12590 - Galaxy Assembly at High Densities: HST Dissection of a Cluster at z=1.62

Cycle: 19, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) IRC0218A-CENTER-G102	WFC3/IR	2	12-Oct-2011 21:41:57.0	yes
02	(1) IRC0218A-CENTER-G102	WFC3/IR	2	12-Oct-2011 21:42:10.0	yes
03	(1) IRC0218A-CENTER-G102	WFC3/IR	2	12-Oct-2011 21:42:22.0	yes
04	(1) IRC0218A-CENTER-G102	WFC3/IR	2	12-Oct-2011 21:42:32.0	yes
05	(1) IRC0218A-CENTER-G102	WFC3/IR	2	12-Oct-2011 21:42:44.0	yes
06	(3) IRC0218A-F105W	WFC3/IR	1	12-Oct-2011 21:42:53.0	yes
07	(4) IRC0218A-ACS	ACS/WFC	2	12-Oct-2011 21:43:03.0	yes
08	(4) IRC0218A-ACS	ACS/WFC	2	12-Oct-2011 21:43:13.0	yes
09	(2) IRC0218A-WFC3-OFFSET	WFC3/IR	2	12-Oct-2011 21:43:24.0	yes

17 Total Orbits Used

ABSTRACT

The study of high redshift cluster galaxies near the epoch at which they form their stars provides the most diagnostic power on models of galaxy formation, which make strong predictions for galaxy evolution in these high density environments. This motivates the study of cluster galaxies at redshifts > 1.5, where most of the stars in cluster galaxies form, and the clusters assemble. Here we propose a detailed study of galaxy evolution in one galaxy cluster at z=1.62 using HST/ACS and WFC3 imagining, and WFC3 spectroscopy. This galaxy cluster was identified solely as an overdensity of Spitzer/IRAC sources with red IRAC colors, with little bias toward optically red or blue galaxies. The cluster has only 12 spectroscopic redshifts, mostly for active and star-forming galaxies, and measuring redshifts for most of the passive galaxies is beyond the capabilities of ground-based telescopes. The scientific goals of this proposal are (1) to measure spectroscopic redshifts of the red, passive galaxies to J(AB)=22.8 mag (~J* + 1 mag) in this cluster with the WFC3 grism in order to confirm cluster members and map the cluster in redshift space, (2) to measure the strength of the 4000 Angstrom/Balmer break from the grism spectra, providing valuable information on the galaxy stellar population ages and masses, (3) to measure the spatially resolved structures and faint, H(AB)=26 mag, subcomponents in these galaxies, constraining their assembly and formation histories, and (4) to use these observations to make comparisons to expectations from theoretical galaxy formation models.

OBSERVING DESCRIPTION

Observing Description for HST Cycle 19 Proposal 12590

PI: Casey Papovich (papovich@physics.tamu.edu)

We will observe the galaxy cluster IRC 0218A at z=1.6 with

-10 orbits of WFC3 G102 grism spectroscopy
- 1 orbit of WFC3 F105W imaging
- 2/3 orbit of WFC3 F125W imaging
- 4/3 orbit of WFC3 F160W imaging
- 2 orbits of ACS WFC F475W imaging
- 2 orbits of ACS WFC F814W imaging.

** WFC3 G102 Grism observations: (Visits 1-5)

While working on the Phase II with our Technical Contact, we discovered that there are no pointings with 2 suitable guide stars for optimal field pointing. For any combination of 2 guide stars, the cluster galaxies fall near the edge of the WFC3 FOV, and the allowable ORIENT angles cause the light dispersed by the grism to fall off the chip.

After much trial and error, we adopted a strategy using only a single guide star. We therefore have broken the 10 grism orbits into 5 separate visits of 2 orbits each. Also, because we are aware that some rotation is expected during an orbit using only 1 guide star, we are adopting the following strategy during each 2 orbit visit:

Orbit 1: direct (A) - grism (A) - grism (B) - direct (B) Orbit 2:

direct (C) - grism (C) - grism (D) -direct (D)

where ABCD are four different 1/2-integer pixel positions. We adopt the same dither positions as the standard WFC3-IR-DITHER-BOX pattern, but give the offsets explicitly so that we can effectively spread the dithers over two orbits. By placing a direct image at the beginning and end of each orbit we can track any rotation.

We have constrained Visit 1 (the first grism visit) to occur well in advance of Visits 2-5 (the other grism visits) so that we can verify that this plan produces good data before committing to Visits 2-5.

Using 1 guide star allows for a large range of ORIENT, and we constrain Visits 1-5 to each be separated by 10 deg in ORIENT. This will mitigate any collisions between spectra traces.

** WFC3 Imaging: (Visits 6, 9)

The F105W imaging is offset slightly from the cluster center coordinates. This is to include as many cluster members as possible. To include as many cluster members as possible, we have added an ORIENT constraint designed for optical field coverage (this includes a small associated group of galaxies to the NE of the cluster core).

For the F125W and F160W imaging, we have centered the field to minimze the overlap with existing WFC3 imaging from the CANDELS observations in this field. (CANDELS imaged with F125W and F160W and we avoid duplication.) There is a small overlap to include imaging of a cluster member that falls on the "death star" of the CANDELS WFC3

imaging. We have added an ORIENT constraint to minimze overlap with the existing CANDELS imaging. The constraint is ORIENT=40-50 deg.

The DITHER pattern we have adopted for the WFC3 F125W and F160W imaging is identical to that of CANDELS. CANDELS was constrained by the need for 1/2-integer pixel shifts in the primary WFC3 images and ACS parallels. While we have no ACS constraint (no parallels) we adopt the same dither pattern to allow for uniform F125W and F160W mosaic with CANDELS with a very similar PSF, etc.

For the F105W imaging, we adopt the standard WFC3-IR-DITHER-BOX.

We have checked that temporal variations in the sky background have a negligible impact on object S/N for our different observing windows. Therefore, we have no constrain owing to changes in background.

** ACS Imaging: (Visits 7, 8)

For the F475W and F814W images, we adopt a dither pattern to fill in the chip gap and include fraction pixel shifts. This uses the 2 pt DITHER-LINE pattern as the primary (to fill in the chip gap) and the DITHER-BOX as a subpattern, to take 4 pt dither at each position of the DITHER-LINE pattern. Because we take 2 x 4 ACS exposures we are not using CRSPLIT (=no). We have manually entered the "ACTUAL-DURATION" to each ACS exposure to fill in the visibility window for the orbit. (If the actual duration of the visibility window changes, we will manually change the ACTUAL DURACTIONS". To maximize the field overlap we have included a constraint that both images be taken with the same ORIENT, though the actual ORIENT is not

constained.

The ACS imaging is centered at a point to maximize overlap with the
WFC3 imaging (both from here and the CANDELS data).

Visit

Proposal 12590, Visit 01, implementation Thu Oct 13 01:43:33 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: ORIENT 49D TO 50 D; ORIENT 0.0D TO 0.0 D

Comments: We were unable to achieve two suitable guide stars for high-priority galaxies, such that they would lie on the WFC3 detector and have the light dispersed from the grism falling on the detector. We are using a single guide star for all grism observations. This star allows us to use the optimal pointing and gives a range of U3=48-90 deg. We have split our grism observations into 5 visits of 2 orbits each. Each visit is separated in ORIENT by 8-10 deg.

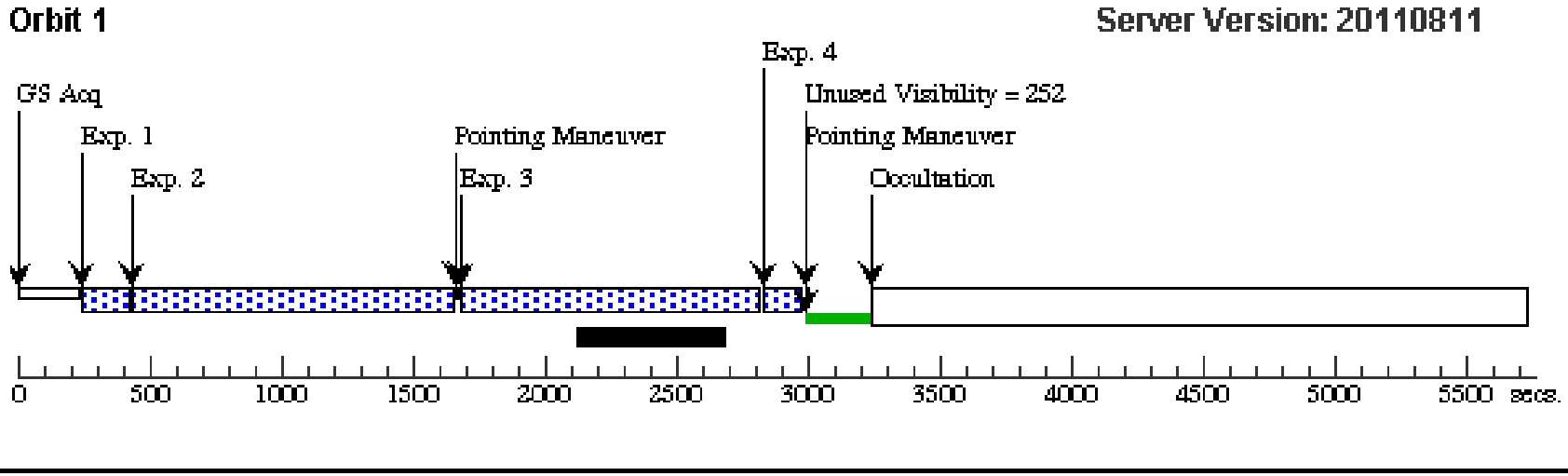
Fixed Targets

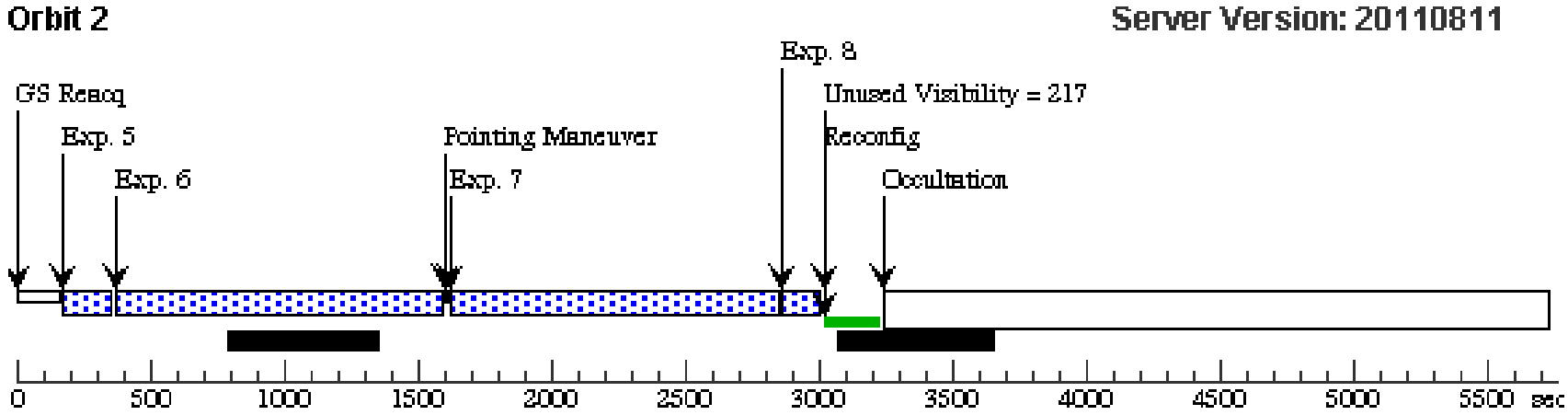
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	IRC0218A-CENTER-G102 Alt Name1: CLG0218.3-0510	RA: 02 18 19.7500 (34.5822917d) Dec: -05 10 15.00 (-5.17083d) Equinox: J2000		V=24 Redshift z=1.62, J(AB)=21-26	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	NSAMP=7; SAMP-SEQ=SPARS25	POS TARG 0.0,null; GS ACQ SCENARIO SINGLE	Sequence 1-4 Non-Int in Visit 01	*[==>]*	***[1]***
2	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG 0.00,null	Sequence 1-4 Non-Int in Visit 01	*[==>]*	***[1]***
3	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=12; SAMP-SEQ=SPARS100	POS TARG 0.542,0.182	Sequence 1-4 Non-Int in Visit 01	*[==>]*	***[1]***
4	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	SAMP-SEQ=SPARS25; NSAMP=6	POS TARG 0.542,0.182	Sequence 1-4 Non-Int in Visit 01	*[==>]*	***[1]***
5	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	NSAMP=7; SAMP-SEQ=SPARS25	POS TARG 0.339,0.485	Sequence 5-8 Non-Int in Visit 01	*[==>]*	***[2]***
6	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG 0.339,0.485	Sequence 5-8 Non-Int in Visit 01	*[==>]*	***[2]***
7	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG -0.203,0.303	Sequence 5-8 Non-Int in Visit 01	*[==>]*	***[2]***
8	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	SAMP-SEQ=SPARS25; NSAMP=6	POS TARG -0.203,0.303	Sequence 5-8 Non-Int in Visit 01	*[==>]*	***[2]***

Orbit Structure





Visit

Proposal 12590, Visit 02, implementation Thu Oct 13 01:43:35 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: ORIENT 59D TO 60 D; AFTER 01 BY 10 D TO 100 D

Comments: We were unable to achieve two suitable guide stars for high-priority galaxies, such that they would lie on the WFC3 detector and have the light dispersed from the grism falling on the detector. We are using a single guide star for all grism observations. This star allows us to use the optimal pointing and gives a range of U3=48-90 deg. We have split our grism observations into 5 visits of 2 orbits each. Each visit is separated in ORIENT by 8-10 deg.

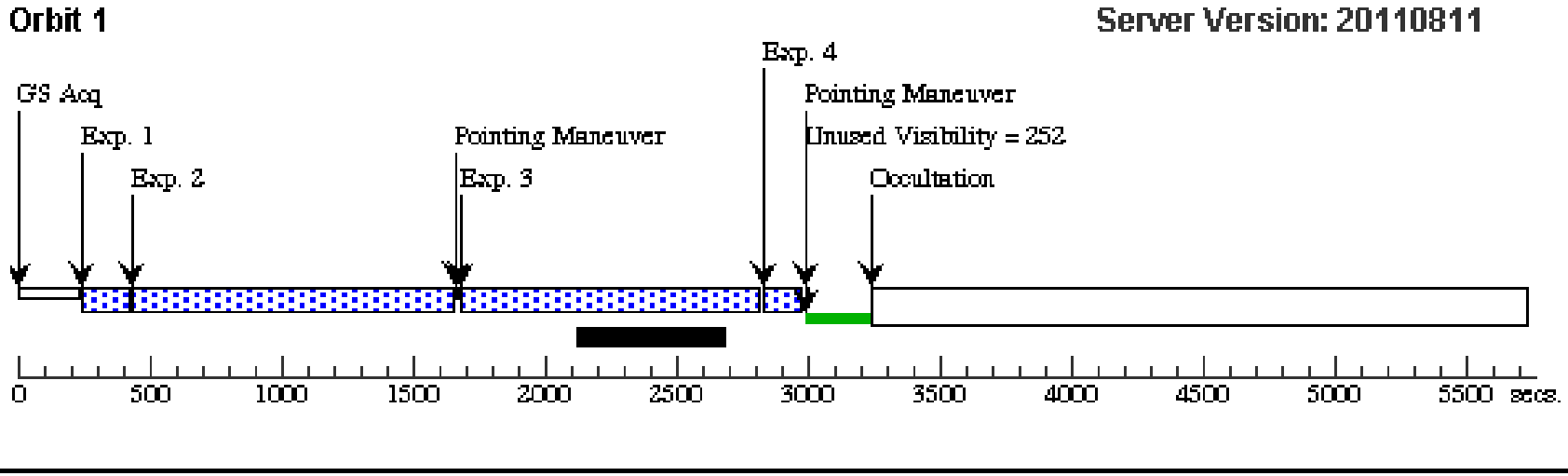
Fixed Targets

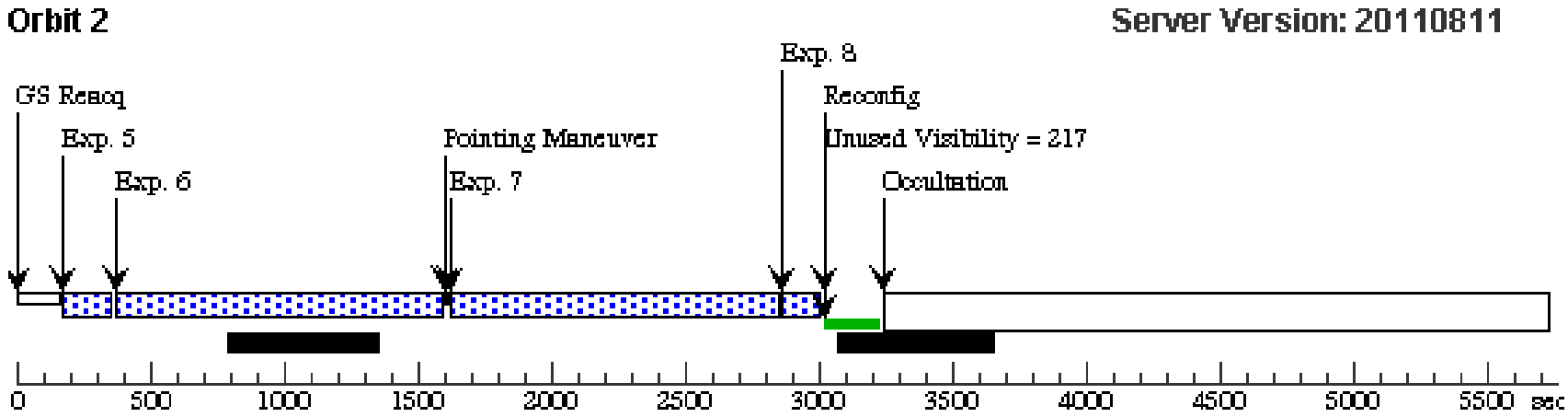
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	IRC0218A-CENTER-G102 Alt Name1: CLG0218.3-0510	RA: 02 18 19.7500 (34.5822917d) Dec: -05 10 15.00 (-5.17083d) Equinox: J2000		V=24 Redshift z=1.62, J(AB)=21-26	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	NSAMP=7; SAMP-SEQ=SPARS25	POS TARG 0.0,null; GS ACQ SCENARIO SINGLE	Sequence 1-4 Non-Int in Visit 02	*[==>]*	***[1]***
2	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG 0.00,null	Sequence 1-4 Non-Int in Visit 02	*[==>]*	***[1]***
3	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=12; SAMP-SEQ=SPARS100	POS TARG 0.542,0.182	Sequence 1-4 Non-Int in Visit 02	*[==>]*	***[1]***
4	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	SAMP-SEQ=SPARS25; NSAMP=6	POS TARG 0.542,0.182	Sequence 1-4 Non-Int in Visit 02	*[==>]*	***[1]***
5	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	NSAMP=7; SAMP-SEQ=SPARS25	POS TARG 0.339,0.485	Sequence 5-8 Non-Int in Visit 02	*[==>]*	***[2]***
6	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG 0.339,0.485	Sequence 5-8 Non-Int in Visit 02	*[==>]*	***[2]***
7	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG -0.203,0.303	Sequence 5-8 Non-Int in Visit 02	*[==>]*	***[2]***
8	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	SAMP-SEQ=SPARS25; NSAMP=6	POS TARG -0.203,0.303	Sequence 5-8 Non-Int in Visit 02	*[==>]*	***[2]***

Orbit Structure





Visit

Proposal 12590, Visit 03, implementation Thu Oct 13 01:43:36 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: ORIENT 69D TO 70 D; AFTER 01 BY 10 D TO 100 D

Comments: We were unable to achieve two suitable guide stars for high-priority galaxies, such that they would lie on the WFC3 detector and have the light dispersed from the grism falling on the detector. We are using a single guide star for all grism observations. This star allows us to use the optimal pointing and gives a range of U3=48-90 deg. We have split our grism observations into 5 visits of 2 orbits each. Each visit is separated in ORIENT by 8-10 deg.

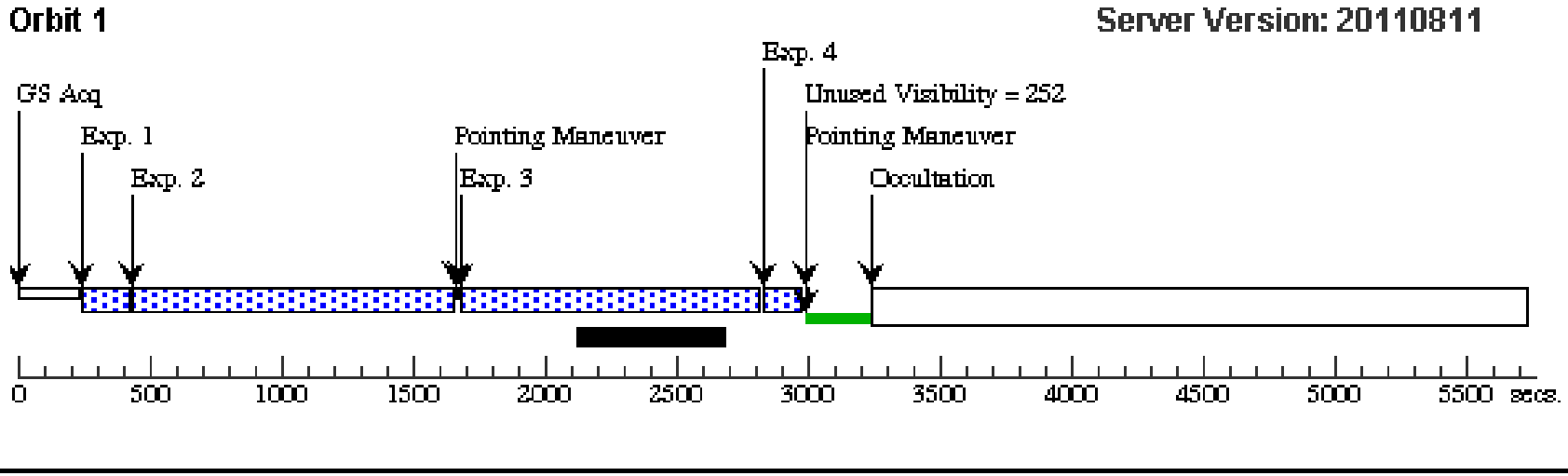
Fixed Targets

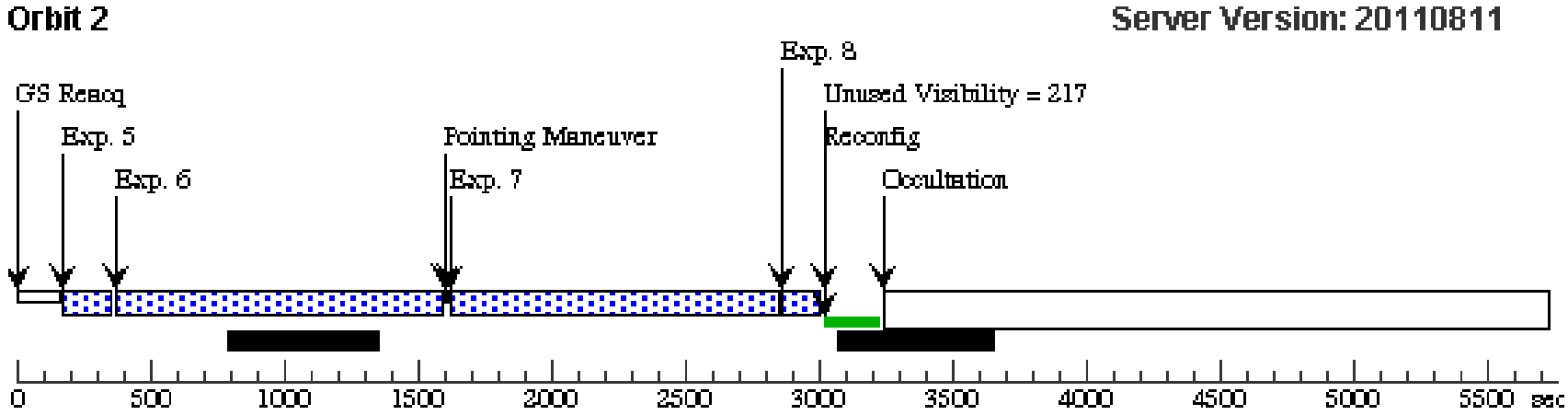
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	IRC0218A-CENTER-G102 Alt Name1: CLG0218.3-0510	RA: 02 18 19.7500 (34.5822917d) Dec: -05 10 15.00 (-5.17083d) Equinox: J2000		V=24 Redshift z=1.62, J(AB)=21-26	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	NSAMP=7; SAMP-SEQ=SPARS25	POS TARG 0.0,null; GS ACQ SCENARIO SINGLE	Sequence 1-4 Non-Int in Visit 03	*[==>]*	***[1]***
2	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG 0.00,null	Sequence 1-4 Non-Int in Visit 03	*[==>]*	***[1]***
3	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=12; SAMP-SEQ=SPARS100	POS TARG 0.542,0.182	Sequence 1-4 Non-Int in Visit 03	*[==>]*	***[1]***
4	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	SAMP-SEQ=SPARS25; NSAMP=6	POS TARG 0.542,0.182	Sequence 1-4 Non-Int in Visit 03	*[==>]*	***[1]***
5	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	NSAMP=7; SAMP-SEQ=SPARS25	POS TARG 0.339,0.485	Sequence 5-8 Non-Int in Visit 03	*[==>]*	***[2]***
6	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG 0.339,0.485	Sequence 5-8 Non-Int in Visit 03	*[==>]*	***[2]***
7	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG -0.203,0.303	Sequence 5-8 Non-Int in Visit 03	*[==>]*	***[2]***
8	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	SAMP-SEQ=SPARS25; NSAMP=6	POS TARG -0.203,0.303	Sequence 5-8 Non-Int in Visit 03	*[==>]*	***[2]***

Orbit Structure





Visit

Proposal 12590, Visit 04, implementation Thu Oct 13 01:43:37 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: ORIENT 79D TO 80 D; AFTER 01 BY 10 D TO 100 D

Comments: We were unable to achieve two suitable guide stars for high-priority galaxies, such that they would lie on the WFC3 detector and have the light dispersed from the grism falling on the detector. We are using a single guide star for all grism observations. This star allows us to use the optimal pointing and gives a range of U3=48-90 deg. We have split our grism observations into 5 visits of 2 orbits each. Each visit is separated in ORIENT by 8-10 deg.

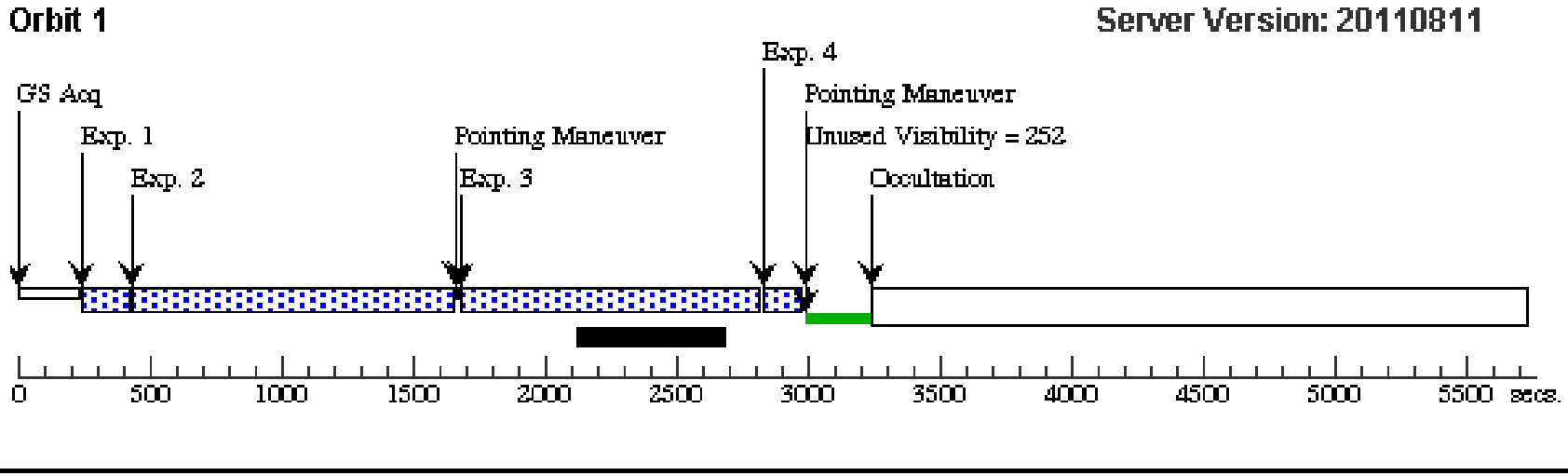
Fixed Targets

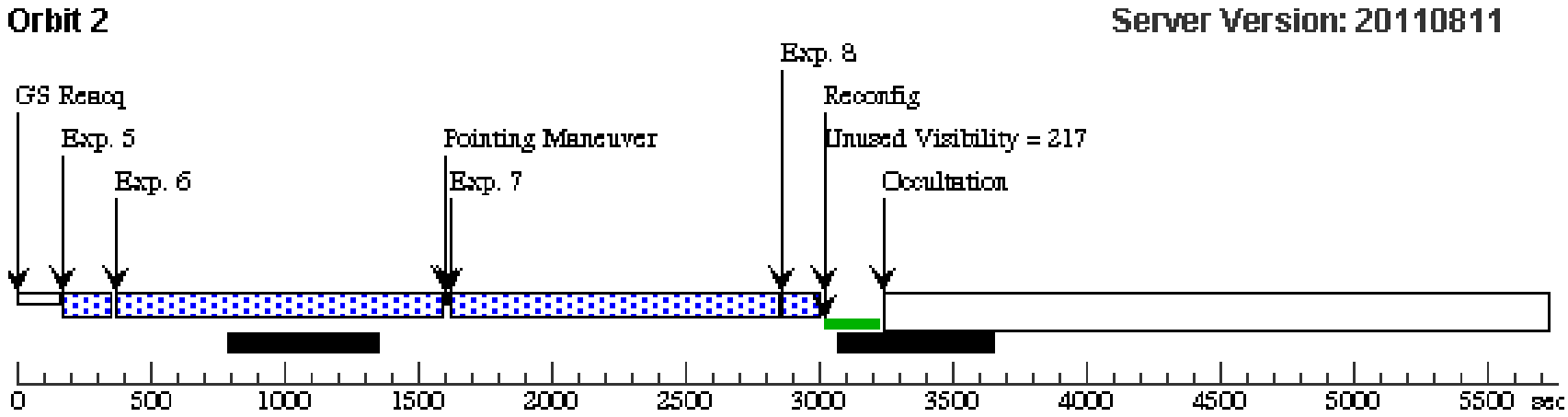
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	IRC0218A-CENTER-G102 Alt Name1: CLG0218.3-0510	RA: 02 18 19.7500 (34.5822917d) Dec: -05 10 15.00 (-5.17083d) Equinox: J2000		V=24 Redshift z=1.62, J(AB)=21-26	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	NSAMP=7; SAMP-SEQ=SPARS25	POS TARG 0.0,null; GS ACQ SCENARIO SINGLE	Sequence 1-4 Non-Int in Visit 04	*[==>]*	***[1]***
2	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG 0.00,null	Sequence 1-4 Non-Int in Visit 04	*[==>]*	***[1]***
3	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=12; SAMP-SEQ=SPARS100	POS TARG 0.542,0.182	Sequence 1-4 Non-Int in Visit 04	*[==>]*	***[1]***
4	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	SAMP-SEQ=SPARS25; NSAMP=6	POS TARG 0.542,0.182	Sequence 1-4 Non-Int in Visit 04	*[==>]*	***[1]***
5	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	NSAMP=7; SAMP-SEQ=SPARS25	POS TARG 0.339,0.485	Sequence 5-8 Non-Int in Visit 04	*[==>]*	***[2]***
6	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG 0.339,0.485	Sequence 5-8 Non-Int in Visit 04	*[==>]*	***[2]***
7	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG -0.203,0.303	Sequence 5-8 Non-Int in Visit 04	*[==>]*	***[2]***
8	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	SAMP-SEQ=SPARS25; NSAMP=6	POS TARG -0.203,0.303	Sequence 5-8 Non-Int in Visit 04	*[==>]*	***[2]***

Orbit Structure





Visit

Proposal 12590, Visit 05, implementation Thu Oct 13 01:43:39 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: ORIENT 89D TO 90 D; AFTER 01 BY 10 D TO 100 D

Comments: We were unable to achieve two suitable guide stars for high-priority galaxies, such that they would lie on the WFC3 detector and have the light dispersed from the grism falling on the detector. We are using a single guide star for all grism observations. This star allows us to use the optimal pointing and gives a range of U3=48-90 deg. We have split our grism observations into 5 visits of 2 orbits each. Each visit is separated in ORIENT by 8-10 deg.

Fixed Targets

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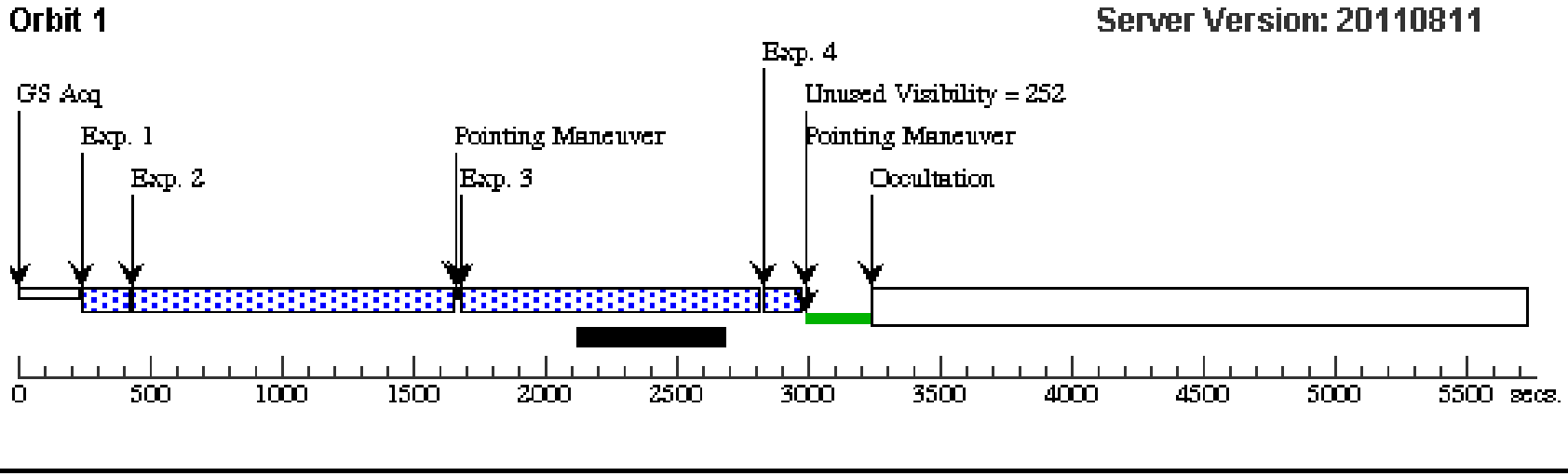
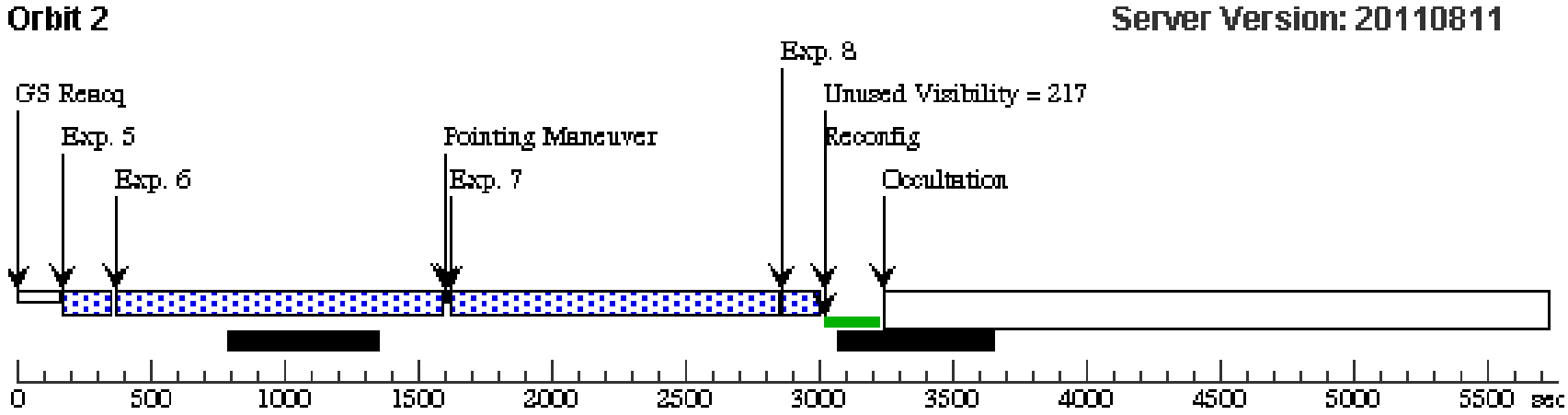
(1)	IRC0218A-CENTER-G102 Alt Name1: CLG0218.3-0510	RA: 02 18 19.7500 (34.5822917d) Dec: -05 10 15.00 (-5.17083d) Equinox: J2000		V=24 Redshift z=1.62, J(AB)=21-26	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	NSAMP=7; SAMP-SEQ=SPARS25	POS TARG 0.0,null; GS ACQ SCENARIO SINGLE	Sequence 1-4 Non-Int in Visit 05	*[==>]*	***[1]***
2	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG 0.00,null	Sequence 1-4 Non-Int in Visit 05	*[==>]*	***[1]***
3	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=12; SAMP-SEQ=SPARS100	POS TARG 0.542,0.182	Sequence 1-4 Non-Int in Visit 05	*[==>]*	***[1]***
4	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	SAMP-SEQ=SPARS25; NSAMP=6	POS TARG 0.542,0.182	Sequence 1-4 Non-Int in Visit 05	*[==>]*	***[1]***
5	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	NSAMP=7; SAMP-SEQ=SPARS25	POS TARG 0.339,0.485	Sequence 5-8 Non-Int in Visit 05	*[==>]*	***[2]***
6	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG 0.339,0.485	Sequence 5-8 Non-Int in Visit 05	*[==>]*	***[2]***
7	Grism G102	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	G102	NSAMP=13; SAMP-SEQ=SPARS100	POS TARG -0.203,0.303	Sequence 5-8 Non-Int in Visit 05	*[==>]*	***[2]***
8	Direct F105W	(1) IRC0218A-CENTER-G102	WFC3/IR, MULTIACCUM, GRISM1024	F105W	SAMP-SEQ=SPARS25; NSAMP=6	POS TARG -0.203,0.303	Sequence 5-8 Non-Int in Visit 05	*[==>]*	***[2]***

Orbit Structure





Visit

Proposal 12590, Visit 06, implementation Thu Oct 13 01:43:39 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: ORIENT 35D TO 55 D; ORIENT 125D TO 145 D; ORIENT 215D TO 235 D; ORIENT 305D TO 325 D; ORIENT 6.0D TO 11.0 D

Patterns

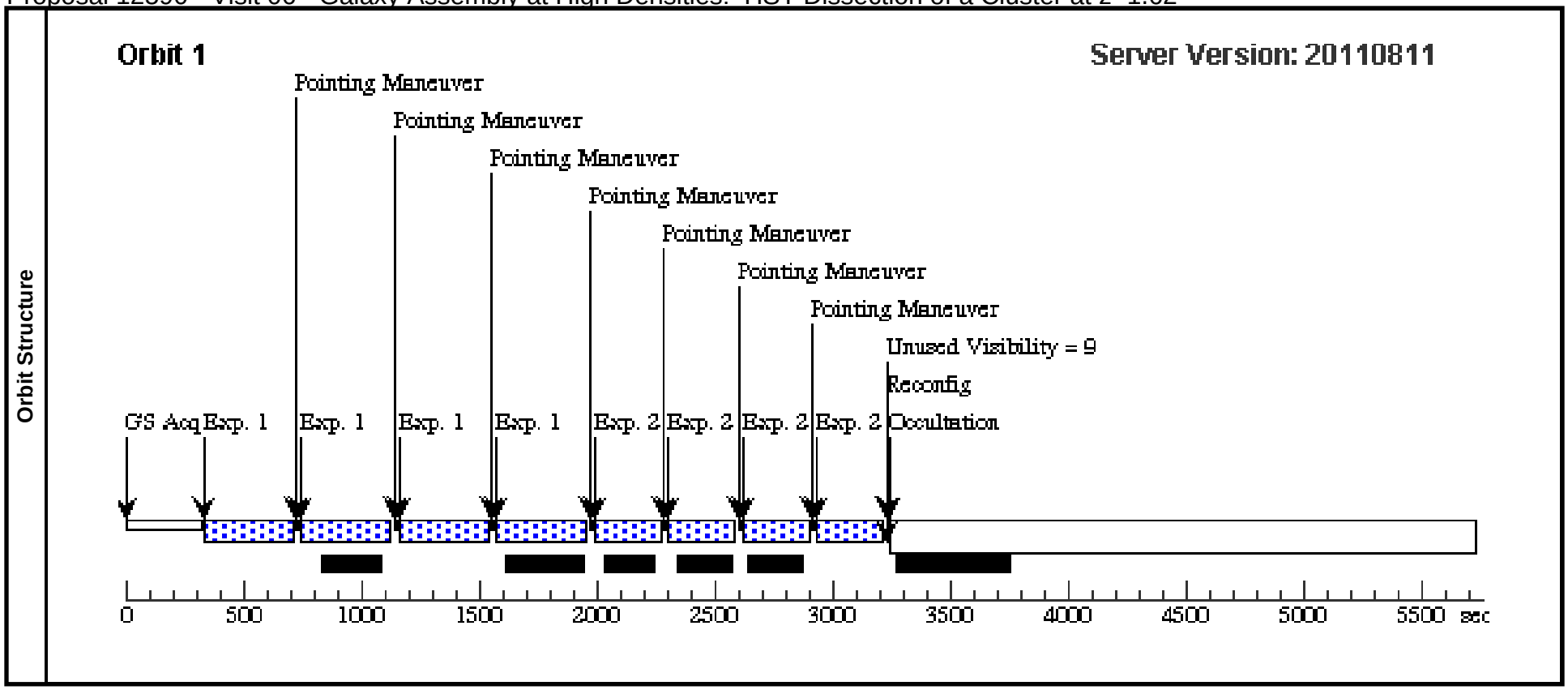
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(1), (2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	IRC0218A-F105W Alt Name1: CLG0218.3-0510	RA: 02 18 18.5000 (34.5770833d) Dec: -05 10 19.00 (-5.17194d) Equinox: J2000		V=24 Redshift z=1.62, J(AB)=21-26	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	F105W	(3) IRC0218A-F105W	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=8; SAMP-SEQ=SPARS50		Pattern 1, Exps 1-1 in Visit 06 (1)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2	F105W	(3) IRC0218A-F105W	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=11; SAMP-SEQ=SPARS25		Pattern 1, Exps 2-2 in Visit 06 (1)	*[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20110811
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 9
Reconfig
GS Acq
Exp. 1
Exp. 1
Exp. 1
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12590, Visit 07, implementation Thu Oct 13 01:43:40 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Comments: We have manually entered the "Actual Duration" into each ACS exposure to fill in the orbit.

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(4)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.28 Angle Between Sides= Center Pattern=false	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

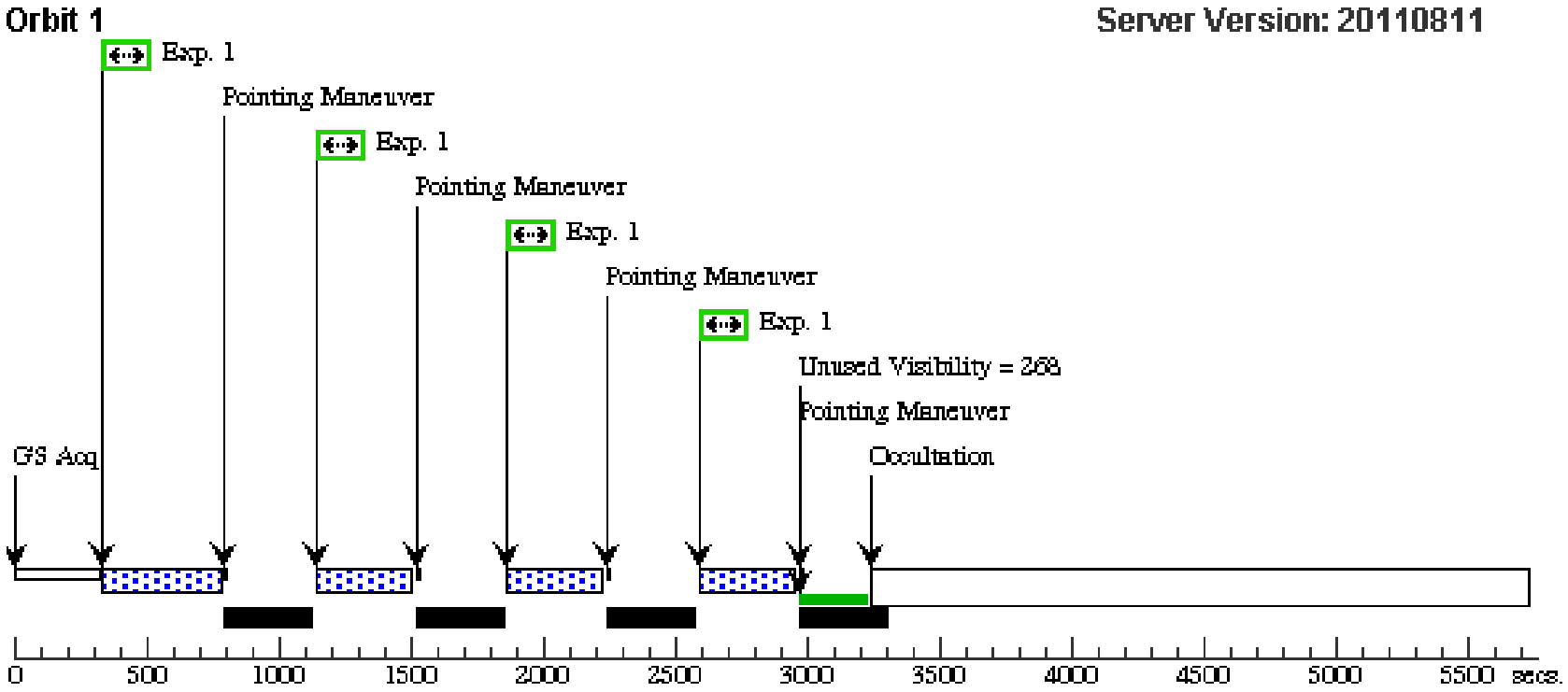
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	IRC0218A-ACS Alt Name1: CLG0218.3-0510	RA: 02 18 19.7500 (34.5822917d) Dec: -05 09 28.00 (-5.15778d) Equinox: J2000		V=24 Redshift z=1.62, J(AB)=21-26	Reference Frame: ICRS

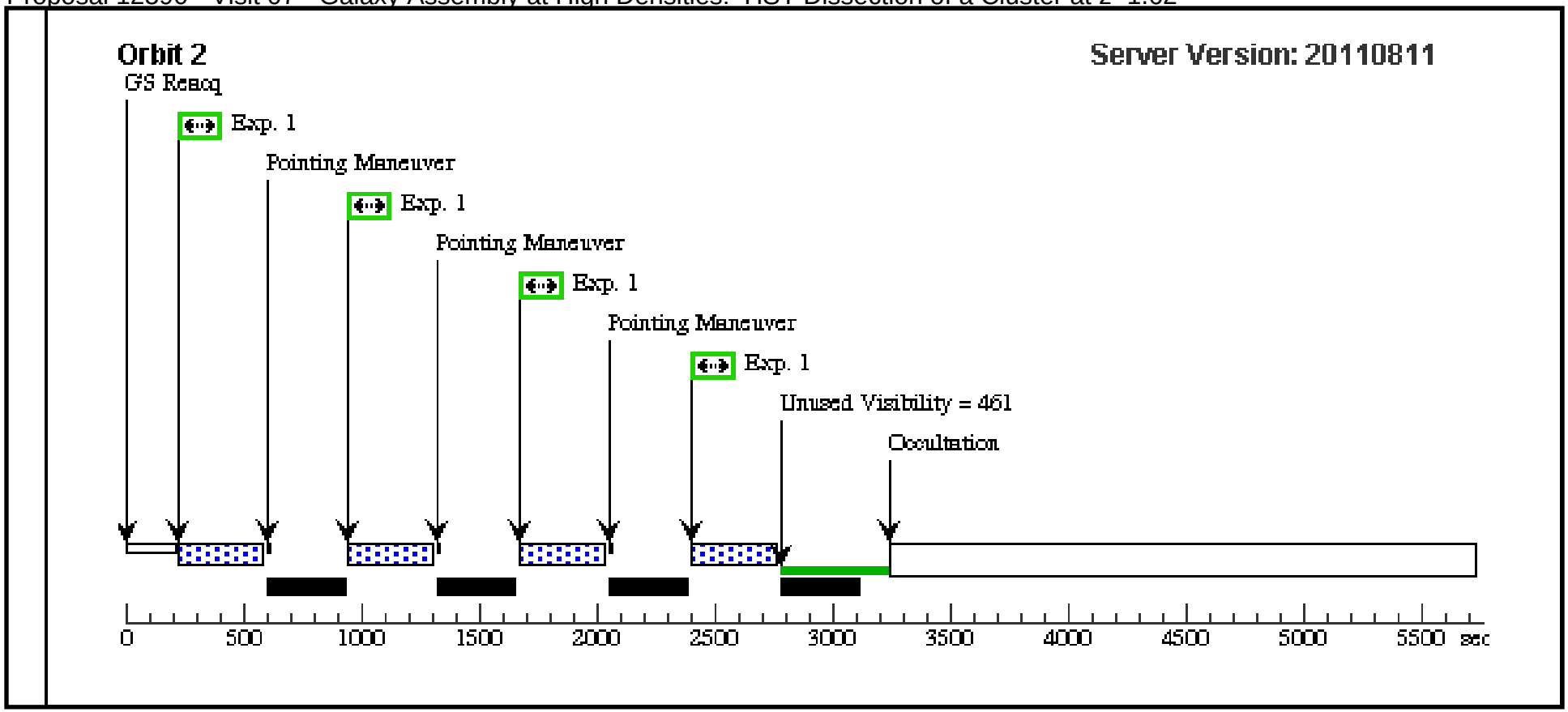
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACSF814W	(4) IRC0218A-ACS	ACS/WFC, ACCUM, WFC	F814W	CR-SPLIT=NO; GAIN=2.0		Pattern 4, Exps 1-1 in Visit 07 (4)	240 Secs	
								[==>(Pattern 1,1)] *[==>(Pattern 1,2)]* *[==>(Pattern 1,3)]* *[==>(Pattern 1,4)]*	***[1]***
								[==>(Pattern 2,1)] *[==>(Pattern 2,2)]* *[==>(Pattern 2,3)]* *[==>(Pattern 2,4)]*	***[2]***

Comments: We have used the "auto-adjust" to fill out the orbit. We would like to use as much exposure time as possible.

Orbit Structure




Orbit 2
Server Version: 20110811
GS Reacq
Exp. 1
Pointing Maneuver
Exp. 1
Pointing Maneuver
Exp. 1
Pointing Maneuver
Exp. 1
Unused Visibility = 461
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12590, Visit 08, implementation Thu Oct 13 01:43:41 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: SAME ORIENT AS 07

Comments: We have manually entered the "Actual Duration" into each ACS exposure to fill in the orbit.

Patterns

#	Primary Pattern		Secondary Pattern		Exposures
(4)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.28 Angle Between Sides= Center Pattern=false	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

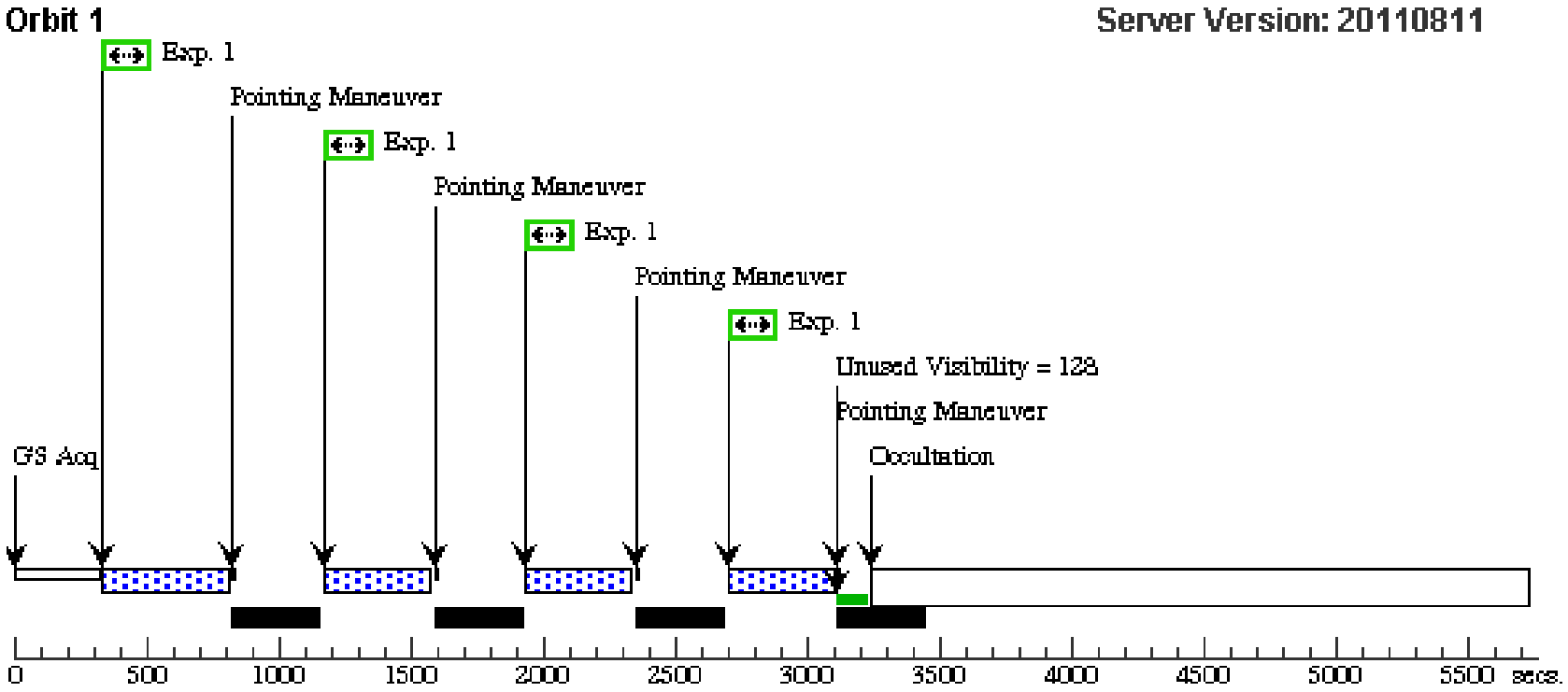
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	IRC0218A-ACS Alt Name1: CLG0218.3-0510	RA: 02 18 19.7500 (34.5822917d) Dec: -05 09 28.00 (-5.15778d) Equinox: J2000		V=24 Redshift z=1.62, J(AB)=21-26	Reference Frame: ICRS

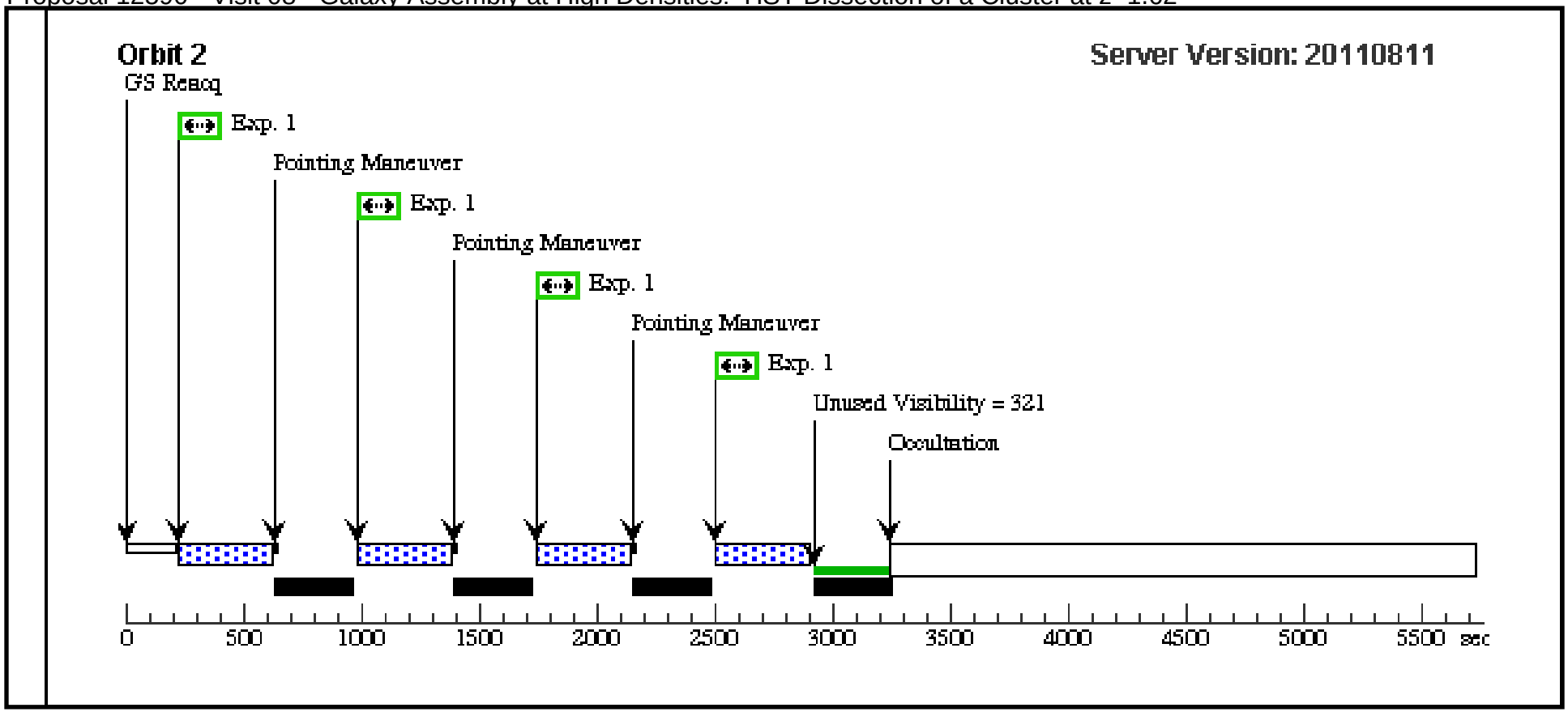
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACSF475W	(4) IRC0218A-ACS	ACS/WFC, ACCUM, WFC	F475W	CR-SPLIT=NO; GAIN=2.0		Pattern 4, Exps 1-1 in Visit 08 (4)	275 Secs	
								[==>(Pattern 1,1)] *[==>(Pattern 1,2)]* *[==>(Pattern 1,3)]* *[==>(Pattern 1,4)]*	***[1]***
								[==>(Pattern 2,1)] *[==>(Pattern 2,2)]* *[==>(Pattern 2,3)]* *[==>(Pattern 2,4)]*	***[2]***

Comments: We have used the "auto-adjust" to fill out the orbit. We would like to use as much exposure time as possible.

Orbit Structure




Orbit 2
Server Version: 20110811
GS Reacq
Exp. 1
Pointing Maneuver
Exp. 1
Pointing Maneuver
Exp. 1
Pointing Maneuver
Exp. 1
Unused Visibility = 321
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12590, Visit 09, implementation Thu Oct 13 01:43:42 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: ORIENT 35D TO 43.3 D

Comments: We have forced the ORIENT of this visit to match the existing CANDELS data. This places the new pointing adjacent to the existing WFC3 imaging with minimal overlap.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	IRC0218A-WFC3-OFFSET	RA: 02 18 25.5000 (34.6062500d) Dec: -05 10 8.00 (-5.16889d) Equinox: J2000		V=24 Redshift z=1.62, J(AB)=21-26	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(2) IRC0218A-WFC3-OFFSET	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=12; SAMP-SEQ=SPARS50	POS TARG -0.608,+0.244	Sequence 1-4 Non-Int in Visit 09	*[==>]*	***[1]***
2		(2) IRC0218A-WFC3-OFFSET	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=13; SAMP-SEQ=SPARS50	POS TARG +0.273, +0.302	Sequence 1-4 Non-Int in Visit 09	*[==>]*	***[1]***
3		(2) IRC0218A-WFC3-OFFSET	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=8; SAMP-SEQ=SPARS100	POS TARG -0.340,-0.301	Sequence 1-4 Non-Int in Visit 09	*[==>]*	***[1]***
4		(2) IRC0218A-WFC3-OFFSET	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=9; SAMP-SEQ=SPARS100	POS TARG +0.540,-0.243	Sequence 1-4 Non-Int in Visit 09	*[==>]*	***[1]***
5		(2) IRC0218A-WFC3-OFFSET	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=13; SAMP-SEQ=SPARS50	POS TARG -3.446,-2.565	Sequence 5-8 Non-Int in Visit 09	*[==>]*	***[2]***
6		(2) IRC0218A-WFC3-OFFSET	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=14; SAMP-SEQ=SPARS50	POS TARG -2.586,-2.528	Sequence 5-8 Non-Int in Visit 09	*[==>]*	***[2]***
7		(2) IRC0218A-WFC3-OFFSET	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=8; SAMP-SEQ=SPARS100	POS TARG -3.178,-2.298	Sequence 5-8 Non-Int in Visit 09	*[==>]*	***[2]***
8		(2) IRC0218A-WFC3-OFFSET	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=9; SAMP-SEQ=SPARS100	POS TARG -3.131,-3.073	Sequence 5-8 Non-Int in Visit 09	*[==>]*	***[2]***

Orbit Structure