



12555 - On the Triggering of Quasars During First Passage

Cycle: 19, 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) J0132-0931	ACS/WFC	1	22-Jul-2011 01:09:27.0	yes
11	(1) J0132-0931	WFC3/IR	1	22-Jul-2011 01:09:32.0	yes
02	(3) J0834+4914	ACS/WFC WFC3/IR	2	22-Jul-2011 01:09:37.0	yes
03	(4) J0933+3852	ACS/WFC WFC3/IR	2	22-Jul-2011 01:09:43.0	yes
04	(5) J1024+5556	ACS/WFC WFC3/IR	2	22-Jul-2011 01:09:50.0	yes
05	(7) J1211+3657	ACS/WFC WFC3/IR	2	22-Jul-2011 01:09:55.0	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>
06	(8) J1448+3559	ACS/WFC WFC3/IR	2	22-Jul-2011 01:10:01.0	yes
07	(9) J1605+5322	ACS/WFC WFC3/IR	2	22-Jul-2011 01:10:09.0	yes
08	(10) J1041-0002	ACS/WFC WFC3/IR	2	22-Jul-2011 01:10:14.0	yes
09	(12) J2049-0012	ACS/WFC WFC3/IR	2	22-Jul-2011 01:10:21.0	yes
10	(13) J2130-0703	ACS/WFC WFC3/IR	2	22-Jul-2011 01:10:26.0	yes

20 Total Orbits Used

ABSTRACT

Merger induced quasar (QSO) activity is commonly invoked as a principal mechanism responsible for the growth of central super-massive black holes (SMBHs) and concurrent evolution of their host galaxies. Despite the apparent successes of such models in reproducing global populations and distributions, fundamental questions surrounding the fueling of SMBHs remain untested. In particular, theoretical treatments predict that the evolution of the BHs during a merger is determined by their host galaxy's bulge component. We will test this observationally by imaging 10 early-stage merging pairs of galaxies where one galaxy is in a quasar phase and the other is not. By selecting a sample of merging galaxies after first close passage but before final coalescence, we may study the early stages of the merger and precisely determine the properties of the progenitors. This allows a unique 1-to-1 comparison of the QSO-host and companion galaxy that cannot be attained with any other sample. In this manner, we will establish whether quasar triggering is sensitive to the host galaxy morphology. Analysis of the morphologies and stellar masses will also equip us to tackle other key questions related to quasar evolution and triggering. The proposed imaging will constrain the stellar masses of each galaxy to characterize the merger mass ratios that trigger QSO activity. Lastly, comparisons of the SMBH to the host bulge mass, at this intermediate stage, will offer new insights into the path SMBHs take on their way to the Magorrian relation.

OBSERVING DESCRIPTION

Proposal 12555 (STScI Edit Number: 0, Created: Friday, July 22, 2011 12:10:30 AM EST) - Overview

Sample Selection: We propose to obtain ACS/F625W and WFC3/F160W band imaging of 10 QSO/galaxy pairs.

This sample includes 10 pairs that meet the following criteria to maximize the likelihood they have undergone a first passage interaction:

*In each pair, the quasar is a member of the Schneider (2010) SDSS quasar catalog. This vetted catalog allows us to insure that we are indeed looking at quasars and not misclassifications by the SDSS spectroscopic pipeline.

* $25 \text{ kpc} < \text{Projected distance} < 80 \text{ kpc}$: Looking at each object in the Schneider catalog we look for objects that fall within a physical distance that is consistent with having interacted with the quasar and not be in a final coalescence stage. This distance range is motivated by galaxy merger simulations (e.g., GalMer; Chilingarian et al. 2010).

* Redshift difference $d z_{\{\text{QSO, gal}\}} < 0.005$ (i.e. $|dv| < 1500 \text{ km/s}$): This demands that the objects are very likely to be physically associated. The limit is the characteristic difference in redshift one expects in a merging system summed in quadrature with the characteristic error on quasar redshifts. The redshift determination for the companion galaxies is either from SDSS or our own ongoing survey with the Lick Observatory's Kast spectrograph at the Shane 3-meter telescope.

* The companion galaxy must show signs of ongoing star formation or some AGN activity. These signs indicate that the galaxy has a reservoir of gas ruling out the possibility that its SMBH is a not QSO simply due to a lack of gas.

* $z_{\{\text{QSO}\}} < 0.4$: This insures that the angular size of the quasar host galaxy bulge is likely to extend past the PSF of the quasar.

* $r_{\{\text{gal}\}} \leq 22$: This permits sufficient S/N in a modest integration time.

*The QSO cannot be near a known galaxy cluster. We use the MaxBCG (Koester+2007) catalog which is 85-90% complete for $0.1 < z < 0.3$. We choose objects to be far away from clusters either projected on the sky ($> 1 \text{ Mpc}$) or in redshift ($dz > 0.05$).

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We note that the only candidate above $z=0.3$ (the upper limit of the completeness of the MaxBCG catalog) is J2049-0012 which has a bridge of emission connecting the quasar to the companion galaxy in our Shane/Kast slit spectra. This bridge confirms the galaxies are interacting. Another galaxy that has such a bridge is J1211+3657. Spectra and SDSS imaging of some of our pairs can be seen in Fig. 1 of our proposal.

Choice of Filters/Instruments

Our science goals demand color and morphology information of the QSO host galaxy and its companion. The two filters are necessary for determining an unbiased stellar mass estimate for correct bulge/disk decomposition. Depth of the observations also is critical since the detection of tidal features acts as a "smoking gun" for merger interactions.

We choose to image with WFC3/F160W and ACS/F625W in order to optimize our ability to detect tidal features as well as to characterize the stellar populations. We select the F160W filter to characterize the older stellar populations that trace the majority of the stellar mass of the galaxies.

WFC3 is the clear choice for NIR imaging.

To measure light coming from younger bluer stars (to better characterize the stellar mass and characterize where newer star formation has occurred) we pair these observations with a bluer filter. Since the quasar host galaxy has a bright and strongly ionizing source that can contaminate the filter, we had to weigh options such that we maximized the galaxy contribution to the light and avoided as many strong emission lines as possible. Also, since we are attempting to image faint tidal features we needed to use a wide filter. We selected the F625W (r^{\prime}) band so that the filter falls above the restframe 4000 Å break while avoiding contamination from H α . This bluer filter will also give us a higher resolution image of the QSO PSF that is crucial in its subtraction. We choose to use ACS for imaging in this bluer band due to its higher throughput than WFC3's UVIS imaging in this wavelength region.

Exposure Time Estimates:

r F625W band: Deep imaging is a prerequisite to measure morphologies and detect faint tidal features. Tidal features can be faint with surface brightnesses < 25 mags/arcsecond² (e.g. Schombert et al. 1990). Accounting for overheads, with 1 orbit of exposure time (~ 2400 s), we will detect 25 mags/arcsecond² features at a signal-to-noise ratio of 1.71 per pixel (ACS ETC). The signal-to-noise per pixel is the relevant measure of the

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noise for galaxy component fitting (e.g., GALFIT or GIM2D). As tidal features span many pixels (see Fig.~3), the detection of a tidal feature will be much higher signal-to-noise. Experience of the Co-Is tells us that this is sufficient to achieve our science goals.

H F160W band: In a similar exposure time using the F160W we will be able reach nearly the same signal to noise ratio per pixel (1.79) for surfaces brightnesses at a considerably fainter 27 mags/arcsecond² (WFC3 ETC). This deeper image is crucial for building a baseline stellar mass image that will allow us to detect tidal features and more accurately perform bulge-disk decomposition and ultimately extract a quasar host galaxy bulge mass.

The Need for HST:

We emphasize that the only instrument capable of performing this study is HST. Since there are no local systems we can study, we must study moderate redshift ($z > 0.1$) objects. This requires high spatial resolution imaging for proper subcomponent fitting and accurate removal of the central (quasar) point source. In the optical the only option is HST.

In the NIR, the lack of a stable PSF renders this study hopeless with even the most advanced modern adaptive optics system; imperfections quickly wash out any possible signal for the host galaxies and destroy the signal from central regions of the galaxies (e.g., Fig. 2 of our proposal). These central regions are fundamental to our study as they contain the bulge.

Strategies for PSF Subtraction:

Co-I Rosario is experienced in PSF subtraction of quasars from host galaxy spectrum. This thorny problem will be attacked with a variety of time-tested techniques. In his experience a combination of archival WFC3 data from the UDF and ERS2 fields has been effective in characterizing the PSF of the instrument. Additionally, excellent results can be obtained by drizzling TinyTim model PSFs. As stated above, the contribution of the bluer filter will be a powerful tool to allow us to constrain the point source contamination in the NIR.

Strategies for Component Fitting:

GIM2D will be applied to the images, account for the PSF, to derive disk and bulge sizes, bulge to disk ratios, disk inclinations and position angles. Furthermore we will attempt multiple component fits of each filter separately and combined. Co-I Mark Mozena has extensive experience using GIM2D and GALFIT on HST observations of DEEP fields. GIM2D was developed at UCSC by Luc Simard.

Simulating Our Observations:

Using a galaxy merger simulation run by Co-I Cox, we have applied our techniques on an intermediate stage galaxy merger similar to the type we propose to image. This system is simulated at redshift 0.2 and features 2 galaxies with stellar masses of $5 \times 10^{10} M_{\text{sun}}$ and B/T mass ratio of 0.2. We scaled the simulation to the observed size at $z=0.2$, ran it through the Sunrise radiative transfer code (Jonsson 2010) to create images consistent with our filters, and added noise consistent with that predicted by the ETC and a PSF source to simulate the QSO.

Proposal 12555 - Visit 01 - On the Triggering of Quasars During First Passage

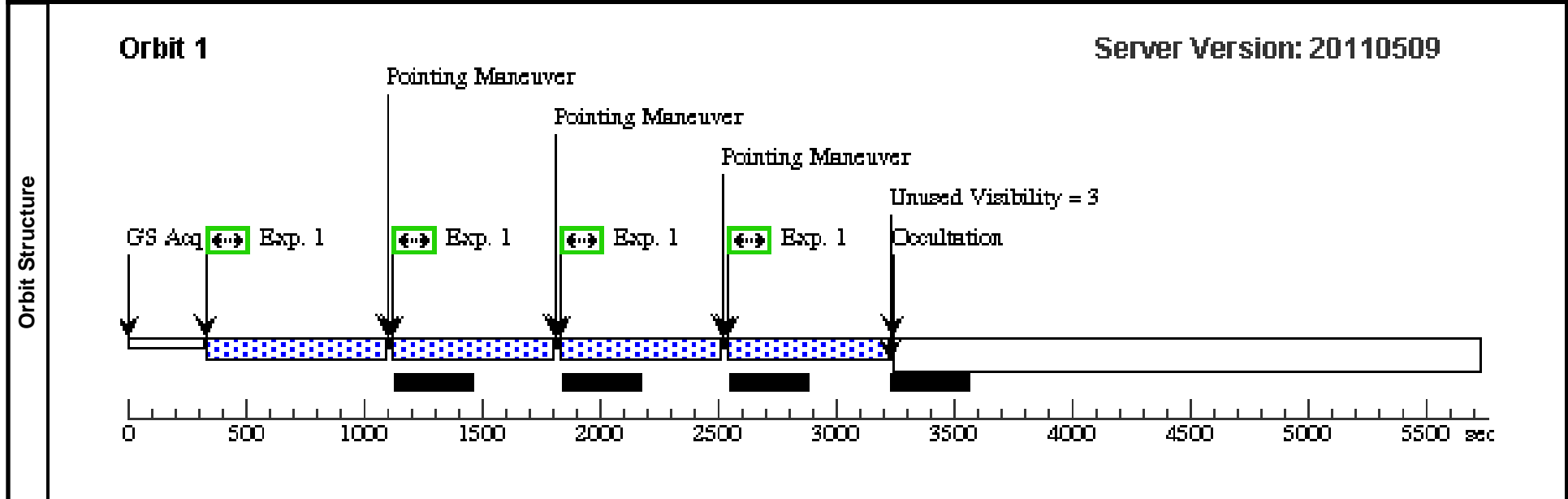
Fri Jul 22 05:10:31 GMT 2011

Visit	Proposal 12555, Visit 01, implementation		
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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
	(1)	J0132-0931	RA: 01 32 3.4600 (23.0144167d) Dec: -09 31 53.60 (-9.53156d) Equinox: J2000		V=18.2	Reference Frame: ICRS

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) J0132-0931	ACS/WFC, ACCUM, WFC1	F606W				Pattern 2, Exps 1-1 i n Visit 01 (2)	670 Secs [=>553.0 Secs (Pattern 1)] [=>553.0 Secs (Pattern 2)] [=>553.0 Secs (Pattern 3)] [=>553.0 Secs (Pattern 4)]



Proposal 12555 - Visit 11 - On the Triggering of Quasars During First Passage

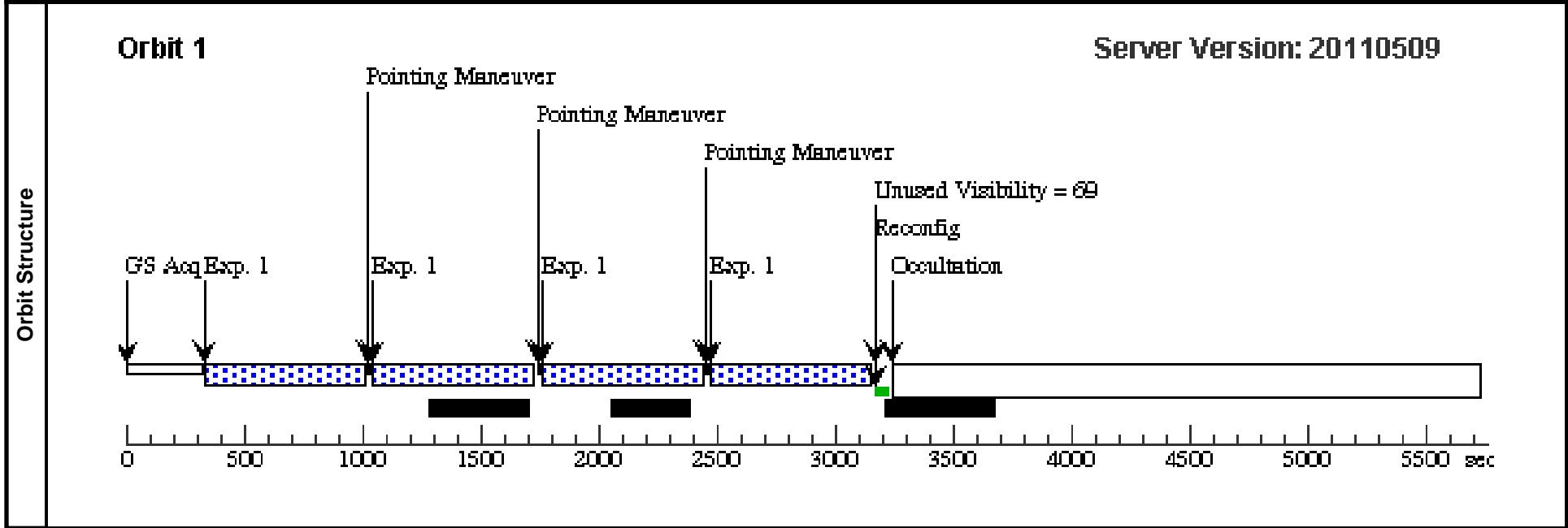
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Visit	Proposal 12555, Visit 11		
	Diagnostic Status: No Diagnostics		
	Scientific Instruments: WFC3/IR		
	Special Requirements: (none)		

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Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	J0132-0931	RA: 01 32 3.4600 (23.0144167d) Dec: -09 31 53.60 (-9.53156d) Equinox: J2000		V=18.2	Reference Frame: ICRS

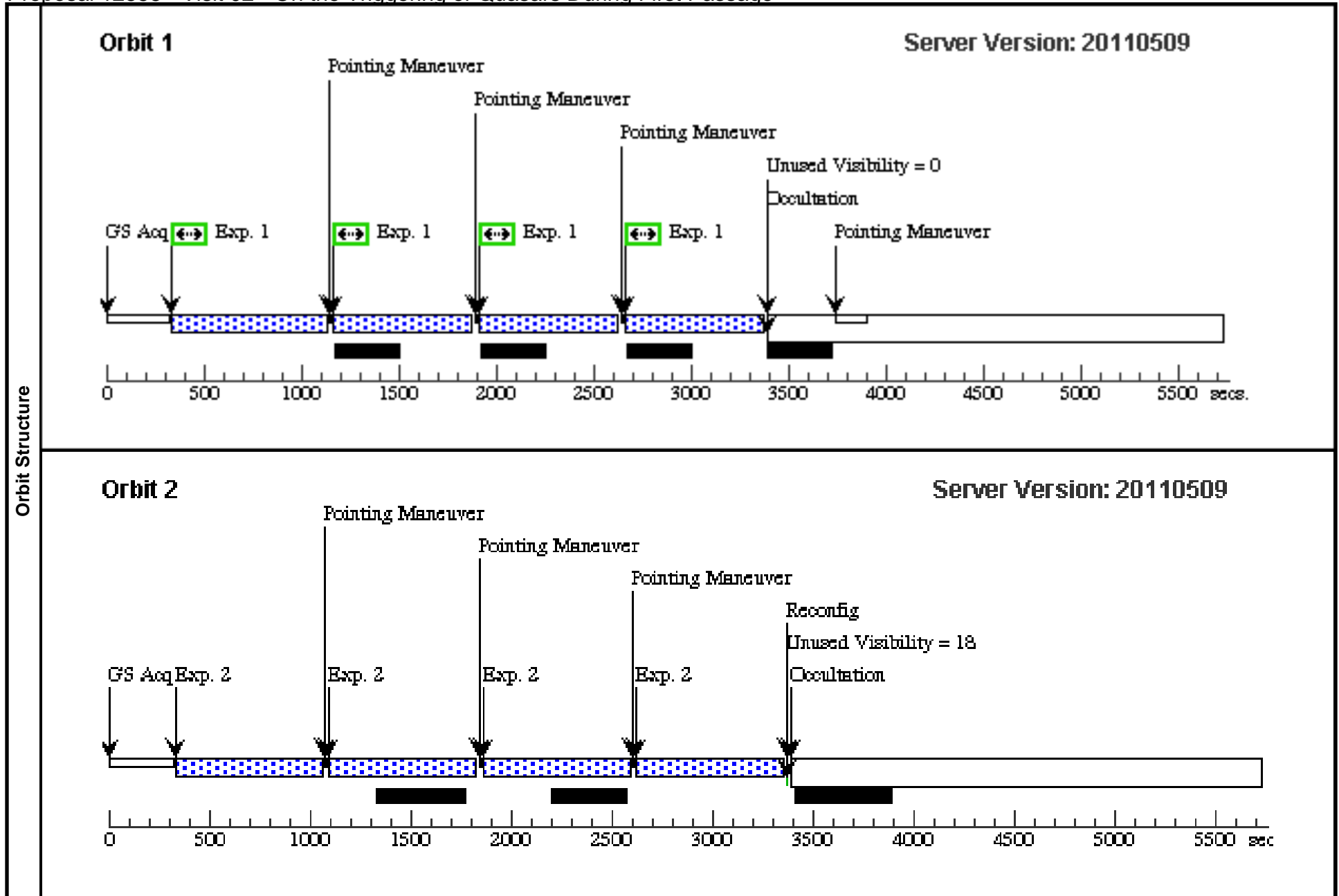
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) J0132-0931	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 50; NSAMP=14	POS TARG 0,null; GS ACQ SCENARI O BASE1B3	Pattern 1, Exps 1-1 in Visit 11 (1)	[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[1]



Proposal 12555 - Visit 02 - On the Triggering of Quasars During First Passage

Fri Jul 22 05:10:32 GMT 2011

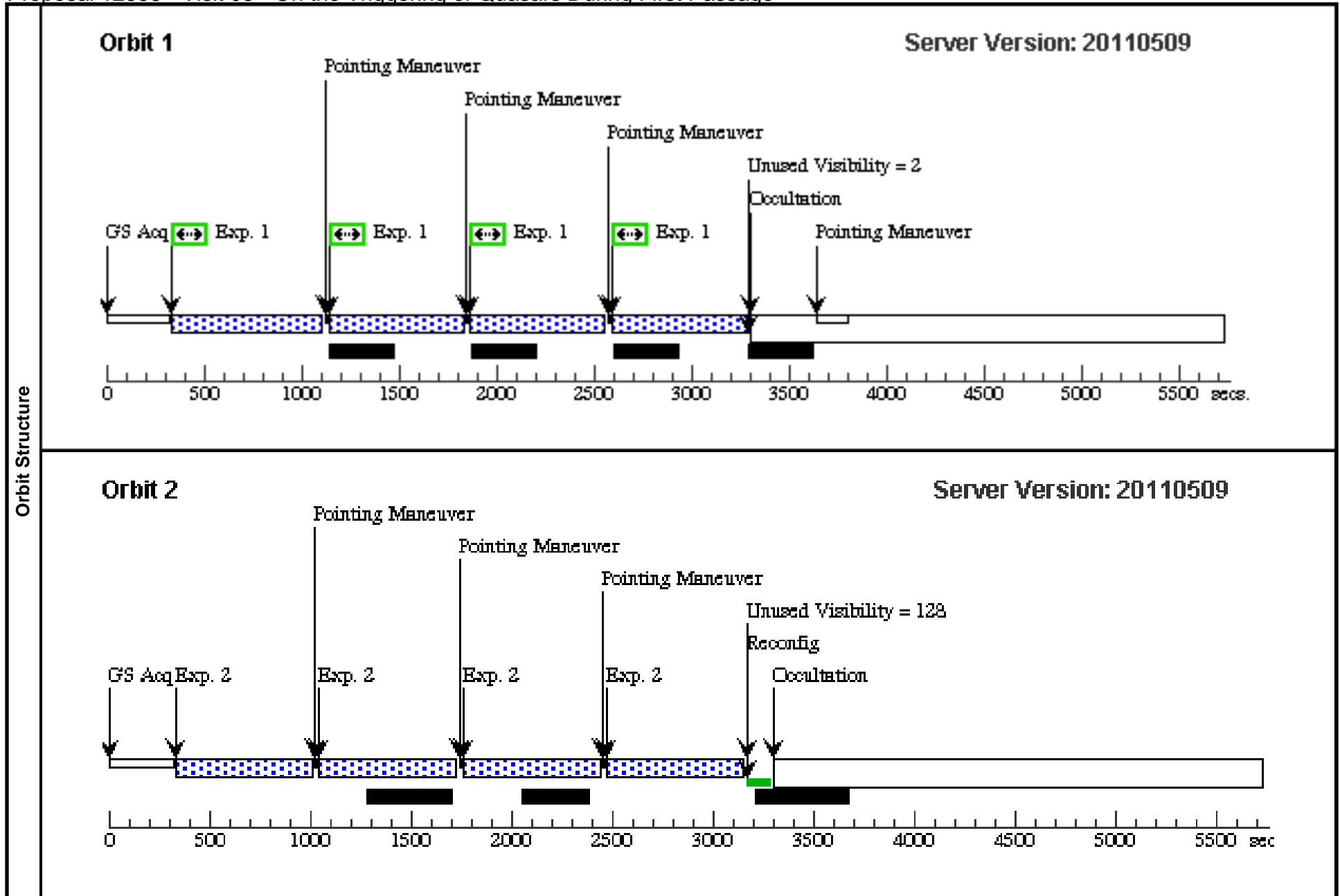
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(2)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false			(1)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(3)	J0834+4914	RA: 08 34 17.9000 (128.5745833d) Dec: +49 14 39.20 (49.24422d) 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		(3) J0834+4914	ACS/WFC, ACCUM, WFC1	F606W				Pattern 2, Exps 1-1 in Visit 02 (2) 670 Secs [==>591.0 Secs (Pattern 1)] [==>591.0 Secs (Pattern 2)] [==>591.0 Secs (Pattern 3)] [==>591.0 Secs (Pattern 4)]	[1]
2		(3) J0834+4914	WFC3/IR, MULTIACCUM, IR	F160W		SAMP-SEQ=SPARS POS TARG 0,null 50; NSAMP=15		Pattern 1, Exps 2-2 in Visit 02 (1) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	



Proposal 12555 - Visit 03 - On the Triggering of Quasars During First Passage

Fri Jul 22 05:10:32 GMT 2011

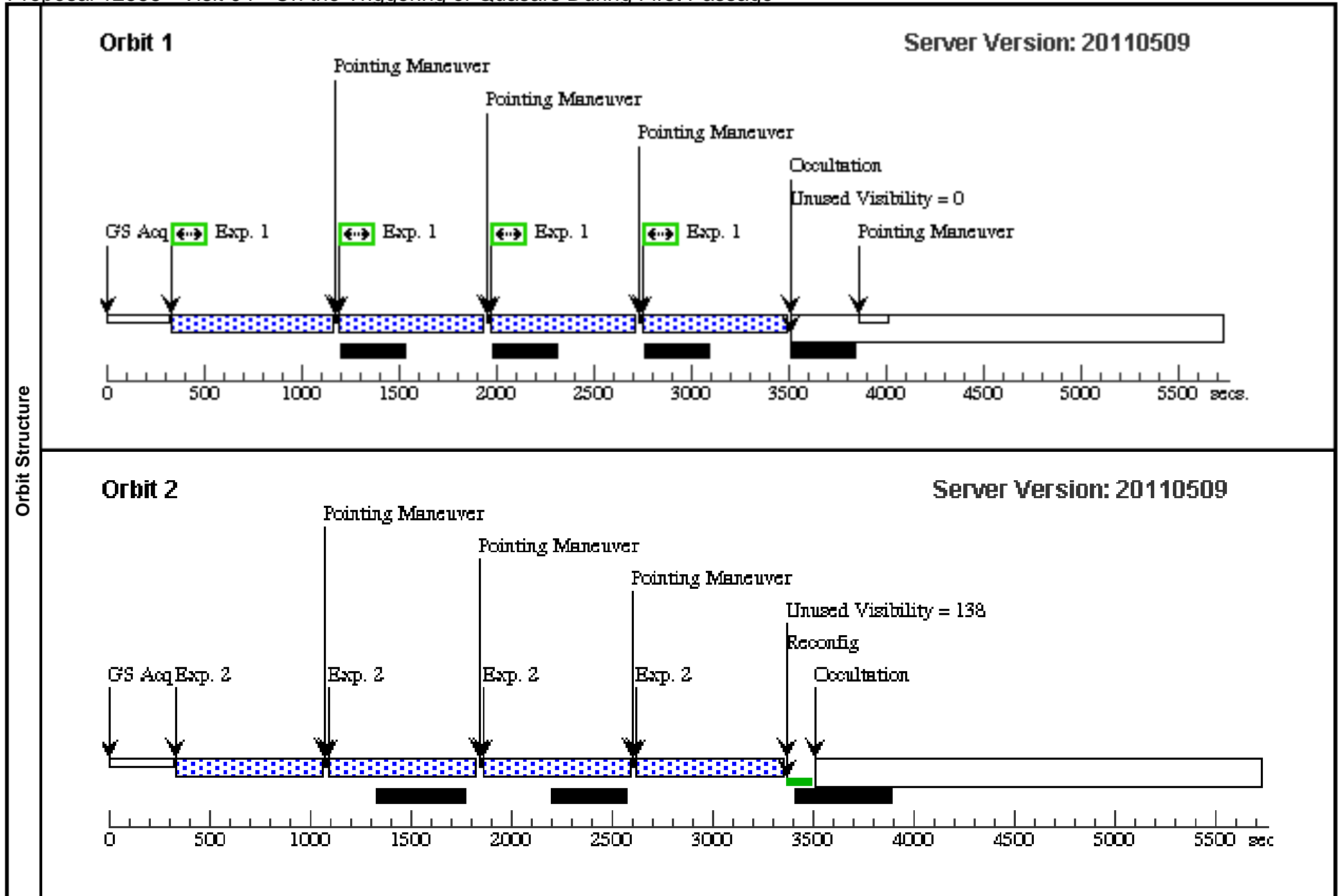
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Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(4)	J0933+3852	RA: 09 33 2.6800 (143.2611667d) Dec: +38 52 16.80 (38.87133d) Equinox: J2000		V=17.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(4) J0933+3852	ACS/WFC, ACCUM, WFC1	F606W				Pattern 2, Exps 1-1 in Visit 03 (2) 670 Secs [==>568.0 Secs (Pattern 1)] [==>568.0 Secs (Pattern 2)] [==>568.0 Secs (Pattern 3)] [==>568.0 Secs (Pattern 4)]	[1]
2		(4) J0933+3852	WFC3/IR, MULTIACCUM, IR	F160W		SAMP-SEQ=SPARS POS TARG 0,null 50; NSAMP=14		Pattern 1, Exps 2-2 in Visit 03 (1) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	



Proposal 12555 - Visit 04 - On the Triggering of Quasars During First Passage

Fri Jul 22 05:10:33 GMT 2011

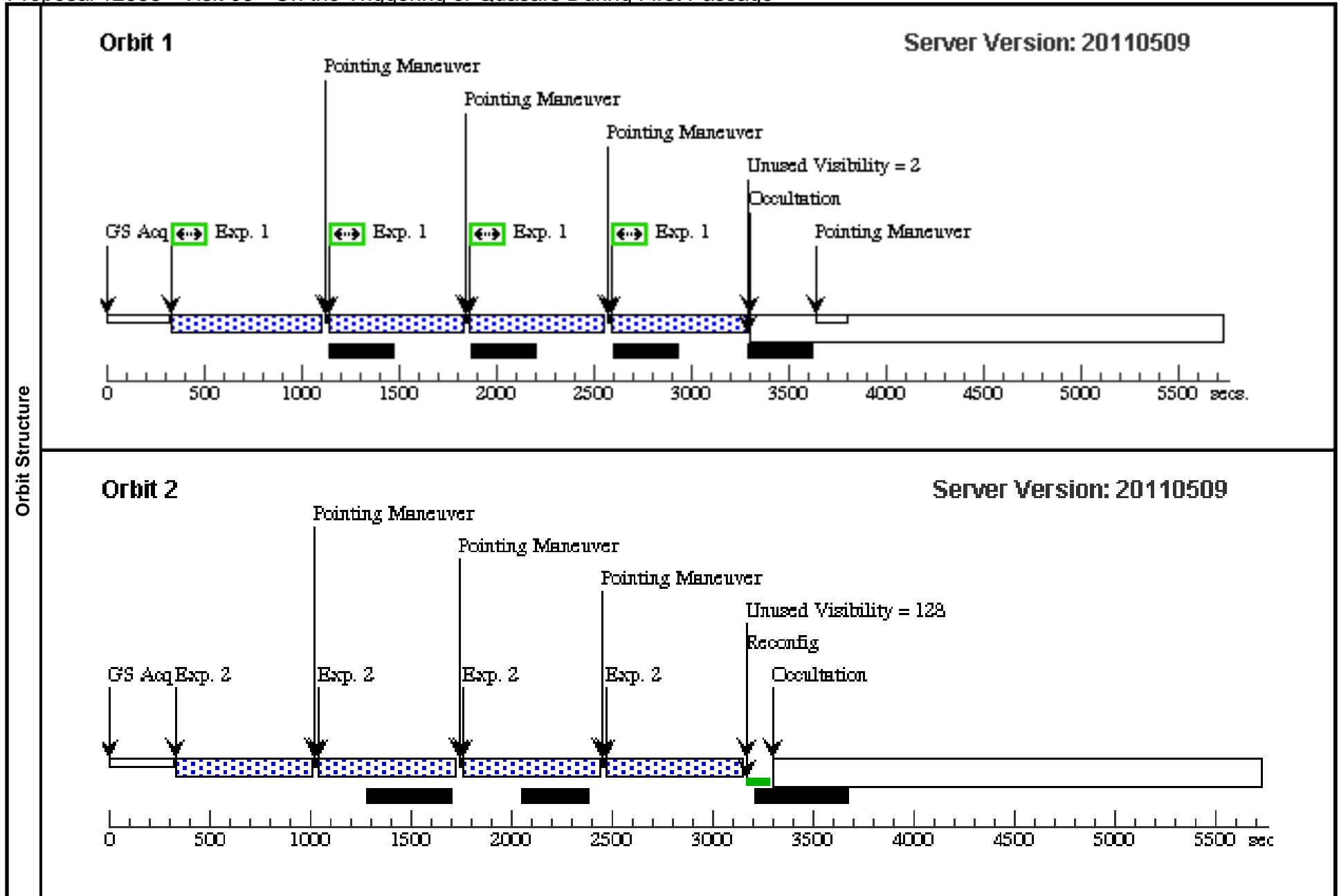
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(2)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false				(1)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(5)	J1024+5556	RA: 10 24 34.7100 (156.1446250d) Dec: +55 56 26.40 (55.94067d) Equinox: J2000		V=17.9	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(5) J1024+5556	ACS/WFC, ACCUM, WFC1	F606W				Pattern 2, Exps 1-1 in Visit 04 (2) 670 Secs [==>621.0 Secs (Pattern 1)] [==>621.0 Secs (Pattern 2)] [==>621.0 Secs (Pattern 3)] [==>621.0 Secs (Pattern 4)]	[1]
2		(5) J1024+5556	WFC3/IR, MULTIACCUM, IR	F160W		SAMP-SEQ=SPARS POS TARG 0,null 50; NSAMP=15		Pattern 1, Exps 2-2 in Visit 04 (1) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	



Proposal 12555 - Visit 05 - On the Triggering of Quasars During First Passage

Fri Jul 22 05:10:33 GMT 2011

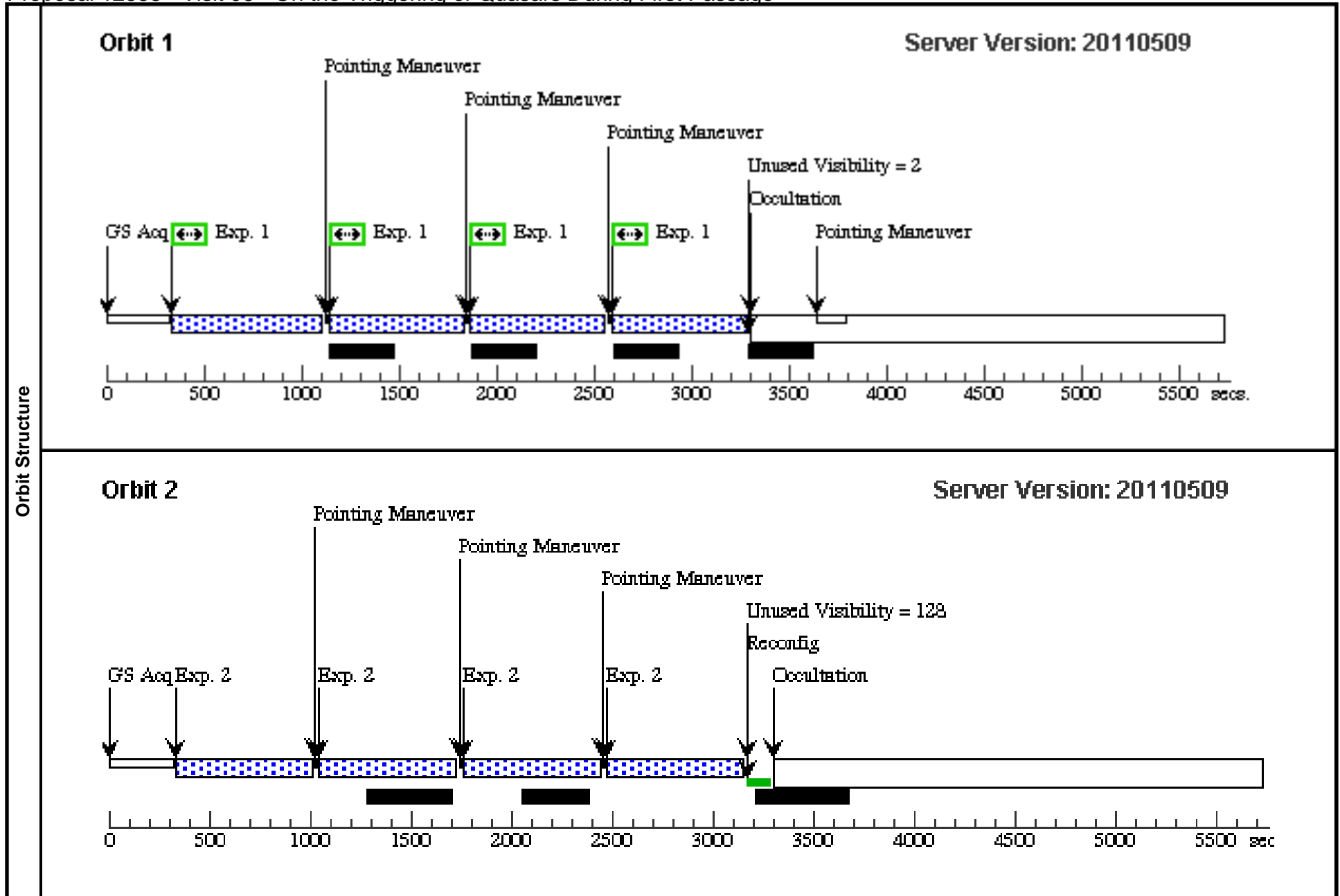
Visit		Proposal 12555, Visit 05, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: (none)								
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(2)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false			(1)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(7)	J1211+3657	RA: 12 11 14.5600 (182.8106667d) Dec: +36 57 39.60 (36.96100d) Equinox: J2000		V=16.7	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(7) J1211+3657	ACS/WFC, ACCUM, WFC1	F606W				Pattern 2, Exps 1-1 in Visit 05 (2) 670 Secs [==>568.0 Secs (Pattern 1)] [==>568.0 Secs (Pattern 2)] [==>568.0 Secs (Pattern 3)] [==>568.0 Secs (Pattern 4)]	[1]
2		(7) J1211+3657	WFC3/IR, MULTIACCUM, IR	F160W		SAMP-SEQ=SPARS POS TARG 0,null 50; NSAMP=14		Pattern 1, Exps 2-2 in Visit 05 (1) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	



Proposal 12555 - Visit 06 - On the Triggering of Quasars During First Passage

Fri Jul 22 05:10:34 GMT 2011

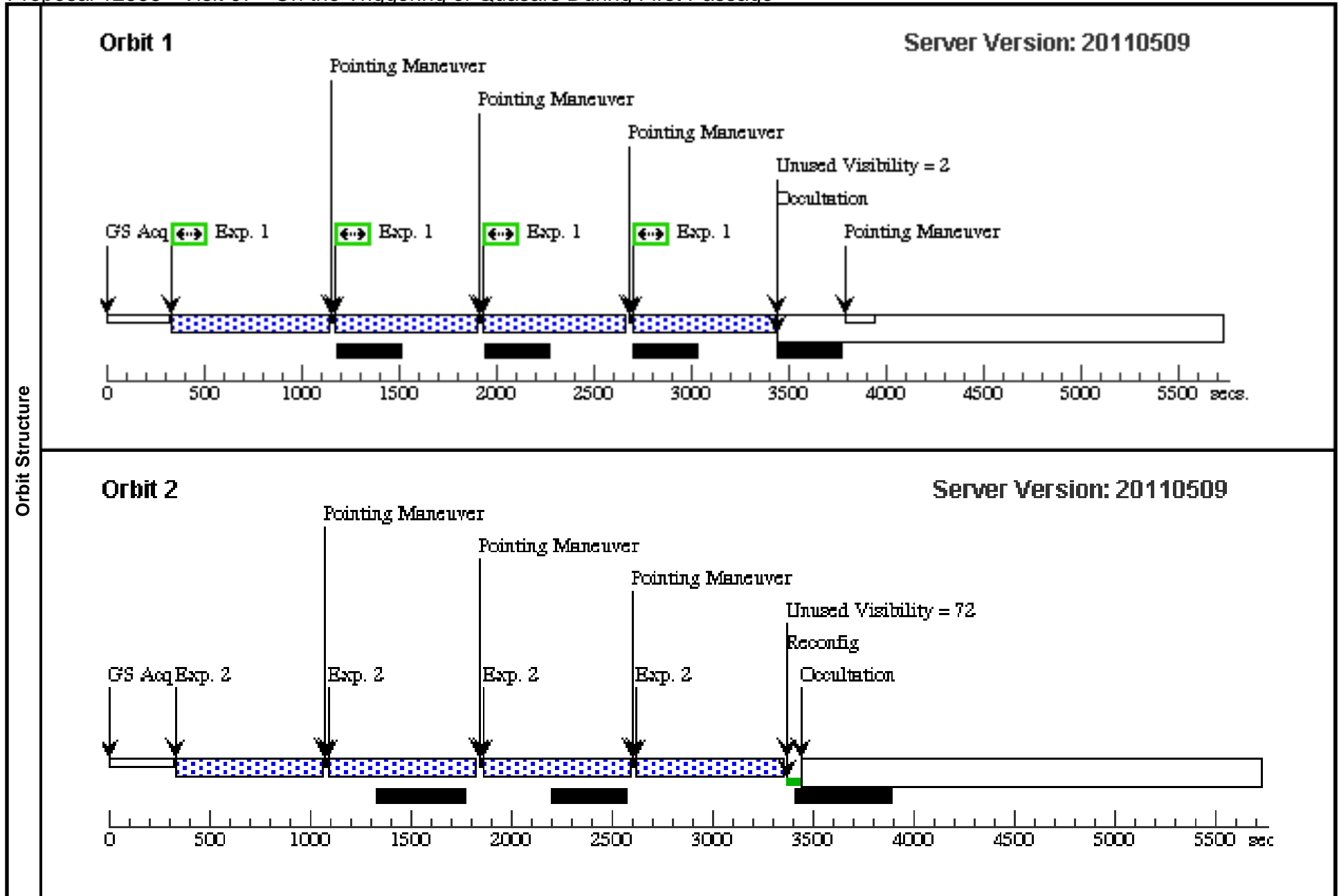
Visit	Proposal 12555, Visit 06, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: (none)									
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Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(8)	J1448+3559	RA: 14 48 25.0900 (222.1045417d) Dec: +35 59 46.60 (35.99628d) Equinox: J2000		V=16.6	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(8) J1448+3559	ACS/WFC, ACCUM, WFC1	F606W				Pattern 2, Exps 1-1 in Visit 06 (2) 670 Secs [==>568.0 Secs (Pattern 1)] [==>568.0 Secs (Pattern 2)] [==>568.0 Secs (Pattern 3)] [==>568.0 Secs (Pattern 4)]	[1]
2		(8) J1448+3559	WFC3/IR, MULTIACCUM, IR	F160W		SAMP-SEQ=SPARS POS TARG 0,null 50; NSAMP=14		Pattern 1, Exps 2-2 in Visit 06 (1) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	



Proposal 12555 - Visit 07 - On the Triggering of Quasars During First Passage

Fri Jul 22 05:10:34 GMT 2011

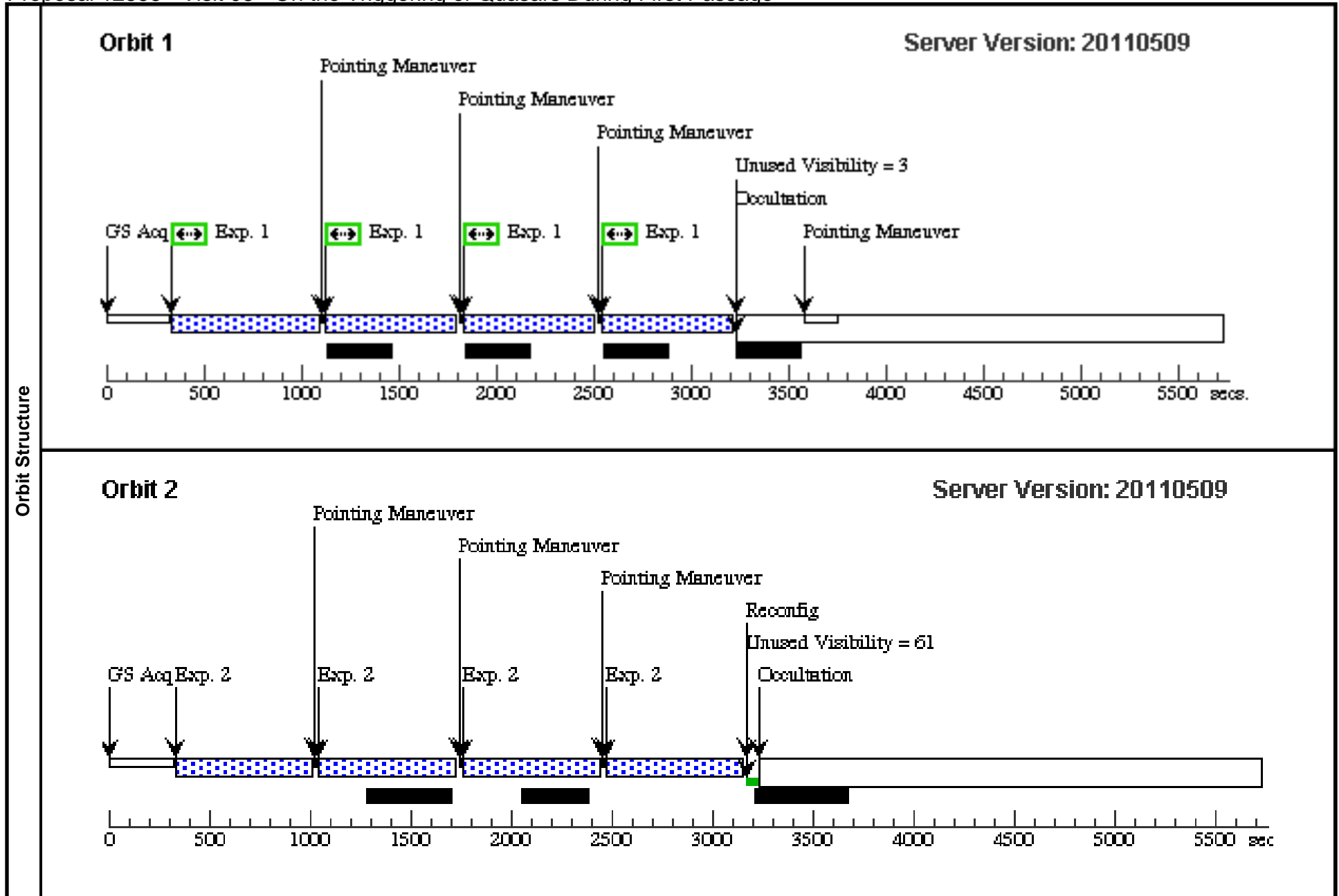
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(2)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false			(1)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(9)	J1605+5322	RA: 16 05 45.9000 (241.4412500d) Dec: +53 22 10.70 (53.36964d) Equinox: J2000		V=17.6	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(9) J1605+5322	ACS/WFC, ACCUM, WFC1	F606W				Pattern 2, Exps 1-1 in Visit 07 (2) 670 Secs [==>604.0 Secs (Pattern 1)] [==>604.0 Secs (Pattern 2)] [==>604.0 Secs (Pattern 3)] [==>604.0 Secs (Pattern 4)]	[1]
2		(9) J1605+5322	WFC3/IR, MULTIACCUM, IR	F160W		SAMP-SEQ=SPARS POS TARG 0,null 50; NSAMP=15		Pattern 1, Exps 2-2 in Visit 07 (1) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	



Proposal 12555 - Visit 08 - On the Triggering of Quasars During First Passage

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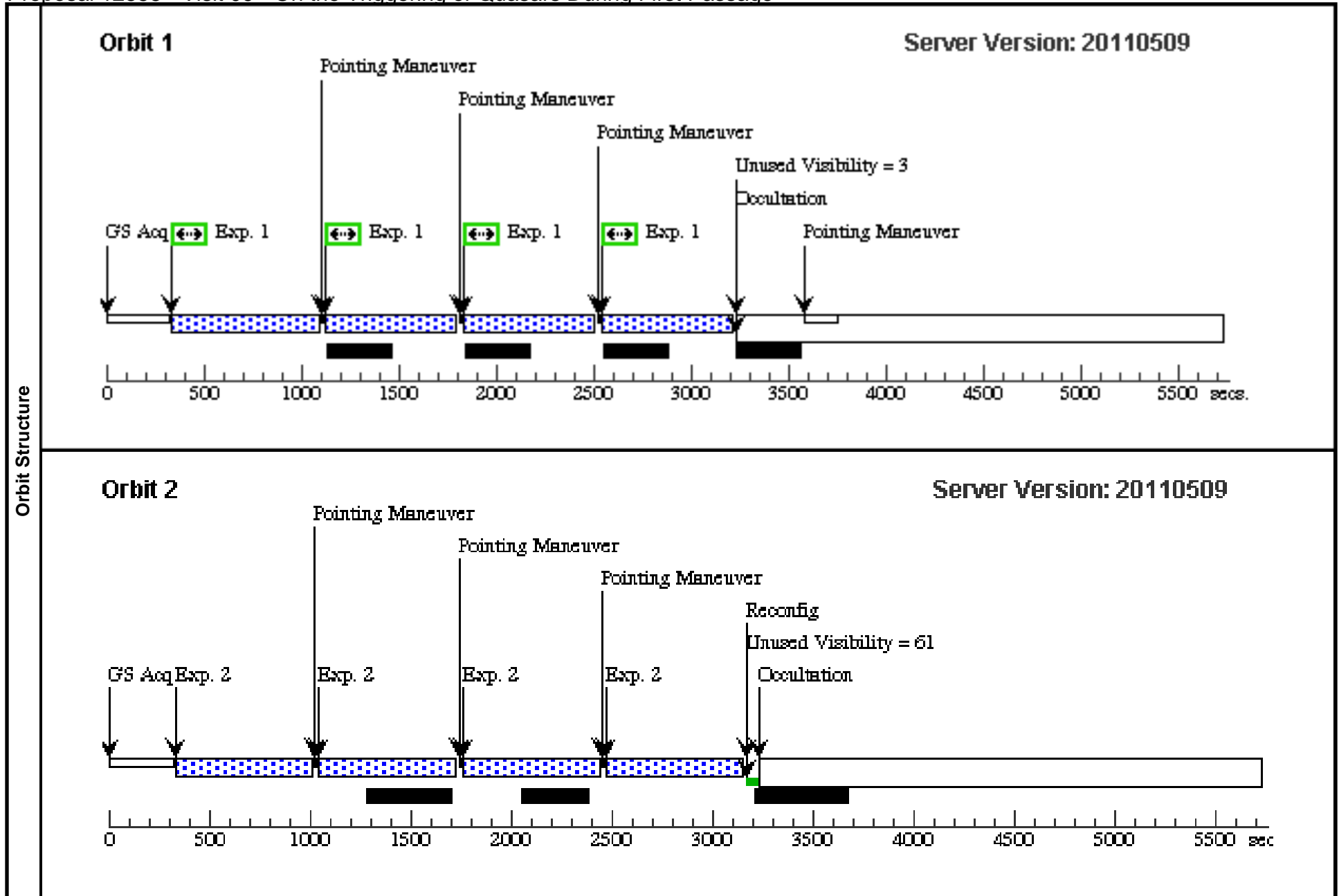
Visit	Proposal 12555, Visit 08, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: (none)									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)				
	(2)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false		(1)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(10)	J1041-0002	RA: 10 41 33.4300 (160.3892917d) Dec: -00 02 36.30 (-.04342d) Equinox: J2000		V=18.3	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(10) J1041-0002	ACS/WFC, ACCUM, WFC1	F606W				Pattern 2, Exps 1-1 in Visit 08 (2) 670 Secs [==>551.0 Secs (Pattern 1)] [==>551.0 Secs (Pattern 2)] [==>551.0 Secs (Pattern 3)] [==>551.0 Secs (Pattern 4)]	[1]
2		(10) J1041-0002	WFC3/IR, MULTIACCUM, IR	F160W		SAMP-SEQ=SPARS POS TARG 0,null 50; NSAMP=14		Pattern 1, Exps 2-2 in Visit 08 (1) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	



Proposal 12555 - Visit 09 - On the Triggering of Quasars During First Passage

Fri Jul 22 05:10:35 GMT 2011

Visit	Proposal 12555, Visit 09, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: (none)									
	#	Primary Pattern	Secondary Pattern	Exposures						
Patterns	(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false	(2)						
	(2)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false	(1)						
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(12)	J2049-0012	RA: 20 49 56.6100 (312.4858750d) Dec: -00 12 1.70 (-.20047d) Equinox: J2000		V=17.9	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(12) J2049-0012	ACS/WFC, ACCUM, WFC1	F606W				Pattern 2, Exps 1-1 in Visit 09 (2) 670 Secs [==>551.0 Secs (Pattern 1)] [==>551.0 Secs (Pattern 2)] [==>551.0 Secs (Pattern 3)] [==>551.0 Secs (Pattern 4)]	[1]
2		(12) J2049-0012	WFC3/IR, MULTIACCUM, IR	F160W		SAMP-SEQ=SPARS POS TARG 0,null 50; NSAMP=14		Pattern 1, Exps 2-2 in Visit 09 (1) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	



Proposal 12555 - Visit 10 - On the Triggering of Quasars During First Passage

Fri Jul 22 05:10:35 GMT 2011

Visit		Proposal 12555, Visit 10, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC 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=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false			(2)				
(2)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.265 Line Spacing=0.187	Coordinate Frame=POS-TARG Pattern Orientation=20.67 Angle Between Sides=69.05 Center Pattern=false			(1)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(13)	J2130-0703	RA: 21 30 26.7400 (322.6114167d) Dec: -07 03 20.60 (-7.05572d) Equinox: J2000		V=17.1	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(13) J2130-0703	ACS/WFC, ACCUM, WFC1	F606W				Pattern 2, Exps 1-1 in Visit 10 (2) 670 Secs [==>553.0 Secs (Pattern 1)] [==>553.0 Secs (Pattern 2)] [==>553.0 Secs (Pattern 3)] [==>553.0 Secs (Pattern 4)]	[1]
2		(13) J2130-0703	WFC3/IR, MULTIACCUM, IR	F160W		SAMP-SEQ=SPARS POS TARG 0,null 50; NSAMP=14		Pattern 1, Exps 2-2 in Visit 10 (1) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	

