-2010 15:37:42.0	yes
02	(2) SDSSJ0013+1523	WFC3/UVIS	2	18-Aug-2010 15:37:45.0	yes
03	(3) SDSSJ0919+2720	WFC3/UVIS	2	18-Aug-2010 15:37:48.0	yes
04	(5) SDSSJ0827+5224	WFC3/UVIS	2	18-Aug-2010 15:37:50.0	yes
05	(4) PSF-STARS-NGC136	WFC3/UVIS	1	18-Aug-2010 15:37:51.0	yes

9 Total Orbits Used

ABSTRACT

The title is correct: we propose to confirm low redshift quasars acting as strong gravitational lenses on background emission line galaxies. Our sample is selected from 22,298 SDSS spectra of quasars with $z < 0.7$. Using cross-correlation techniques, we identify 10-15 quasars that have at least two emission lines in their background, among [OII], H beta and the [OIII] doublet. Four of our quasars have all four lines clearly visible in their background. We propose to confirm the lensing nature of these objects with WFC3/UVIS images in the F475W and F814W filters, and to constrain lens models of the quasar host galaxies. Our sample is similar to the SLACS sample of strong lenses, but with quasar host galaxies as lenses. As these galaxies are massive, we expect that most of the background objects will be strongly lensed (as in SLACS), displaying well visible arcs and multiple images within 1-2 arcsec. We propose to obtain sharp images of our targets along with clean PSF. With image deconvolution techniques, we shall remove the quasar and its host galaxy and we shall measure the size and shape of the background Einstein Ring allowing, for the first time, to weigh directly quasar host galaxies and to measure their total radial mass profile with strong gravitational lensing.

OBSERVING DESCRIPTION

This 9-orbit program proposes to obtain deep WFC3 F475W and F814W images of 4 low redshift QSOs acting as strong gravitational lenses on background emission-line galaxies. The goal is to obtain detailed images of the lensed Einstein rings produced by the 4 QSOs in order to study the mass distribution in the QSO host galaxies.

For each object, we use one orbit per filter (2 orbits per visit), and use 6 exposures per orbit. The dither pattern is a line with 6 exposures with the first exposure centered on the center of UVIS1.

One full orbit is used to measure the PSF of the HST in the two filters in the same observing conditions as the QSOs. The PSF will be used for deconvolution purposes. The field chosen is the open cluster NGC 136. The orbit is divided in 8 exposures: 1x60s + 3x350s in F475W followed by 1x60s + 3x350s in F814W

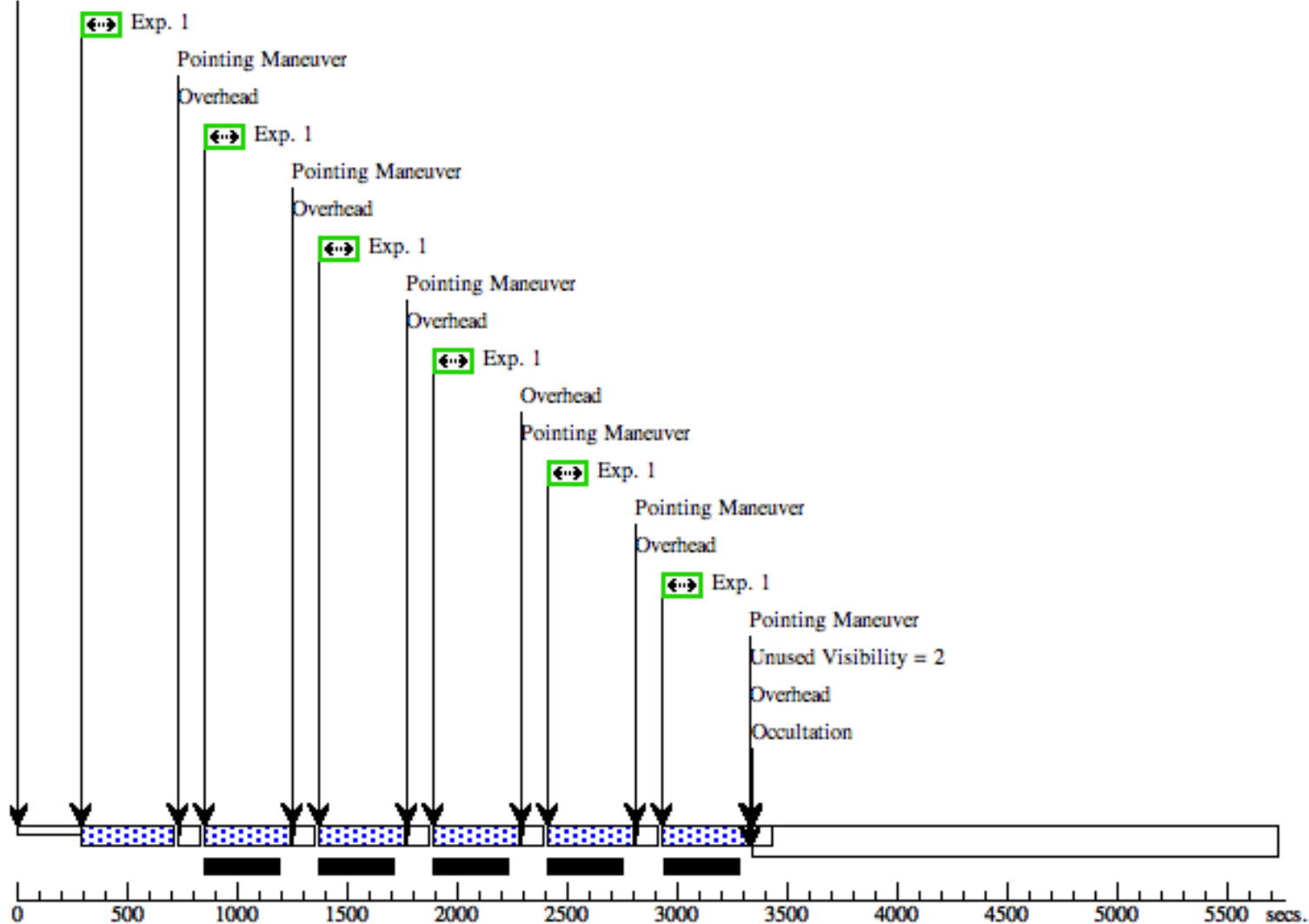
Proposal 12233 (STScI Edit Number: 0, Created: Wednesday, August 18, 2010 3:37:52 PM EDT) - Overview

Visit	Proposal 12233, Visit 01 Wed Aug 18 19:37:52 GMT 2010									
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none)									
Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=6 Point Spacing=0.145 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false							(1), (2)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous	
	(1)	SDSSJ1005+4016	RA: 10 05 22.0600 (151.3419167d) Dec: +40 16 10.13 (40.26948d) Equinox: J2000				V=17.2		Reference Frame: ICRS	
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F475W	(1) SDSSJ1005+4016	WFC3/UVIS, ACCUM, UVIS1	F475W			Pattern 1, Exps 1-1 (1)	390 Secs	
									[==>393.0 Secs (Pattern 1)] [==>393.0 Secs (Pattern 2)] [==>393.0 Secs (Pattern 3)] [==>393.0 Secs (Pattern 4)] [==>393.0 Secs (Pattern 5)] [==>393.0 Secs (Pattern 6)]	[1]
	2	F814W	(1) SDSSJ1005+4016	WFC3/UVIS, ACCUM, UVIS1	F814W			Pattern 1, Exps 2-2 (1)	390 Secs	
									[==>411.0 Secs (Pattern 1)] [==>411.0 Secs (Pattern 2)] [==>411.0 Secs (Pattern 3)] [==>411.0 Secs (Pattern 4)] [==>411.0 Secs (Pattern 5)] [==>411.0 Secs (Pattern 6)]	[2]

Orbit 1

Server Version: 20100505

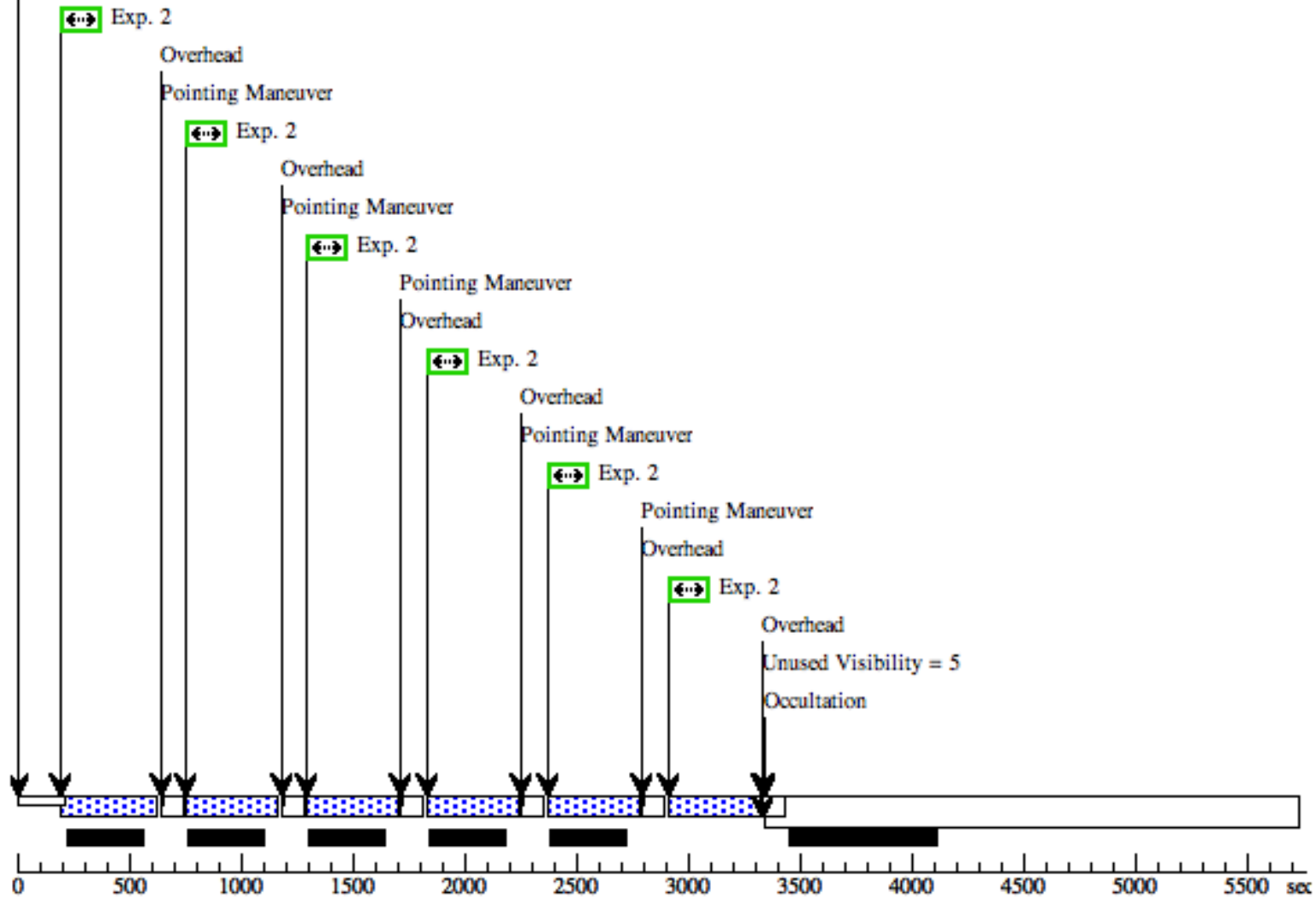
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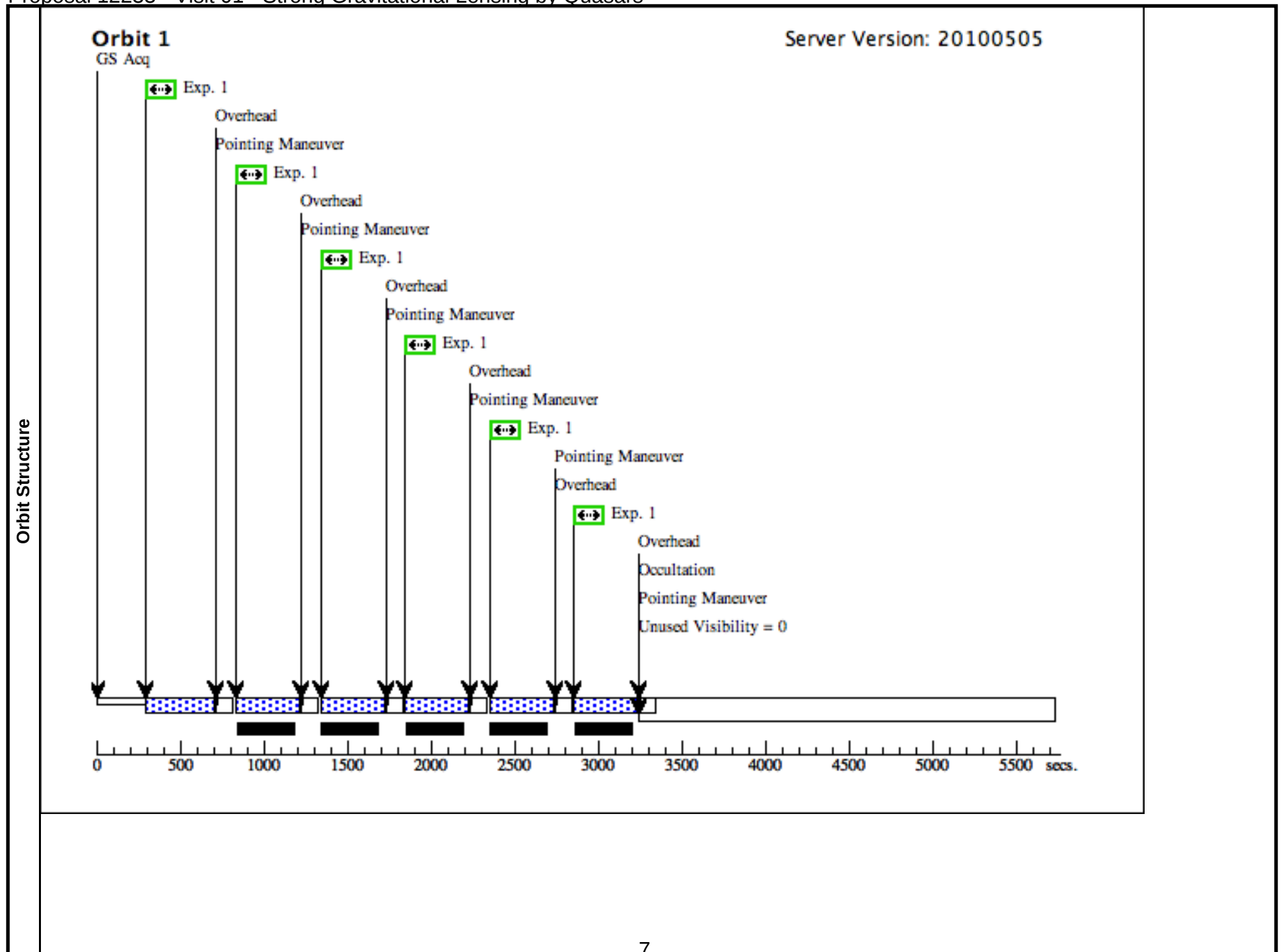
Orbit 2

GS Reacq



Proposal 12233 - Visit 01 - Strong Gravitational Lensing by Quasars

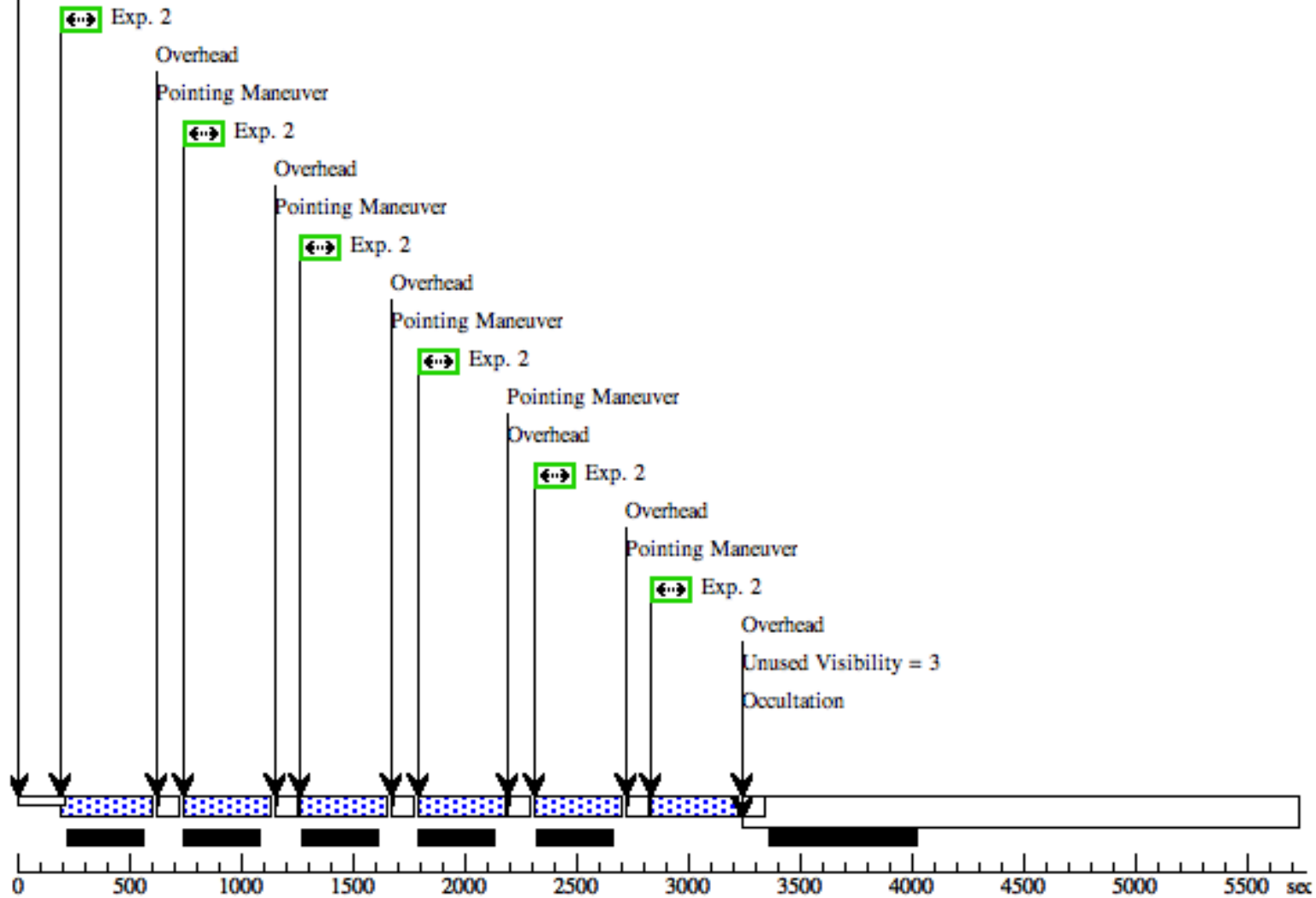
Visit	Proposal 12233, Visit 02 Wed Aug 18 19:37:53 GMT 2010									
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none)									
Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=6 Point Spacing=0.145 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false							(1), (2)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous	
	(2)	SDSSJ0013+1523	RA: 00 13 40.2100 (3.4175417d) Dec: +15 23 12.05 (15.38668d) Equinox: J2000				V=18.0		Reference Frame: ICRS	
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F475W	(2) SDSSJ0013+1523 3	WFC3/UVIS, ACCUM, UVIS1	F475W			Pattern 1, Exps 1-1 (1)	375 Secs	
									[==>378.0 Secs (Pattern 1)] [==>378.0 Secs (Pattern 2)] [==>378.0 Secs (Pattern 3)] [==>378.0 Secs (Pattern 4)] [==>378.0 Secs (Pattern 5)] [==>378.0 Secs (Pattern 6)]	[1]
	2	F814W	(2) SDSSJ0013+1523 3	WFC3/UVIS, ACCUM, UVIS1	F814W			Pattern 1, Exps 2-2 (1)	375 Secs	
									[==>396.0 Secs (Pattern 1)] [==>396.0 Secs (Pattern 2)] [==>396.0 Secs (Pattern 3)] [==>396.0 Secs (Pattern 4)] [==>396.0 Secs (Pattern 5)] [==>396.0 Secs (Pattern 6)]	[2]



Server Version: 20100505

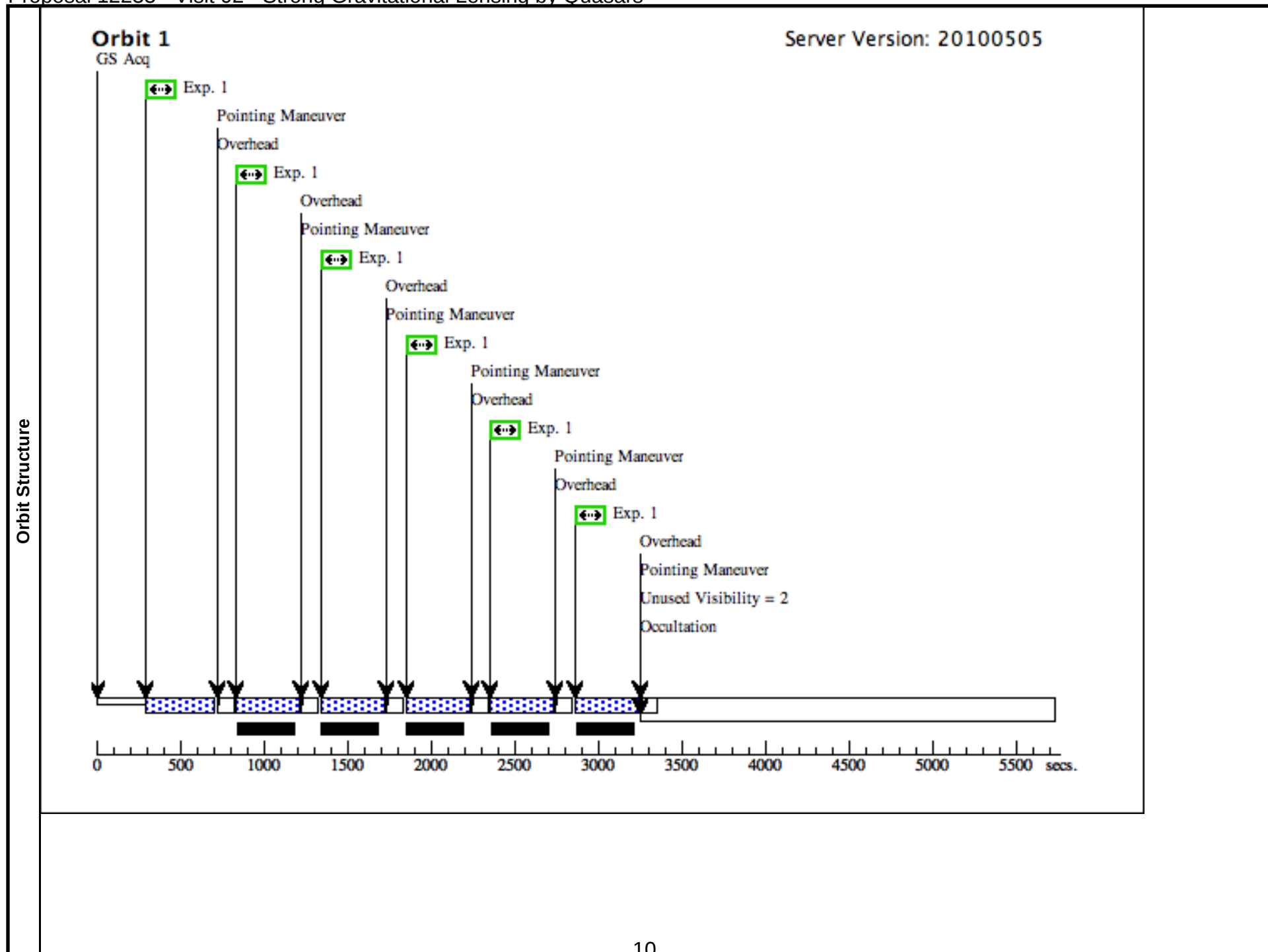
Orbit 2

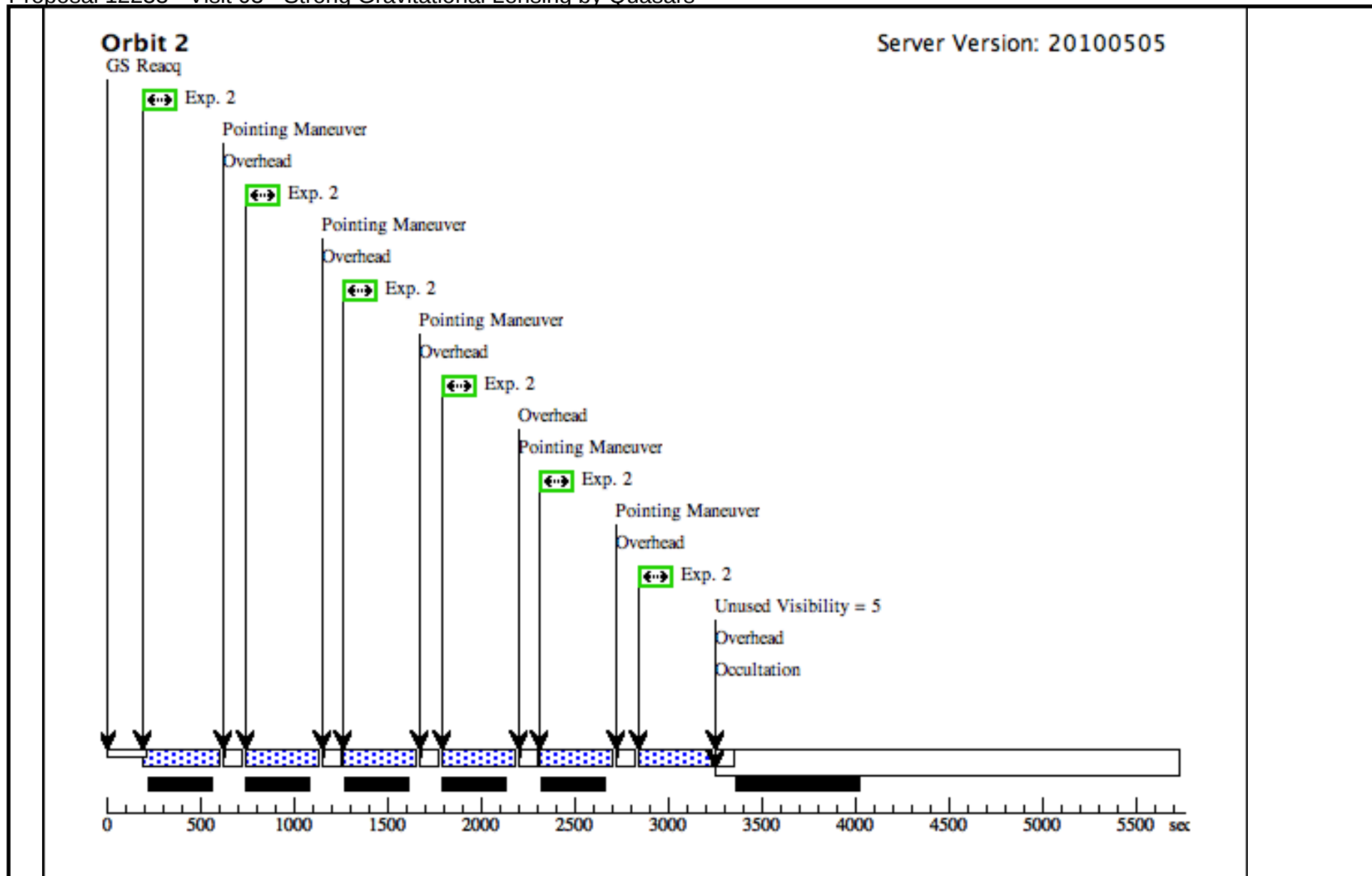
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Proposal 12233 - Visit 02 - Strong Gravitational Lensing by Quasars

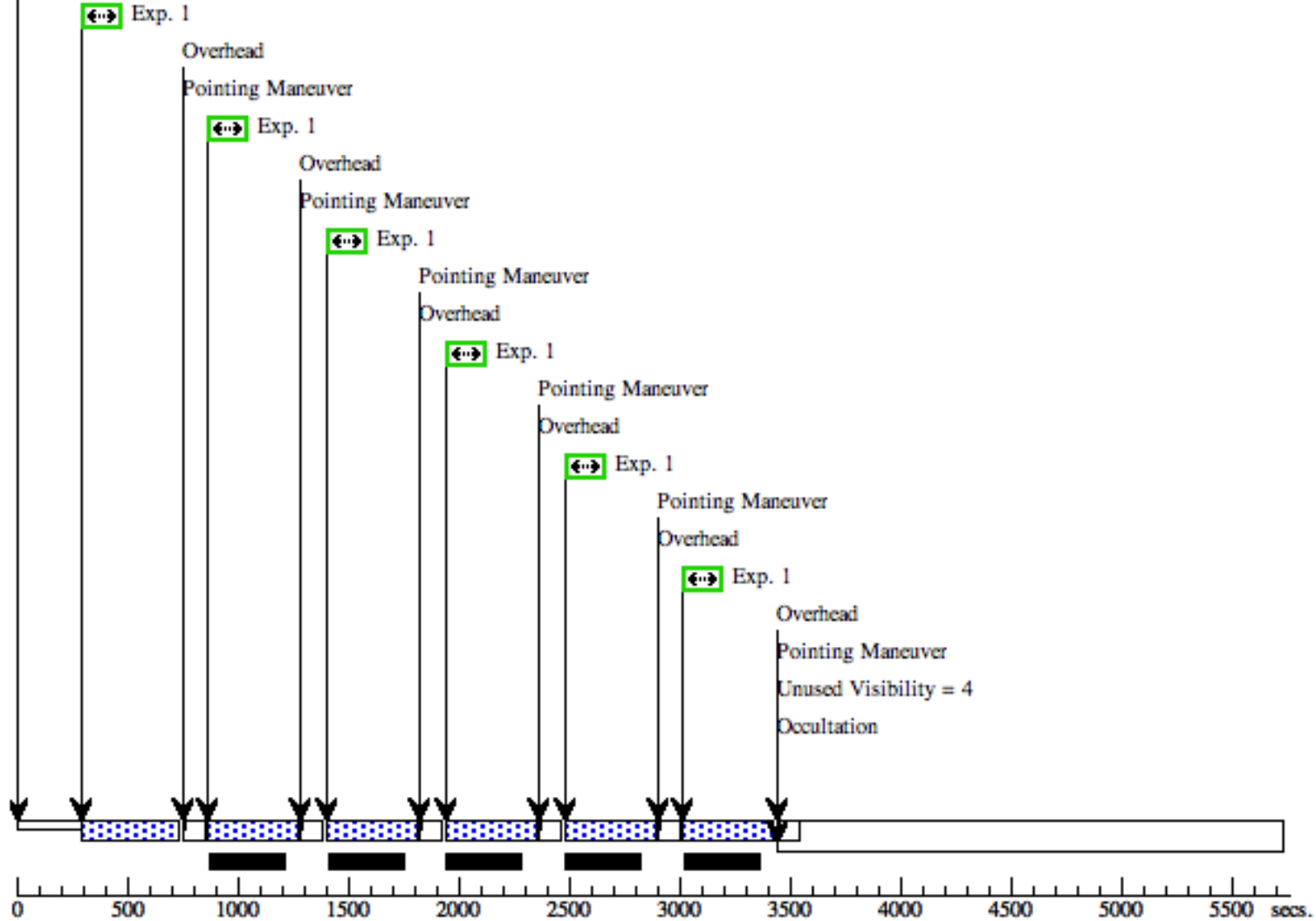
Visit	Proposal 12233, Visit 03 Wed Aug 18 19:37:53 GMT 2010									
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none)									
Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=6 Point Spacing=0.145 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false							(1), (2)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous	
	(3)	SDSSJ0919+2720	RA: 09 19 26.2200 (139.8592500d) Dec: +27 20 50.97 (27.34749d) Equinox: J2000				V=18.0		Reference Frame: ICRS	
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F475W	(3) SDSSJ0919+2720 0	WFC3/UVIS, ACCUM, UVIS1	F475W			Pattern 1, Exps 1-1 (1)	375 Secs	
									[==>379.0 Secs (Pattern 1)] [==>379.0 Secs (Pattern 2)] [==>379.0 Secs (Pattern 3)] [==>379.0 Secs (Pattern 4)] [==>379.0 Secs (Pattern 5)] [==>379.0 Secs (Pattern 6)]	[1]
	2	F814W	(3) SDSSJ0919+2720 0	WFC3/UVIS, ACCUM, UVIS1	F814W			Pattern 1, Exps 2-2 (1)	375 Secs	
									[==>397.0 Secs (Pattern 1)] [==>397.0 Secs (Pattern 2)] [==>397.0 Secs (Pattern 3)] [==>397.0 Secs (Pattern 4)] [==>397.0 Secs (Pattern 5)] [==>397.0 Secs (Pattern 6)]	[2]

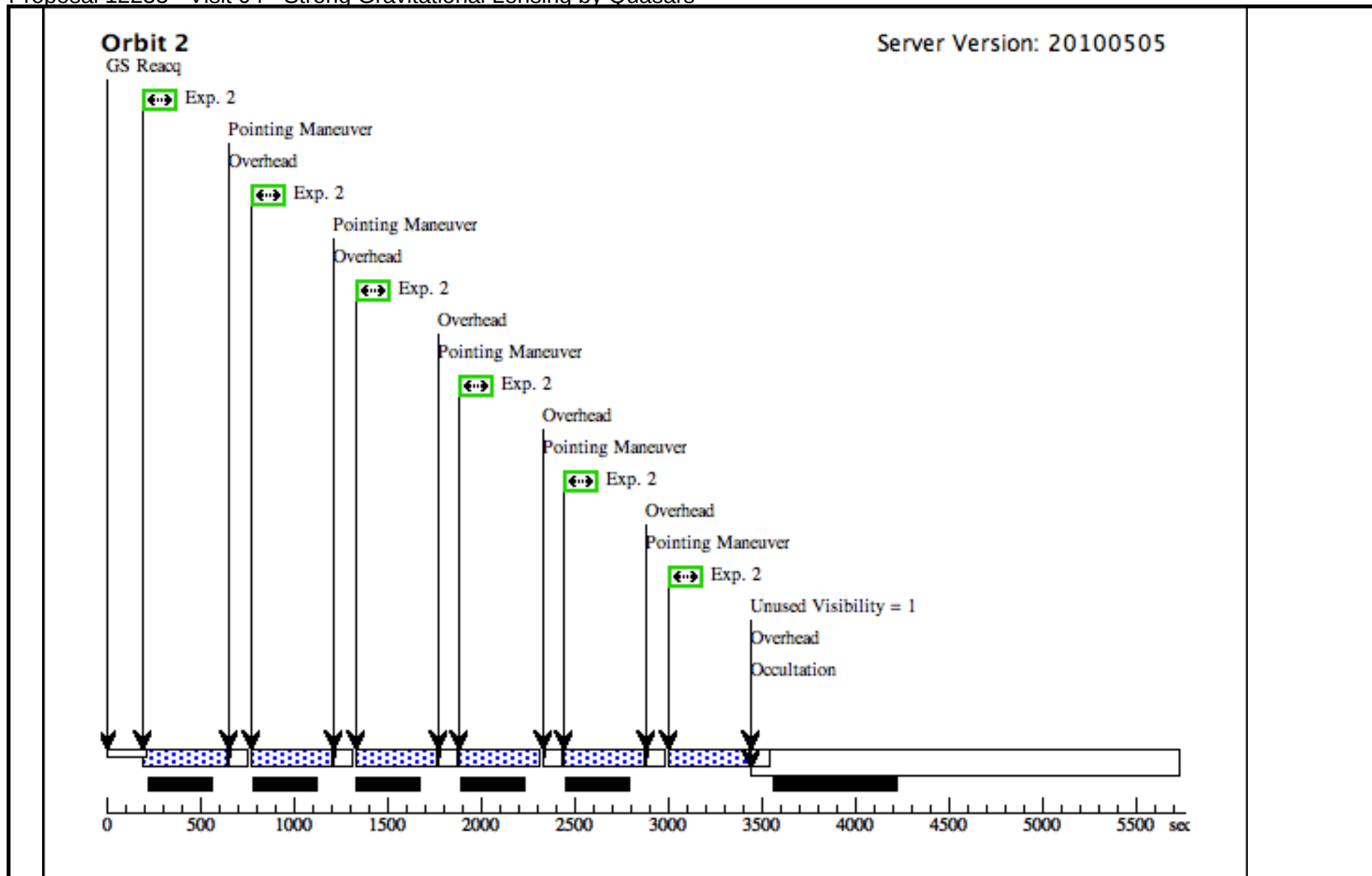




Proposal 12233 - Visit 03 - Strong Gravitational Lensing by Quasars

Visit	Proposal 12233, Visit 04 Wed Aug 18 19:37:53 GMT 2010									
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none)									
Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=6 Point Spacing=0.145 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false							(1), (2)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous	
	(5)	SDSSJ0827+5224	RA: 08 27 25.2000 (126.8550000d) Dec: +52 24 35.12 (52.40976d) Equinox: J2000				V=17.5		Reference Frame: ICRS	
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F475W	(5) SDSSJ0827+5224 4	WFC3/UVIS, ACCUM, UVIS1	F475W			Pattern 1, Exps 1-1 (1)	405 Secs	
									[==>410.0 Secs (Pattern 1)] [==>410.0 Secs (Pattern 2)] [==>410.0 Secs (Pattern 3)] [==>410.0 Secs (Pattern 4)] [==>410.0 Secs (Pattern 5)] [==>410.0 Secs (Pattern 6)]	[1]
	2	F814W	(5) SDSSJ0827+5224 4	WFC3/UVIS, ACCUM, UVIS1	F814W			Pattern 1, Exps 2-2 (1)	405 Secs	
									[==>429.0 Secs (Pattern 1)] [==>429.0 Secs (Pattern 2)] [==>429.0 Secs (Pattern 3)] [==>429.0 Secs (Pattern 4)] [==>429.0 Secs (Pattern 5)] [==>429.0 Secs (Pattern 6)]	[2]





Proposal 12233 - Visit 04 - Strong Gravitational Lensing by Quasars

Visit	Proposal 12233, Visit 05 Wed Aug 18 19:37:53 GMT 2010									
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none)									
Patterns	#	Primary Pattern				Secondary Pattern			Exposures	
	(3)	Pattern Type=WFC3-UVIS-DITHER- LINE Purpose=DITHER Number Of Points=4 Point Spacing=0.145 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false							(1), (2)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous	
	(4)	PSF-STARS-NGC136	RA: 00 31 23.0000 (7.8458333d) Dec: +61 29 47.00 (61.49639d) Equinox: J2000				V=15.0		Reference Frame: ICRS	
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(4) PSF-STARS-NGC136	WFC3/UVIS, ACCUM, UVIS1	F475W			Pattern 3, Exps 1-1 (3)	60 Secs	
									[==>64.0 Secs (Pattern 1)] [==>354.0 Secs (Pattern 2)] [==>354.0 Secs (Pattern 3)] [==>354.0 Secs (Pattern 4)]	[1]
	2		(4) PSF-STARS-NGC136	WFC3/UVIS, ACCUM, UVIS1	F814W			Pattern 3, Exps 2-2 (3)	60 Secs	
									[==>354.0 Secs (Pattern 1)] [==>354.0 Secs (Pattern 2)] [==>354.0 Secs (Pattern 3)] [==>64.0 Secs (Pattern 4)]	[1]

