12377 - DLSCL J0916+2953: A New Transverse Cluster Merger

Cycle: 18, 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) DLSCL-J0916+2953-WEST	ACS/WFC WFC3/UVIS	3	29-Sep-2010 21:37:33.0	yes
02	(2) DLSCL-J0916+2953-SOUTH	ACS/WFC WFC3/UVIS	3	29-Sep-2010 21:37:48.0	yes

6 Total Orbits Used

ABSTRACT

Merging clusters of galaxies are beginning to provide constraints on fundamental physics, such as the dark matter self-interaction cross-section and the matter/antimatter ratio. We request joint Chandra and HST imaging to examine a merger at z=0.53 which we have identified optically and spectroscopically confirmed. Our optical data and weak lensing mass map clearly show three sub-clusters within the same redshift range, while our SZ data are consistent with an offset between the hot ICM and sub-clusters; Combined HST and Chandra imaging are needed to confirm this offset and provide accurate displacements between X-ray-emitting gas, galaxies, and mass which can constrain the physics of merging clusters. The requested observations will also facilitate a wide range of non-merger science.

OBSERVING DESCRIPTION

We will perform a coordinated parallel observation with ACS/WFC as the primary and WFC3/UVIS as the secondary. Our program consists of a modified two point ACS/WFC mosaic with three orbits per pointing (two with F814W and one with F606W) with simultaneous WFC3/UVIS exposures (two with F814W and one with F606W).

In order to place the WFC3/UVIS field-of-view as close to the third subcluster as possible without compromising the primary ACS observations of the two main subclusters we will require an orientation constraint of +/- 5 degrees for each pointing.

A three exposure per orbit program is required by buffer limitations in order to fully utilize of each orbit. For the F814W orbits we will use an ACS/WFC box dither pattern that performs a 1/2 subpixel sampling, covers the chip gaps of ACS/WFC and WFC3/UVIS, and performs a near 1/2 box subpixel sampling of the WFC3/UVIS chips; followed by a dither pattern that performs a 1/3 & 2/3 diagonal subpixel sampling of the WFC3/UVIS chip, covers the chip gaps of WFC3/UVIS and ACS/WFC, and is a near 1/3 & 2/3 diagonal subpixel sampling of the AFC/WFC chip. For the F606W orbits the dither pattern is designed to perform 1/3 & 2/3 ACS/WFC diagonal subpixel sampling, cover the chip gaps of ACS/WFC and WFC3/UVIS chips, and near 1/3 & 2/3 WFC3/UVIS diagonal subpixel sampling.

Due to the orientation constraints we have designed this observation to be done in two visits (one per target).

Visit

Proposal 12377, Visit 01 Thu Sep 30 01:37:54 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC, WFC3/UVIS

Special Requirements: ORIENT 220D TO 230 D

Comments: ACS/WFC & WFC3/UVIS parallel observations of DLSCL J0916+2953-West subcluster. The orient constraints are required to place the WFC3 FOV as close to the East subcluster as possible.

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)
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=2.746 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=277.936 Angle Between Sides= Center Pattern=false		(3-4)
(3)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=2.746 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=103.052 Angle Between Sides= Center Pattern=false		(5-6)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	DLSCL-J0916+2953-WEST	RA: 09 16 6.5000 (139.0270833d) Dec: +29 52 1.00 (29.86694d) Equinox: J2000	Redshift: 0.53	V=22	Reference Frame: ICRS

Comments: This pointing is centered on the location of the western subcluster of DLSCL J0916+2953.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) DLSCL-J0916+2953-WEST	ACS/WFC, ACCUM, WFCENTER	F814W			Pattern 1, Exps 1-2 (1) Prime + Parallel Group 1-2	800 Secs	
								[==>792.0 Secs (Pattern 1)] *[==>792.0 Secs (Pattern 2)]* *[==>792.0 Secs (Pattern 3)]*	***[1]***
								[==>857.0 Secs (Pattern 4)]	***[2]***
2		(1) DLSCL-J0916+2953-WEST	WFC3/UVIS, ACCUM, UVIS	F814W			Pattern 1, Exps 1-2 (1) Prime + Parallel Group 1-2	800 Secs	
								[==>852.0 Secs (Pattern 1)] *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
								[==>867.0 Secs (Pattern 4)]	***[2]***
3		(1) DLSCL-J0916+2953-WEST	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.379,-2.72	Pattern 2, Exps 3-4 (2) Prime + Parallel Group 3-4	800 Secs	
								[==>857.0 Secs (Pattern 1)] *[==>857.0 Secs (Pattern 2)]*	***[2]***
4		(1) DLSCL-J0916+2953-WEST	WFC3/UVIS, ACCUM, UVIS	F814W			Pattern 2, Exps 3-4 (2) Prime + Parallel Group 3-4	800 Secs	
								[==>867.0 Secs (Pattern 1)] *[==>867.0 Secs (Pattern 2)]*	***[2]***
5		(1) DLSCL-J0916+2953-WEST	ACS/WFC, ACCUM, WFCENTER	F606W			Pattern 3, Exps 5-6 (3) Prime + Parallel Group 5-6	800 Secs	
								[==>840.0 Secs (Pattern 1)] *[==>840.0 Secs (Pattern 2)]* *[==>840.0 Secs (Pattern 3)]*	***[3]***
6		(1) DLSCL-J0916+2953-WEST	WFC3/UVIS, ACCUM, UVIS	F606W			Pattern 3, Exps 5-6 (3) Prime + Parallel Group 5-6	800 Secs	
								[==>882.0 Secs (Pattern 1)] *[==>850.0 Secs (Pattern 2)]* *[==>850.0 Secs (Pattern 3)]*	***[3]***

Orbit Structure

Orbit 1

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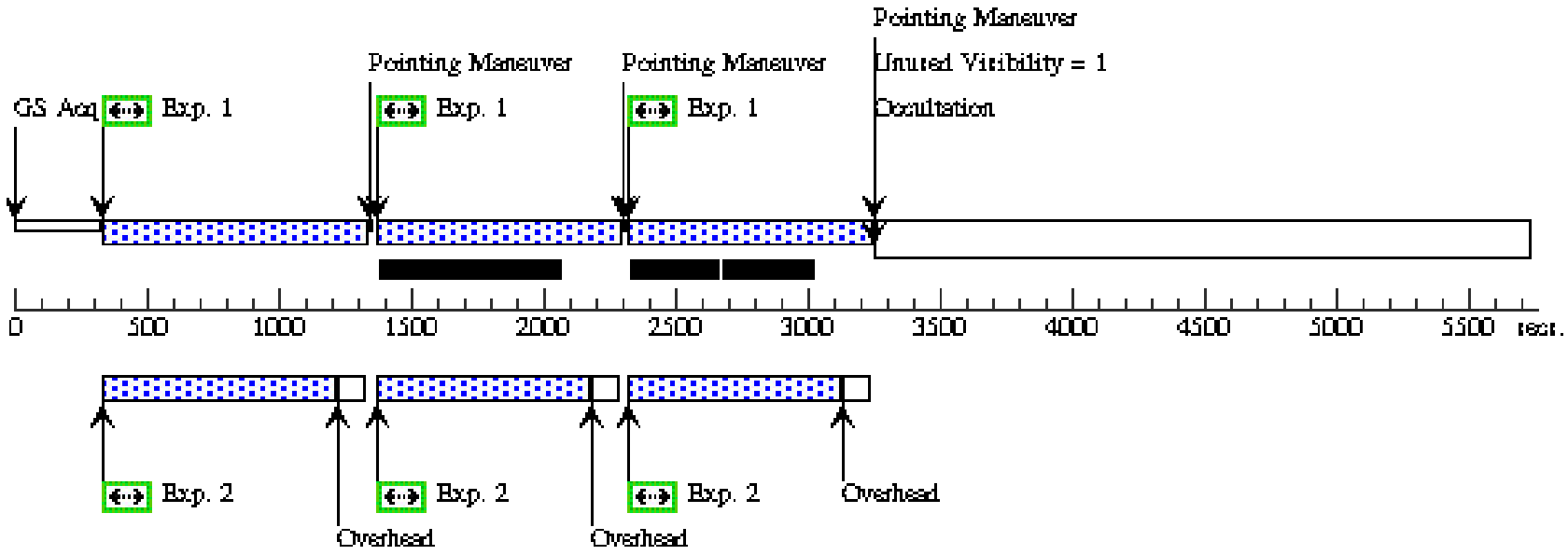
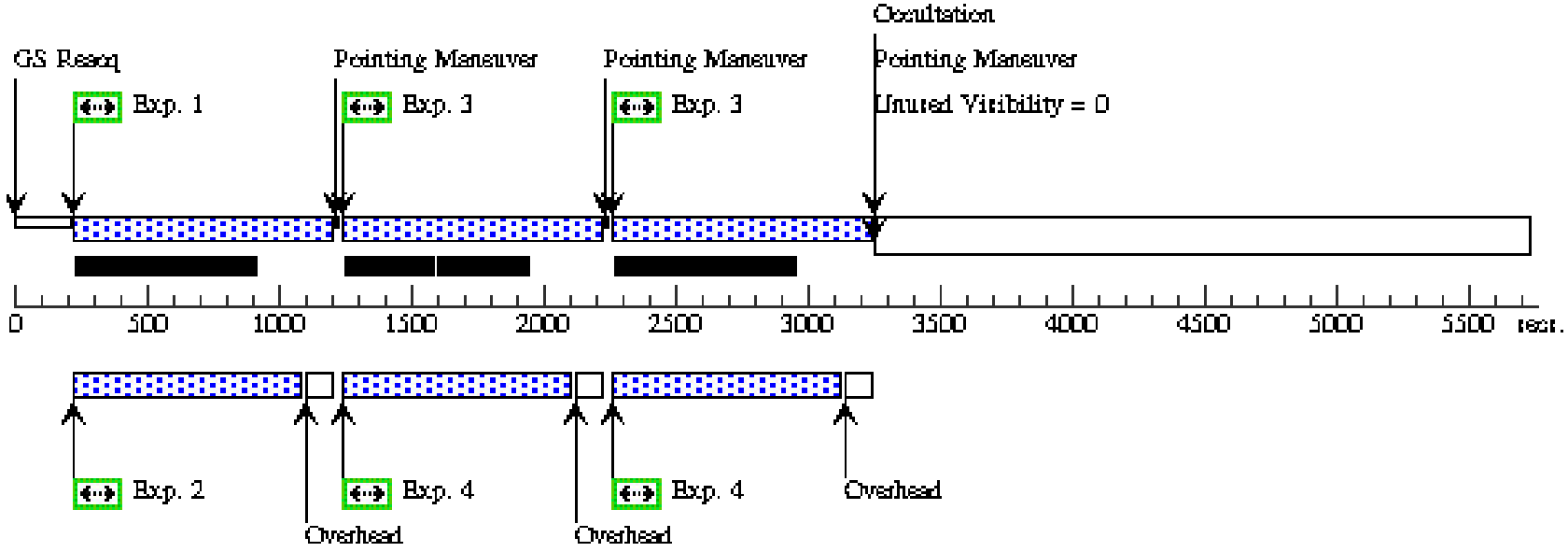
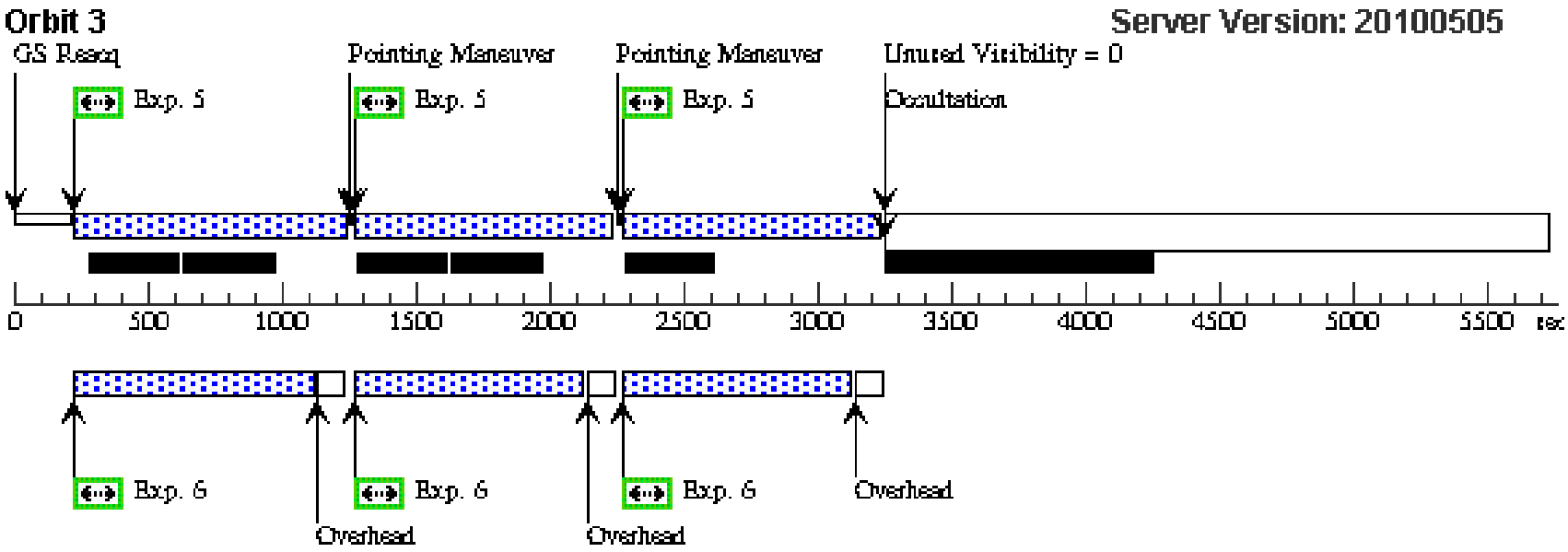


Orbit 2

Server Version: 20100505




Orbit 3
Server Version: 20100505
GS Reacq
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 0
Exp. 5
Exp. 5
Exp. 5
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 6
Exp. 6
Exp. 6
Overhead
Overhead
Overhead

Visit

Proposal 12377, Visit 02 Thu Sep 30 01:37:55 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC, WFC3/UVIS

Special Requirements: ORIENT 220D TO 230 D

Comments: ACS/WFC & WFC3/UVIS parallel observations of DLSCL J0916+2953-South subcluster. The orient constraints are required to place the WFC3 FOV as close to the East subcluster as possible.

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)
(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=2.746 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=277.936 Angle Between Sides= Center Pattern=false		(3-4)
(3)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=2.746 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=103.052 Angle Between Sides= Center Pattern=false		(5-6)

Fixed Targets

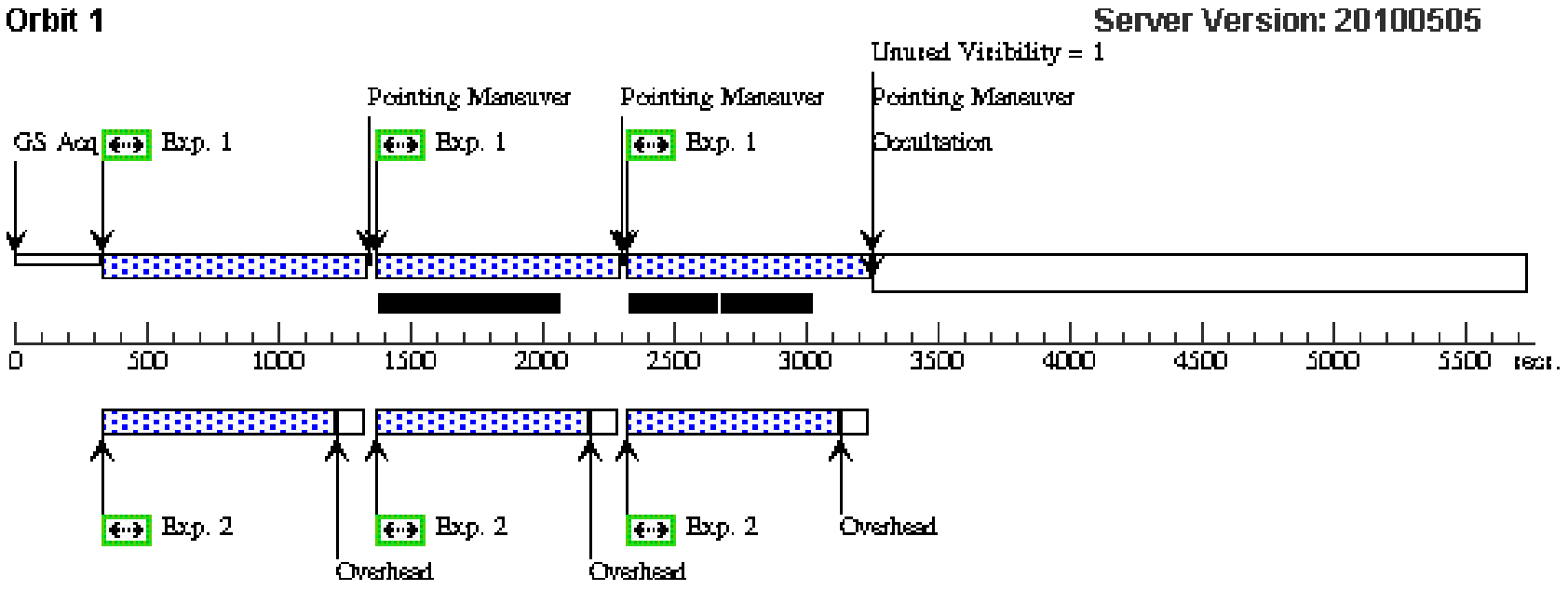
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	DLSCL-J0916+2953-SOUTH	RA: 09 16 16.0000 (139.0666667d) Dec: +29 49 25.00 (29.82361d) Equinox: J2000	Redshift: 0.53	V=22	Reference Frame: ICRS

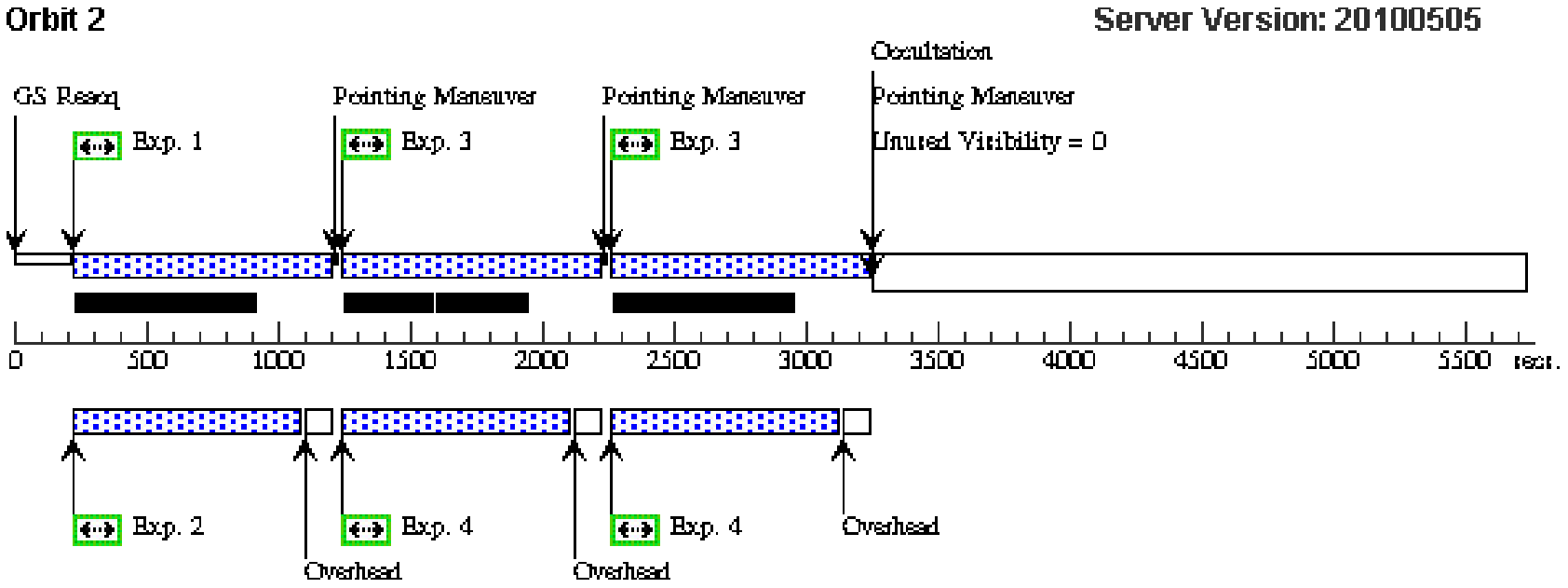
Comments: This pointing is centered on the location of the southern subcluster of DLSCL J0916+2953.

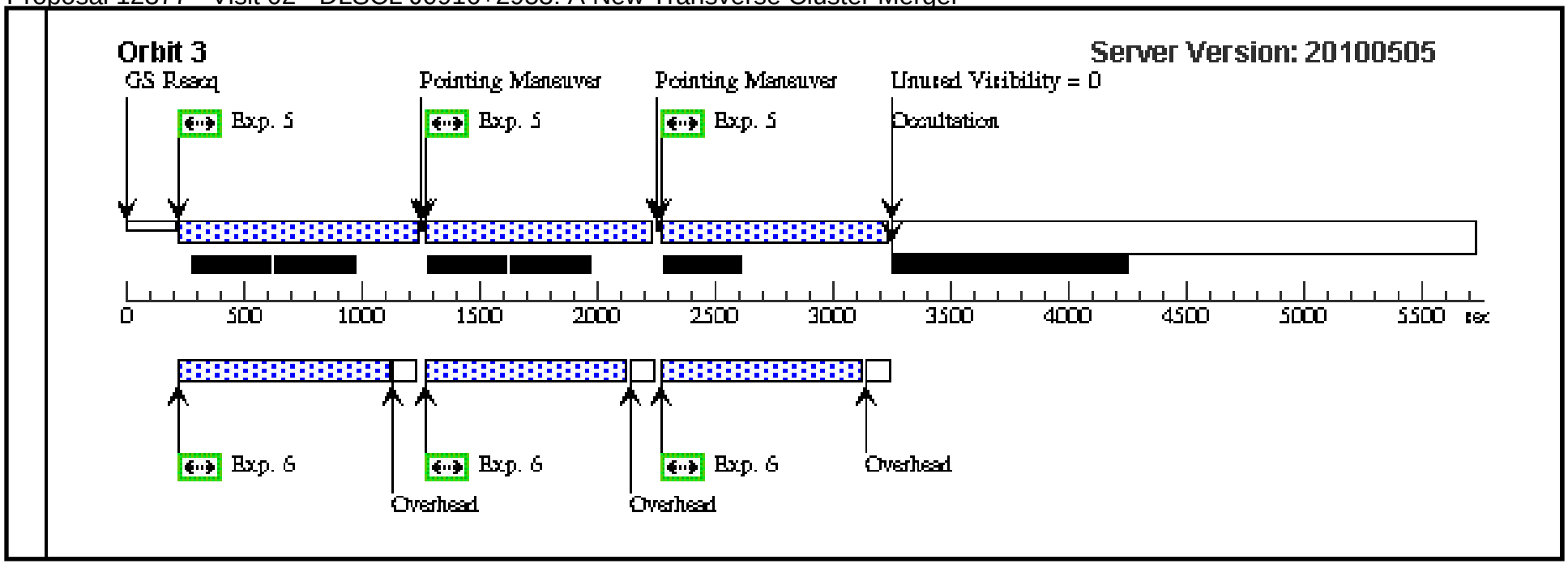
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(2) DLSCL-J0916+2953-SOUTH	ACS/WFC, ACCUM, WFCENTER	F814W			Pattern 1, Exps 1-2 (1) Prime + Parallel Group 1-2	800 Secs *[==>792.0 Secs (Pattern 1)]* *[==>792.0 Secs (Pattern 2)]* *[==>792.0 Secs (Pattern 3)]* *[==>857.0 Secs (Pattern 4)]*	 ***[1]*** ***[2]***
2		(2) DLSCL-J0916+2953-SOUTH	WFC3/UVIS, ACCUM, UVIS	F814W			Pattern 1, Exps 1-2 (1) Prime + Parallel Group 1-2	800 Secs *[==>852.0 Secs (Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>867.0 Secs (Pattern 4)]*	 ***[1]*** ***[2]***
3		(2) DLSCL-J0916+2953-SOUTH	ACS/WFC, ACCUM, WFCENTER	F814W		POS TARG 0.379,-2.72	Pattern 2, Exps 3-4 (2) Prime + Parallel Group 3-4	800 Secs *[==>857.0 Secs (Pattern 1)]* *[==>857.0 Secs (Pattern 2)]*	 ***[2]***
4		(2) DLSCL-J0916+2953-SOUTH	WFC3/UVIS, ACCUM, UVIS	F814W			Pattern 2, Exps 3-4 (2) Prime + Parallel Group 3-4	800 Secs *[==>867.0 Secs (Pattern 1)]* *[==>867.0 Secs (Pattern 2)]*	 ***[2]***
5		(2) DLSCL-J0916+2953-SOUTH	ACS/WFC, ACCUM, WFCENTER	F606W			Pattern 3, Exps 5-6 (3) Prime + Parallel Group 5-6	800 Secs *[==>840.0 Secs (Pattern 1)]* *[==>840.0 Secs (Pattern 2)]* *[==>840.0 Secs (Pattern 3)]*	 ***[3]***
6		(2) DLSCL-J0916+2953-SOUTH	WFC3/UVIS, ACCUM, UVIS	F606W			Pattern 3, Exps 5-6 (3) Prime + Parallel Group 5-6	800 Secs *[==>882.0 Secs (Pattern 1)]* *[==>850.0 Secs (Pattern 2)]* *[==>850.0 Secs (Pattern 3)]*	 ***[3]***

Orbit Structure






Orbit 3
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GS Reacq
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 0
Exp. 5
Exp. 5
Exp. 5
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 6
Exp. 6
Exp. 6
Overhead
Overhead
Overhead