12755 - Chandra Observations of the Brightest Sunyaev-Zeldovich Effect Cluster

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) ACTJ0102-4915-NW	ACS/WFC	3	11-Oct-2011 21:04:10.0	yes
02	(2) ACTJ0102-4915-SE	ACS/WFC	3	11-Oct-2011 21:04:20.0	yes

6 Total Orbits Used

ABSTRACT

We propose deep Chandra observations of ACT-CL J0102-4915, the brightest Sunyaev-Zeldovich effect cluster discovered by the Atacama Cosmology Telescope and South Pole Telescope surveys. These surveys covered approximately 3000 square degrees and are essentially complete to high redshift. Our recent Chandra and VLT optical data reveal ACL-CL J0102-4915 to be undergoing a major merger. It is likely a high redshift (z=0.870) counterpart to the famous ‘‘bullet’’ cluster. New Chandra data will determine the properties of the merger shock and the HST/ACS data will provide a weak lensing mass map.

OBSERVING DESCRIPTION

The target is a rich cluster of galaxies at a redshift of 0.87. The observation goals are to obtain a weak lensing mass measurement and to map the dark matter distribution for comparison with Chandra X-ray data. The cluster is clearly undergoing a major merger and there are two main galaxy distributions separated by 1.2 arcminutes.

We will perform a 2 point mosaic in order to cover both galaxy distributions and most of the extent of the X-ray emission. Each pointing is approximately centered on a peak in the galaxy distribution which also allows for a significant region of overlap between the 2 pointings. As clearly stated in our proposal, the alignment of the two galaxy peaks requires us to restrict the orientation angle of the WFC/ACS pointings. The required values are 324 deg for the NW pointing and 322 deg for the SE pointing with an acceptable range of +/- 5 degrees. The given "Fixed Targets" coordinates were optimised for these roll angles.

At each point in the mosaic we use one orbit per filter (F625W, F773W, and F850LP). To ensure optimal overlap between these images for color segregation of the galaxies, we schedule each pointing as a separate visit consisting of 3 orbits.

We use a 4-point box dither pattern intended to perform 1/2 subpixel sampling and cover the chip gaps of ACS/WFC.

Visit

Proposal 12755, Visit 01, implementation Wed Oct 12 01:04:28 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 319D TO 329 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=5.943 Line Spacing=3.077	Coordinate Frame=POS-TARG Pattern Orientation=91.429 Angle Between Sides=166.993 Center Pattern=false		(1), (2), (3)

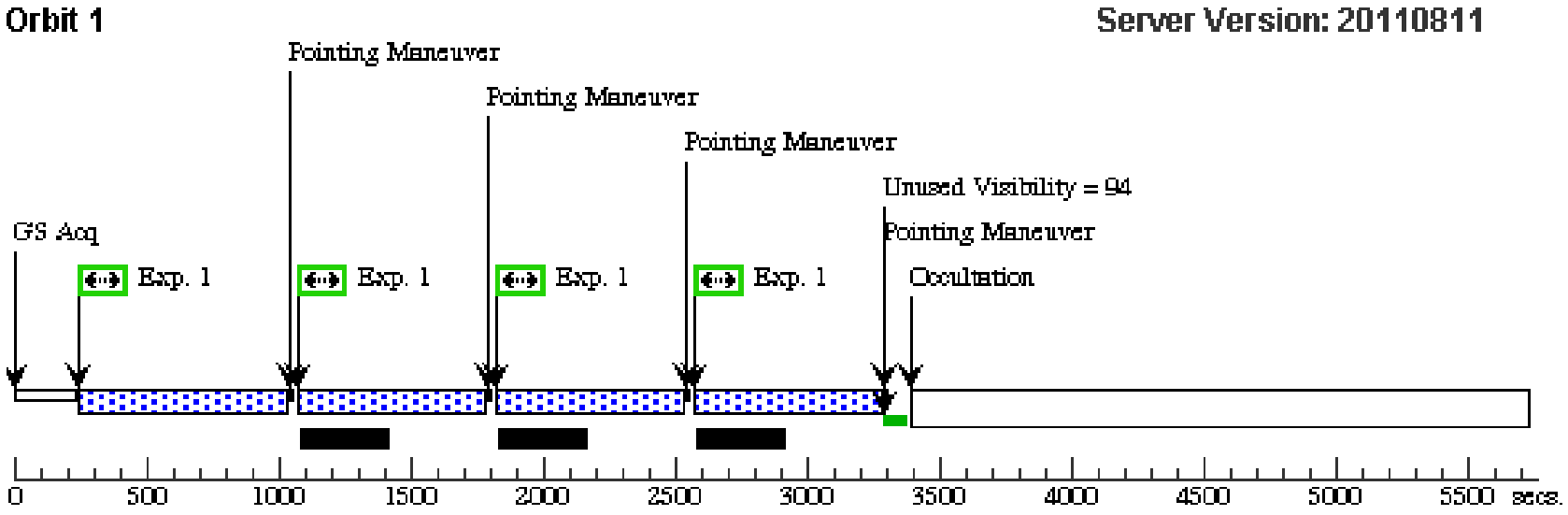
Fixed Targets

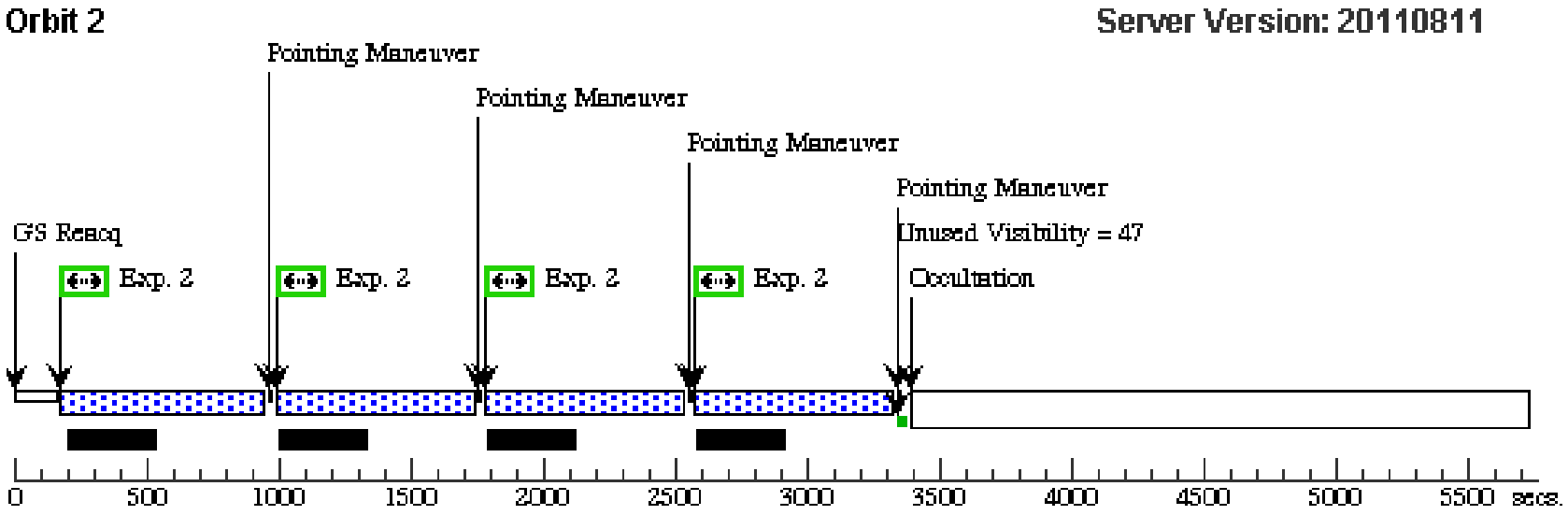
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	ACTJ0102-4915-NW	RA: 01 02 50.9000 (15.7120833d) Dec: -49 14 25.40 (-49.24039d) Equinox: J2000		V=26	Reference Frame: ICRS

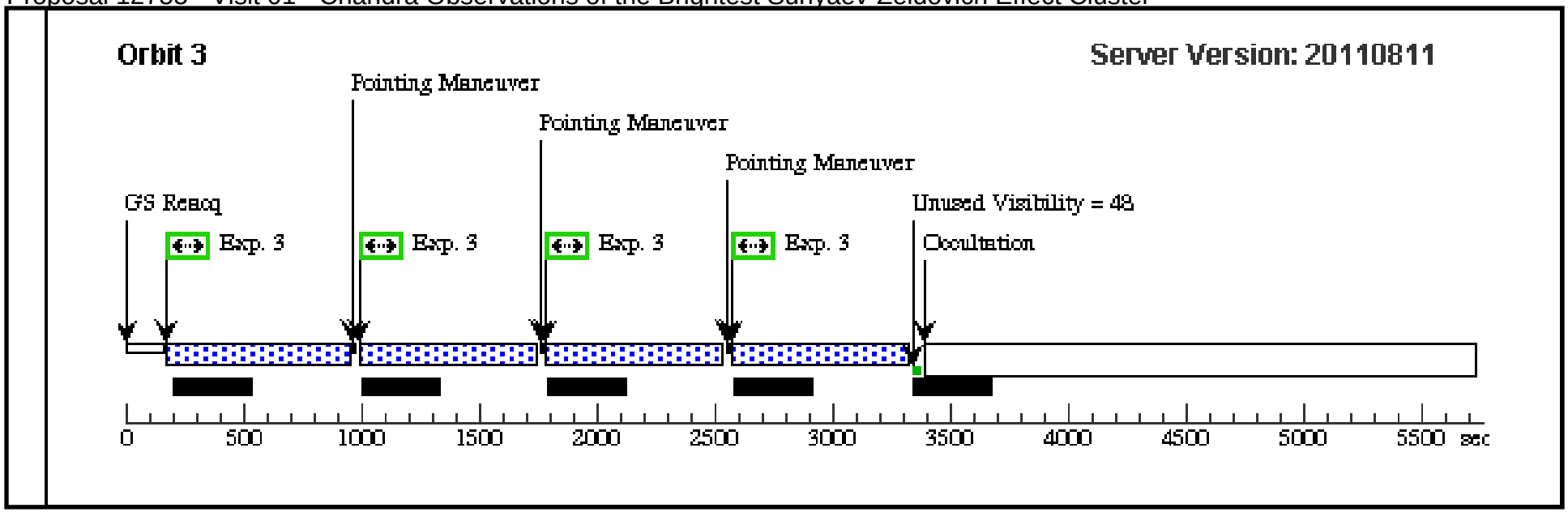
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) ACTJ0102-4915-NW	ACS/WFC, ACCUM, WFCENTER	F625W		GS ACQ SCENARIO SINGLE	Pattern 1, Exps 1-1 in Visit 01 (1)	586 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2		(1) ACTJ0102-4915-NW	ACS/WFC, ACCUM, WFCENTER	F850LP			Pattern 1, Exps 2-2 in Visit 01 (1)	629 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[2]***
3		(1) ACTJ0102-4915-NW	ACS/WFC, ACCUM, WFCENTER	F775W			Pattern 1, Exps 3-3 in Visit 01 (1)	628 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20110811
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
GS Reacq
Exp. 3
Exp. 3
Exp. 3
Exp. 3
Unused Visibility = 48
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12755, Visit 02, implementation Wed Oct 12 01:04:29 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: ORIENT 317D TO 327 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=5.943 Line Spacing=3.077	Coordinate Frame=POS-TARG Pattern Orientation=91.429 Angle Between Sides=166.993 Center Pattern=false		(1), (2), (3)

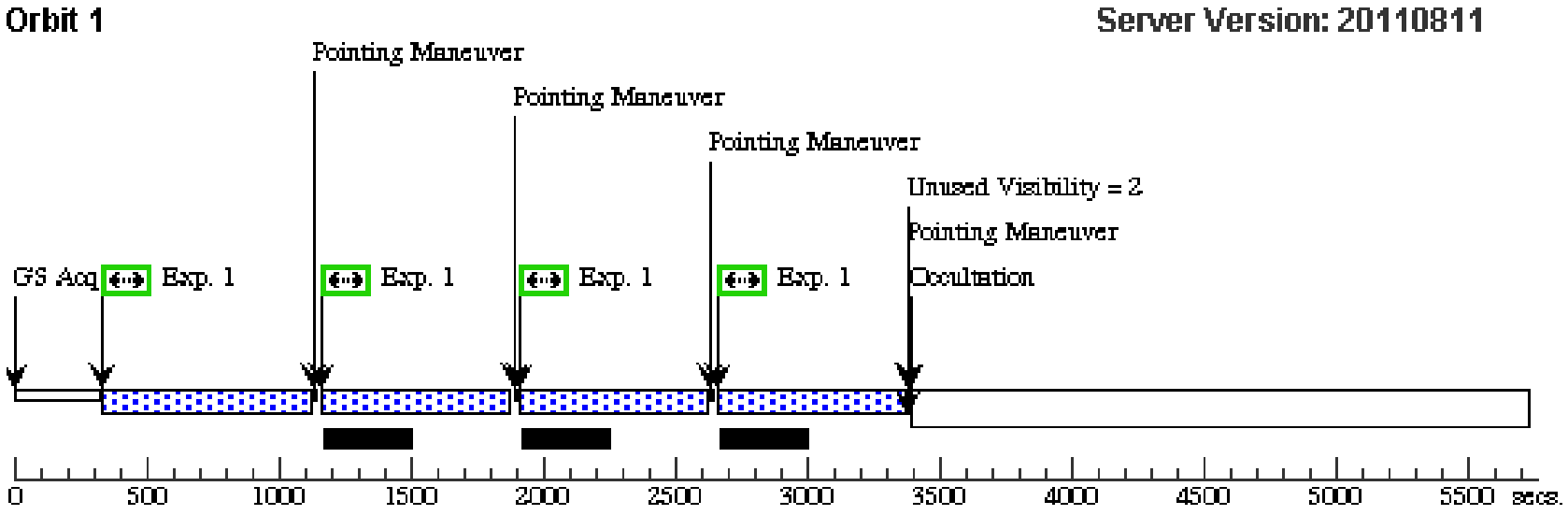
Fixed Targets

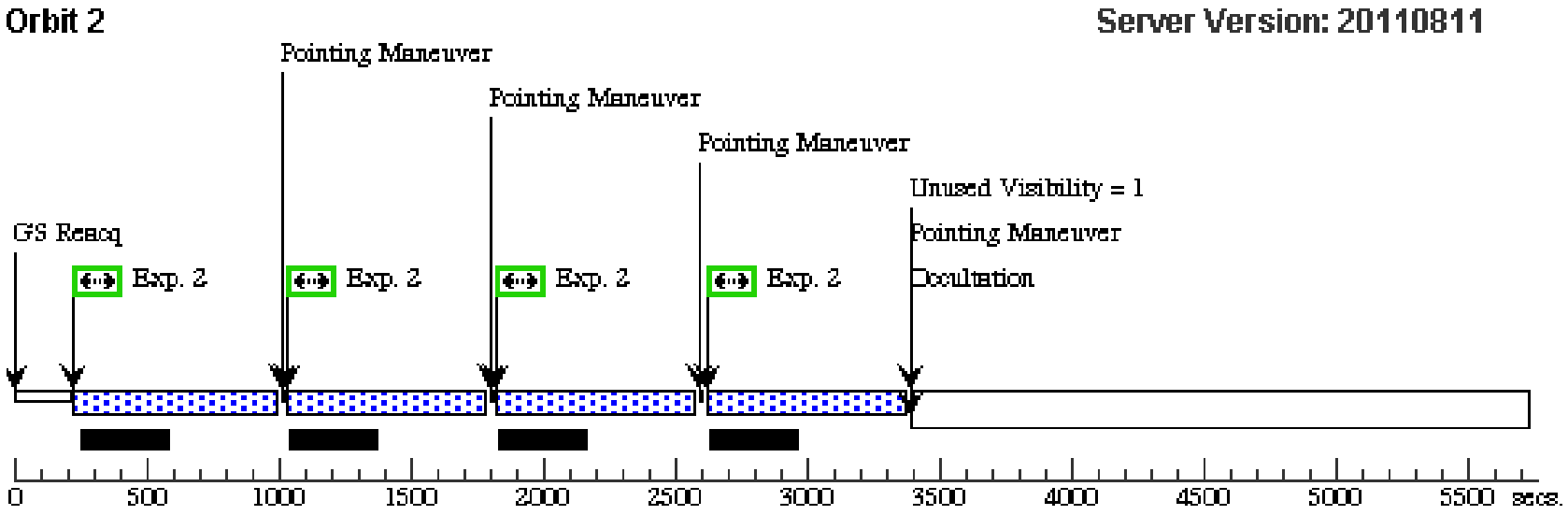
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	ACTJ0102-4915-SE	RA: 01 03 3.1100 (15.7629583d) Dec: -49 16 52.46 (-49.28124d) Equinox: J2000		V=26	Reference Frame: ICRS

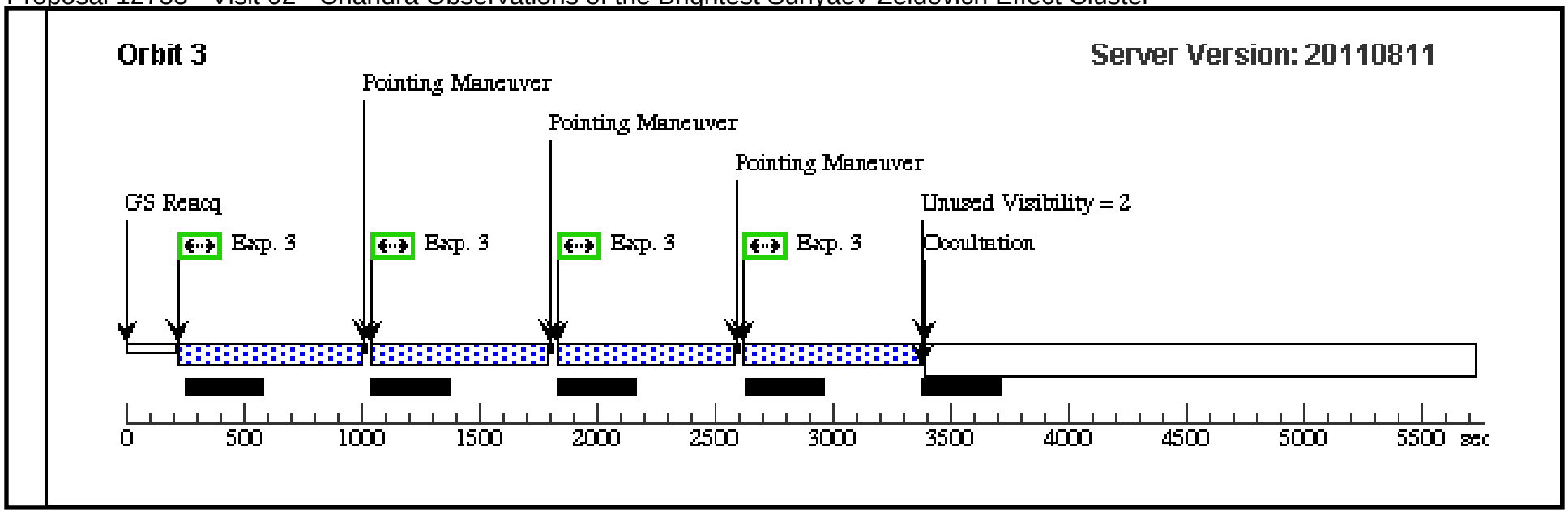
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(2) ACTJ0102-4915-SE	ACS/WFC, ACCUM, WFCENTER	F625W			Pattern 1, Exps 1-1 in Visit 02 (1)	586 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2		(2) ACTJ0102-4915-SE	ACS/WFC, ACCUM, WFCENTER	F850LP			Pattern 1, Exps 2-2 in Visit 02 (1)	629 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[2]***
3		(2) ACTJ0102-4915-SE	ACS/WFC, ACCUM, WFCENTER	F775W			Pattern 1, Exps 3-3 in Visit 02 (1)	628 Secs	
								[==>(Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20110811
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
GS Reacq
Exp. 3
Exp. 3
Exp. 3
Exp. 3
Unused Visibility = 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec