



# 11643 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Globular Clusters, Dust, and Black Holes

Cycle: 17, Proposal Category: GO

(Availability Mode: SUPPORTED)

## INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
<b>Dr. Ann Zabludoff (PI)</b>	<b>University of Arizona</b>	<b>azabludoff@as.arizona.edu</b>
Mr. Yujin Yang (CoI) (Contact)	University of Arizona	yyang@as.arizona.edu
Dr. Christy A. Tremonti (CoI)	University of Arizona	tremonti@as.arizona.edu
Dr. John S. Mulchaey (CoI)	Carnegie Institution of Washington	mulchaey@ociw.edu

## 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) SDSSJ004459.24-085322.9	WFC3/UVIS	2	09-Dec-2009 21:22:40.0	yes
02	(2) SDSSJ031654.91-000231.1	WFC3/UVIS	2	09-Dec-2009 21:22:48.0	yes
03	(3) SDSSJ082701.40+214224.4	WFC3/UVIS	2	09-Dec-2009 21:22:58.0	yes
04	(4) SDSSJ094426.96+042956.8	WFC3/UVIS	3	09-Dec-2009 21:23:06.0	yes
05	(5) SDSSJ123936.05+122620.0	WFC3/UVIS	3	09-Dec-2009 21:23:17.0	yes
06	(6) SDSSJ130525.83+533530.3	WFC3/UVIS	3	09-Dec-2009 21:23:25.0	yes
07	(7) SDSSJ161330.19+510335.6	WFC3/UVIS	5	09-Dec-2009 21:23:35.0	yes
08	(8) SDSSJ162702.56+432833.9	WFC3/UVIS	3	09-Dec-2009 21:23:48.0	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>
09	(9) SDSSJ225506.80+005839.9	WFC3/UVIS	3	09-Dec-2009 21:23:55.0	yes

26 Total Orbits Used

## **ABSTRACT**

While considerable effort has been devoted to statistical studies of the origin of the red sequence of galaxies, there has been relatively little direct exploration of galaxies transforming from late to early types. Such galaxies are identified by their post-starburst spectra, bulge-dominated, tidally-disturbed morphologies, and current lack of gas. We are constructing the first detailed timeline of their evolution onto the red sequence, pinpointing when star formation ends, nuclear activity ceases, globular clusters form, and the bulk of the merging progenitors' dust disappears. Here we propose to obtain HST and Chandra imaging of nine galaxies, whose wide range of post-starburst ages we have precisely dated with a new UV-optical technique and for which we were awarded Spitzer time. We will address 1) whether the black hole-bulge mass relation arises from nuclear feedback, 2) whether the bimodality of globular cluster colors is due to young clusters produced in galaxy mergers, and 3) what happens to the dust when late types merge to form an early type.

## **OBSERVING DESCRIPTION**

We request WFC3/UVIS high-resolution imaging on scales of  $\sim 0.04''$  (1 WFC3 pixel corresponds to 15-40 pc at  $z = 0.02-0.05$ ) in order to detect globular clusters (as well as the other small-scale features) in nine post-starburst galaxies. Because the typical half-light radii of Galactic globular clusters are only several pc, they will be unresolved point sources regardless of their size and profile if they are sufficiently bright to have high signal-to-noise in a small aperture ( $2 \times 2$  pixels =  $0.08'' \times 0.08''$ ) against the underlying host galaxy light. However, their detectability drops very quickly as we degrade the resolution and pixel scale. Therefore, our need for HST is not to resolve the clusters, but rather for the improved point source sensitivity.

We request three color (F336W, F438W and F625W) imaging for the one post-starburst galaxy younger than 250 Myr (target #7), and two color (F438W and F625W) imaging for the eight remaining older targets, because 1) (F336W-F625W) color is a good age indicator for globular clusters

younger than ~200 Myr, 2) redshifted (F438W-F625W) colors at  $z \sim 0.05$  are reasonably sensitive to a wide range of ages (200 Myr to 1 Gyr), and 3) both the (F336W-F625W) and (F438W-F625W) colors rise monotonically in time allowing for a unique age solution.

[Visit]

We applied a POS-TARG (0",15") for each pattern to move the galaxies away from chip edges.

[Special Requirement]

We request Target Orientation and Coordinates for target (visit) #5,7 and 9 to make the target, its extended tidal features and companion galaxy be located within the same WPC chips. For target (visit) #1,2,3,4 and 8, we request minor orientation requirement to avoid a bright star in the same chip with our target galaxy. The impact of this minor orientation requirement on the visibility is minimal.

[Exposure Time]

From the SDSS images, we estimate the surface brightness of the most luminous galaxy can reach  $SURF(g)=13.0$  and  $SURF(r)=12.5$  at the center. Because exposures longer than 350sec (F625W) and 800sec (F438W) could exceed the CCD full-well limits, we place at least one short sub-exposure (200s and 400s in F625W and F438W, respectively) to avoid saturation.

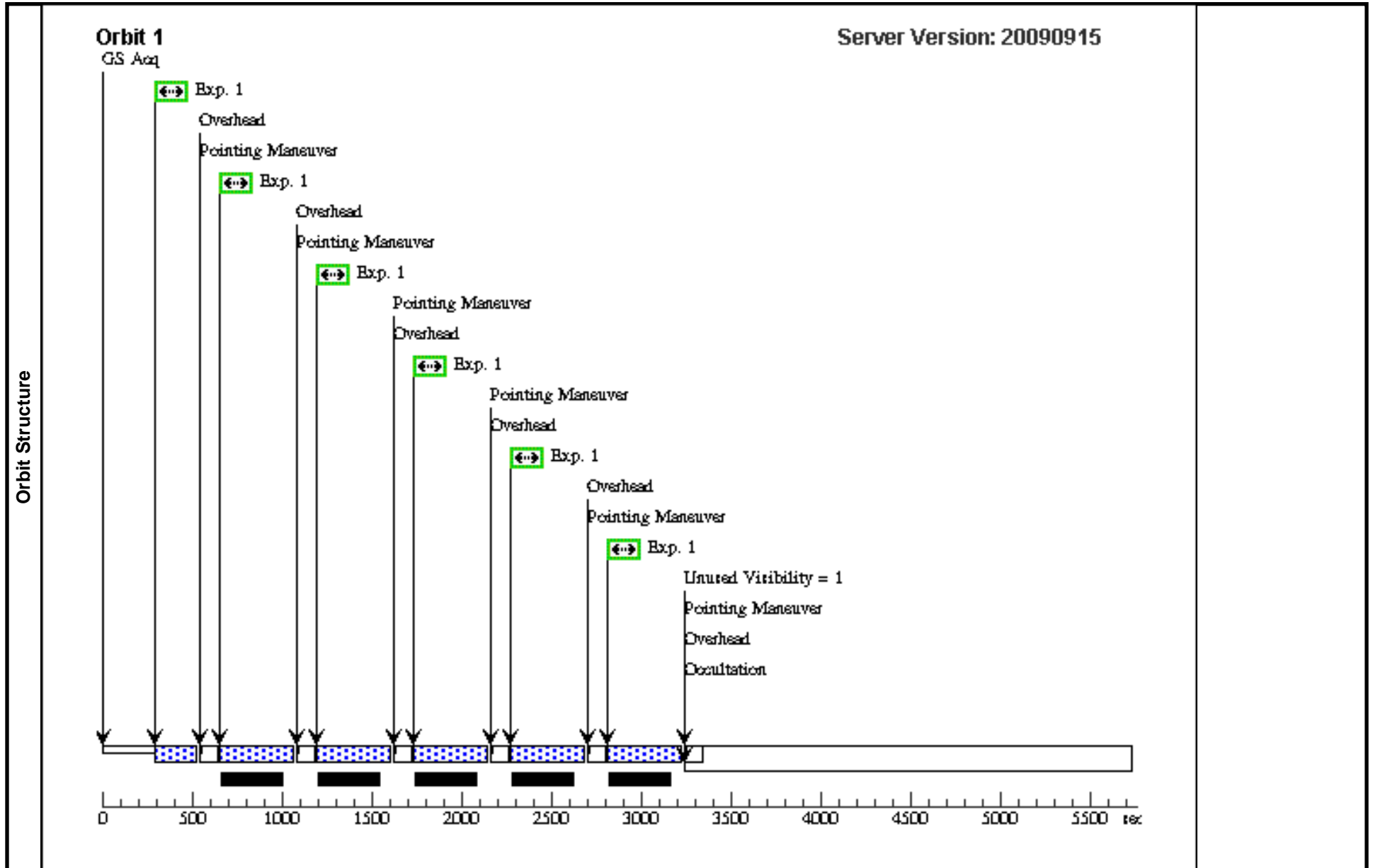
[Dithering Strategy]

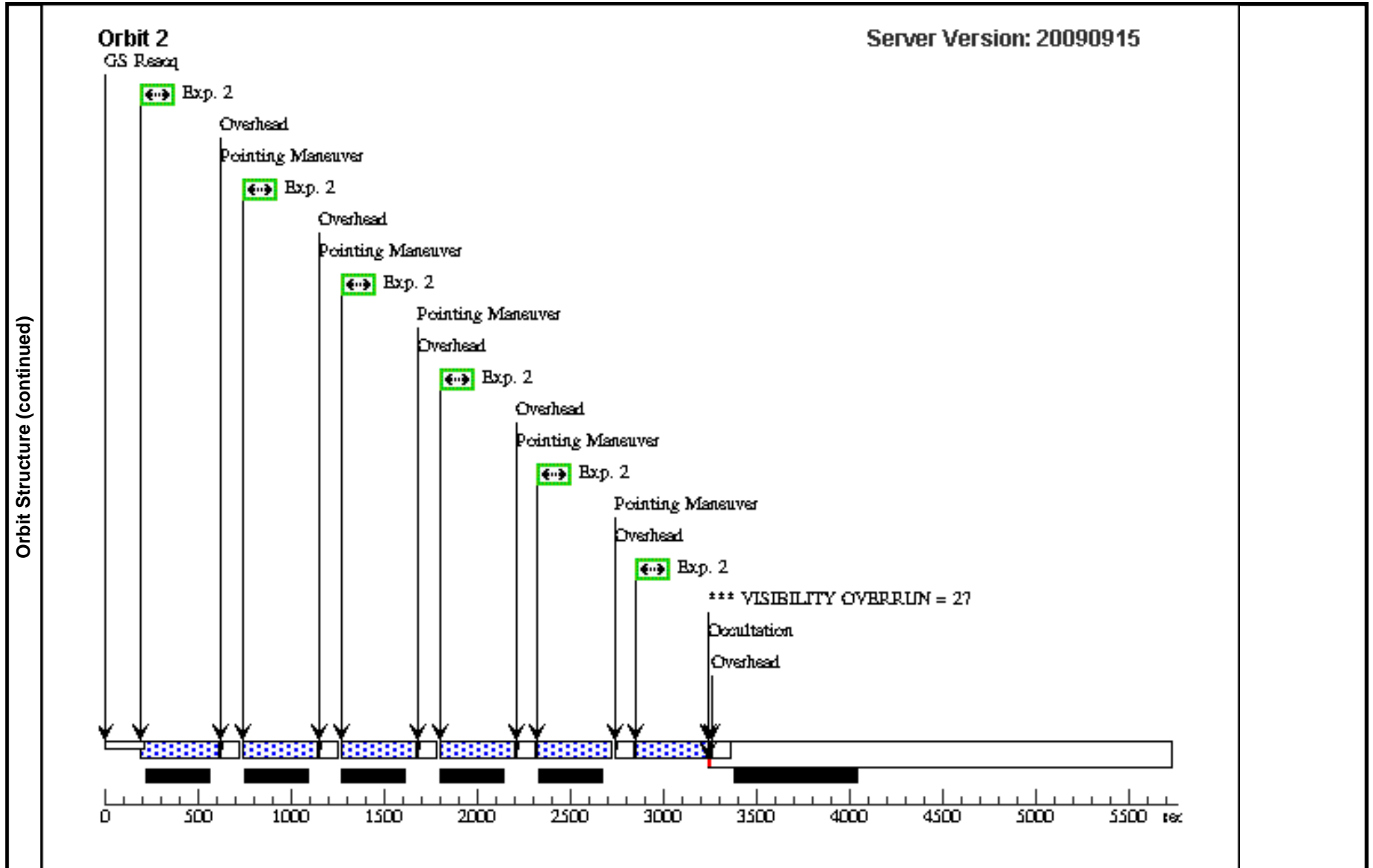
To improve the spatial resolution, eliminate hot pixels and cosmic rays, and to fill the chip gap, we request WFC3-UVIS-MOS-DITH-LINE pattern (3 mosaic pointings x 2 dithers = 6 pointings) for each filter.

Proposal 11643 - Visit 01 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

Thu Dec 10 02:24:00 GMT 2009

<b>Visit</b>	<b>Proposal 11643, Visit 01, scheduling</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 65D TO 25 D <i>Comments: We request minor orientation requirement to avoid a bright star in the same chip with our target galaxy.</i>									
	<b>Diagnosics</b> (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Exposure 1 (Pattern 1, Exps 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 2 (Pattern 1, Exps 2-2) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>	<b>Secondary Pattern</b>	<b>Exposures</b>						
	(1)	Pattern Type=WFC3-UVIS-MOS- DITH-LINE Purpose=MOSAIC Number Of Points=3 Point Spacing=2.4 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.754 Angle Between Sides= Center Pattern=true	Pattern Type=WFC3-UVIS-MOS- DITH-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.119 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=33.606 Angle Between Sides= Center Pattern=false	(1), (2)				
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(1)	SDSSJ004459.24-085322.9 Alt Name1: EA-SPITZER01	RA: 00 44 59.2400 (11.2468333d) Dec: -08 53 22.90 (-8.88969d) Equinox: J2000	Redshift: 0.020	V=15.6	Reference Frame: ICRS				
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time/[Actual Dur.]</b>	<b>Orbit</b>
	1		(1) SDSSJ004459.24-085322.9	WFC3/UVIS, ACCUM, UVIS	F625W	CR-SPLIT=NO	POS TARG 0,15	Pattern 1, Exps 1-1 (1)	400 Secs [==>200 Secs (Pattern 1,1)] [==>412.0 Secs (Pattern 1,2)] [==>412.0 Secs (Pattern 2,1)] [==>412.0 Secs (Pattern 2,2)] [==>412.0 Secs (Pattern 3,1)] [==>412.0 Secs (Pattern 3,2)]	[1]
	2		(1) SDSSJ004459.24-085322.9	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG null,15	Pattern 1, Exps 2-2 (1)	400 Secs [==>399.0 Secs (Pattern 1,1)] [==>400.0 Secs (Pattern 1,2)] [==>400 Secs (Pattern 2,1)] [==>400 Secs (Pattern 2,2)] [==>400 Secs (Pattern 3,1)] [==>400 Secs (Pattern 3,2)]	[2]

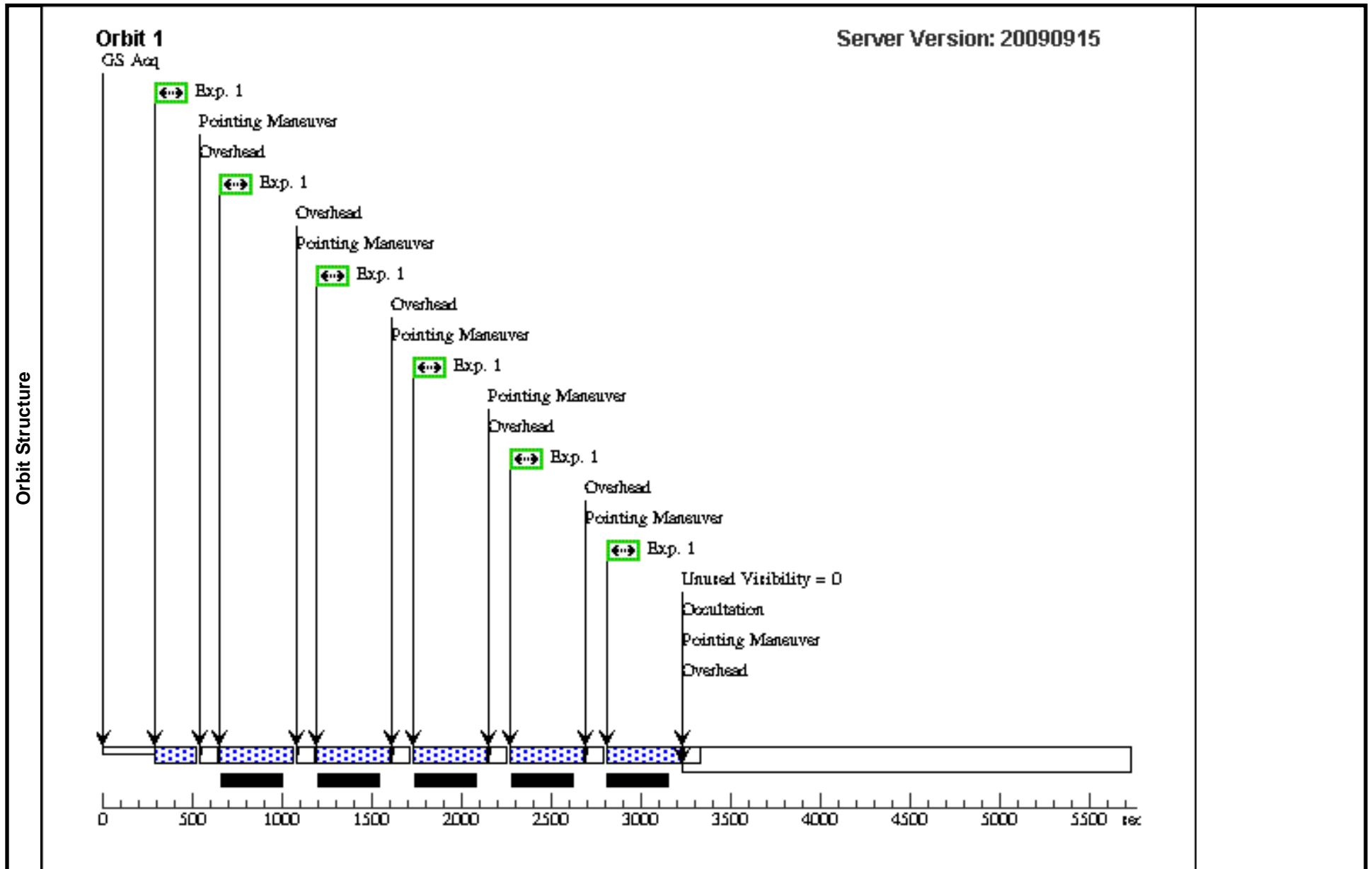




Proposal 11643 - Visit 02 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

Thu Dec 10 02:24:01 GMT 2009

<b>Visit</b>	<b>Proposal 11643, Visit 02, implementation</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 30D TO 75 D <i>Comments: We request minor orientation requirement to avoid a bright star in the same chip with our target galaxy.</i>									
	<b>Diagnosics</b> (Visit 02) Warning (Orbit Planner): VISIBILITY OVERRUN (Exposure 1 (Pattern 1, Exps 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 2 (Pattern 1, Exps 2-2) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>		<b>Secondary Pattern</b>		<b>Exposures</b>				
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=3 Point Spacing=2.4 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.754 Angle Between Sides= Center Pattern=true	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.119 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=33.606 Angle Between Sides= Center Pattern=false	(1), (2)				
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(2)	SDSSJ031654.91-000231.1 Alt Name1: EA-SPITZER02	RA: 03 16 54.9100 (49.2287917d) Dec: -00 02 31.10 (-.04197d) Equinox: J2000	Redshift: 0.023	V=16.7	Reference Frame: ICRS				
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time/[Actual Dur.]</b>	<b>Orbit</b>
	1		(2) SDSSJ031654.91-000231.1	WFC3/UVIS, ACCUM, UVIS	F625W	CR-SPLIT=NO	POS TARG 0,15; GS ACQ SCENARI O BASE1B3	Pattern 1, Exps 1-1 (1)	400 Secs [=>200 Secs (Pattern 1,1)] [=>411.0 Secs (Pattern 1,2)] [=>411.0 Secs (Pattern 2,1)] [=>411.0 Secs (Pattern 2,2)] [=>411.0 Secs (Pattern 3,1)] [=>411.0 Secs (Pattern 3,2)]	[1]
	2		(2) SDSSJ031654.91-000231.1	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG null,15	Pattern 1, Exps 2-2 (1)	400 Secs [=>398.0 Secs (Pattern 1,1)] [=>399.0 Secs (Pattern 1,2)] [=>399.0 Secs (Pattern 2,1)] [=>399.0 Secs (Pattern 2,2)] [=>399.0 Secs (Pattern 3,1)] [=>399.0 Secs (Pattern 3,2)]	[2]

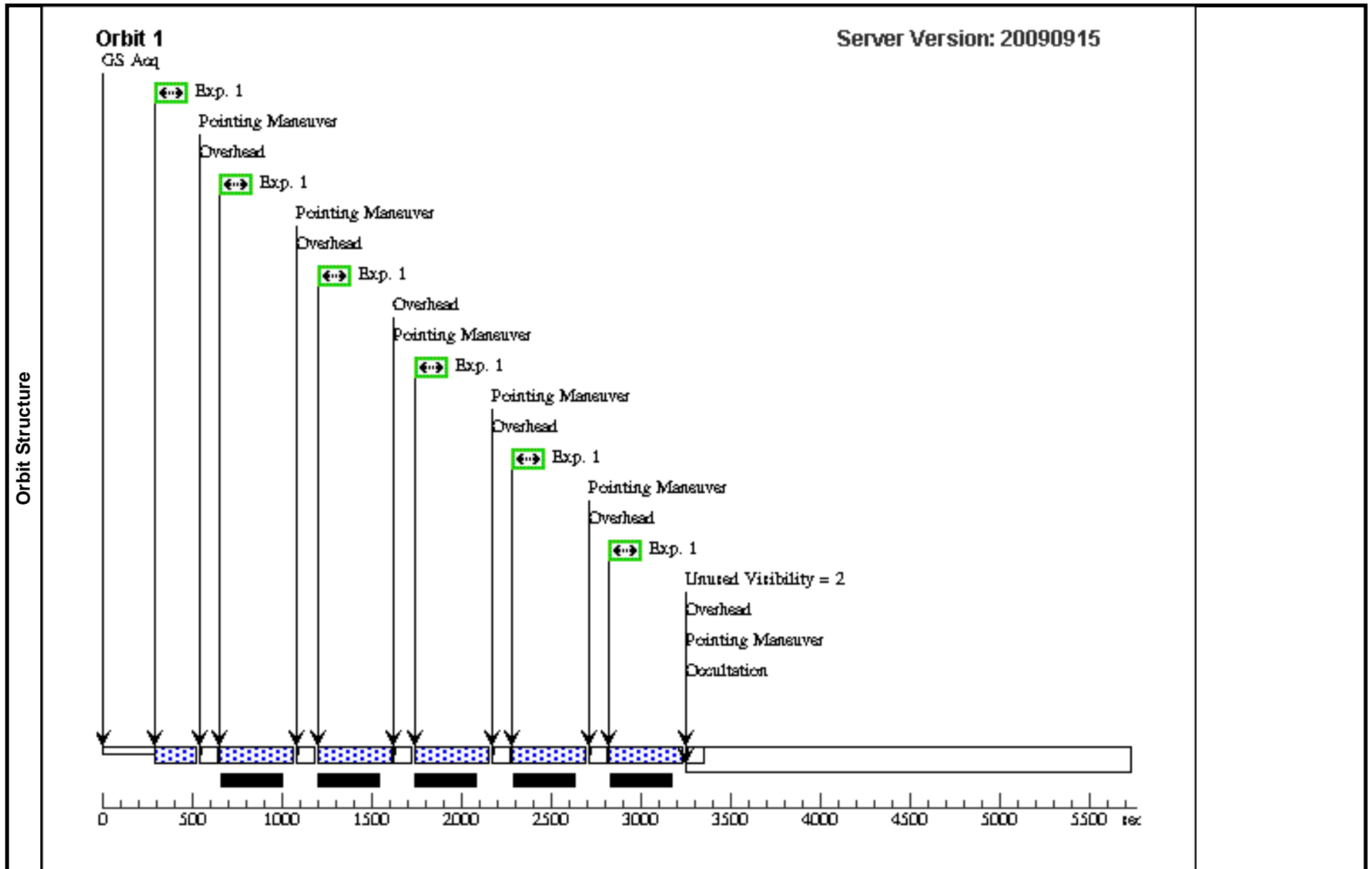


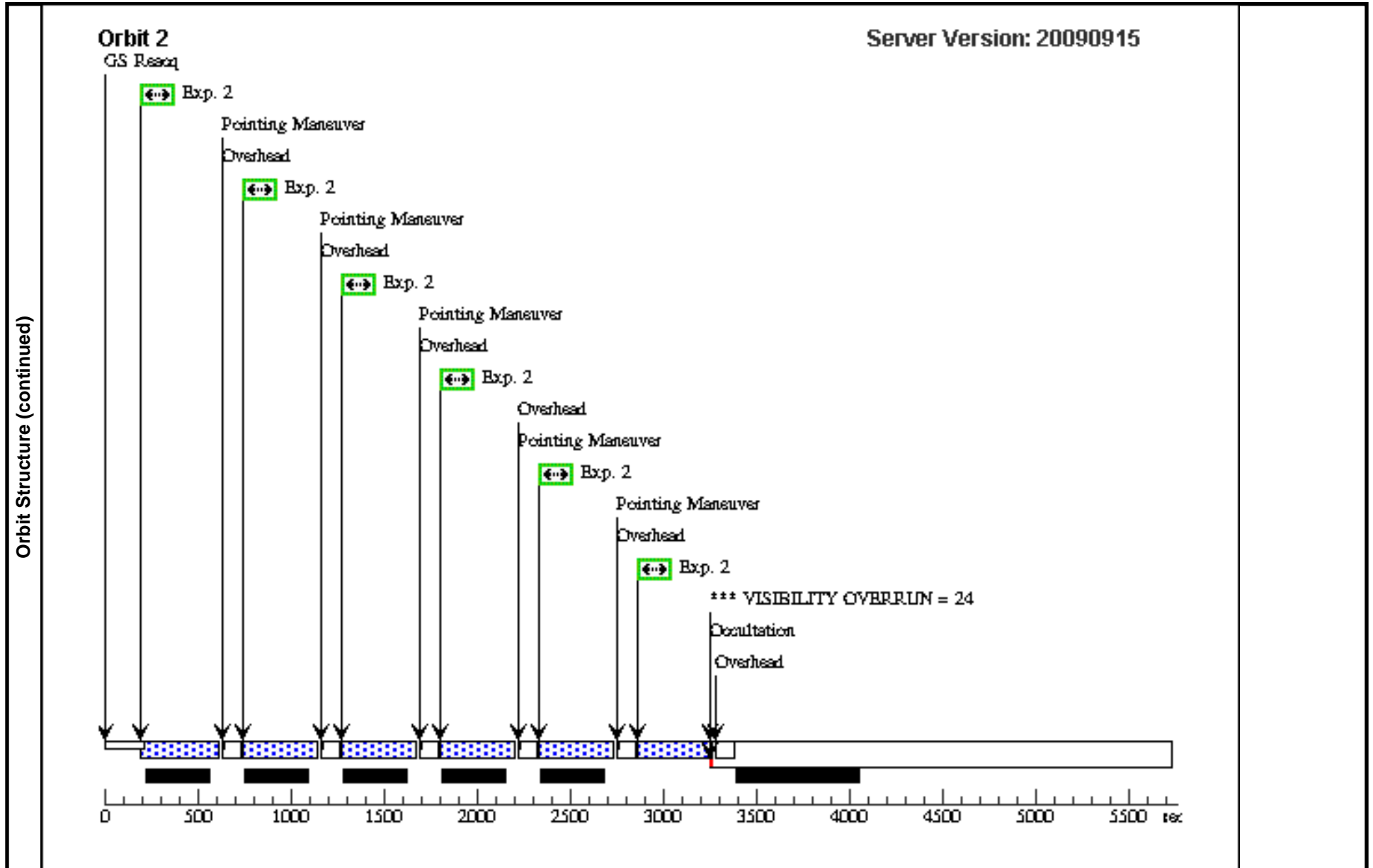


Proposal 11643 - Visit 03 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

Thu Dec 10 02:24:02 GMT 2009

<b>Visit</b>	<b>Proposal 11643, Visit 03, scheduling</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 10D TO 350 D <i>Comments: We request minor orientation requirement to avoid a bright star near the same chip with our target galaxy.</i>									
	<b>Diagnosics</b> (Visit 03) Warning (Orbit Planner): VISIBILITY OVERRUN (Exposure 1 (Pattern 1, Exps 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 2 (Pattern 1, Exps 2-2) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>		<b>Secondary Pattern</b>		<b>Exposures</b>				
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=3 Point Spacing=2.4 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.754 Angle Between Sides= Center Pattern=true	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.119 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=33.606 Angle Between Sides= Center Pattern=false	(1), (2)				
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(3)	SDSSJ082701.40+214224.4 Alt Name1: EA-SPITZER04	RA: 08 27 1.4000 (126.7558333d) Dec: +21 42 24.40 (21.70678d) Equinox: J2000	Redshift: 0.015	V=15.5	Reference Frame: ICRS				
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time/[Actual Dur.]</b>	<b>Orbit</b>
	1		(3) SDSSJ082701.40+214224.4	WFC3/UVIS, ACCUM, UVIS	F625W	CR-SPLIT=NO	POS TARG null,15	Pattern 1, Exps 1-1 (1)	400 Secs [=>200 Secs (Pattern 1,1)] [=>415.0 Secs (Pattern 1,2)] [=>415.0 Secs (Pattern 2,1)] [=>415.0 Secs (Pattern 2,2)] [=>415.0 Secs (Pattern 3,1)] [=>415.0 Secs (Pattern 3,2)]	[1]
	2		(3) SDSSJ082701.40+214224.4	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG null,15	Pattern 1, Exps 2-2 (1)	400 Secs [=>402.0 Secs (Pattern 1,1)] [=>402.0 Secs (Pattern 1,2)] [=>402.0 Secs (Pattern 2,1)] [=>402.0 Secs (Pattern 2,2)] [=>402.0 Secs (Pattern 3,1)] [=>402.0 Secs (Pattern 3,2)]	[2]





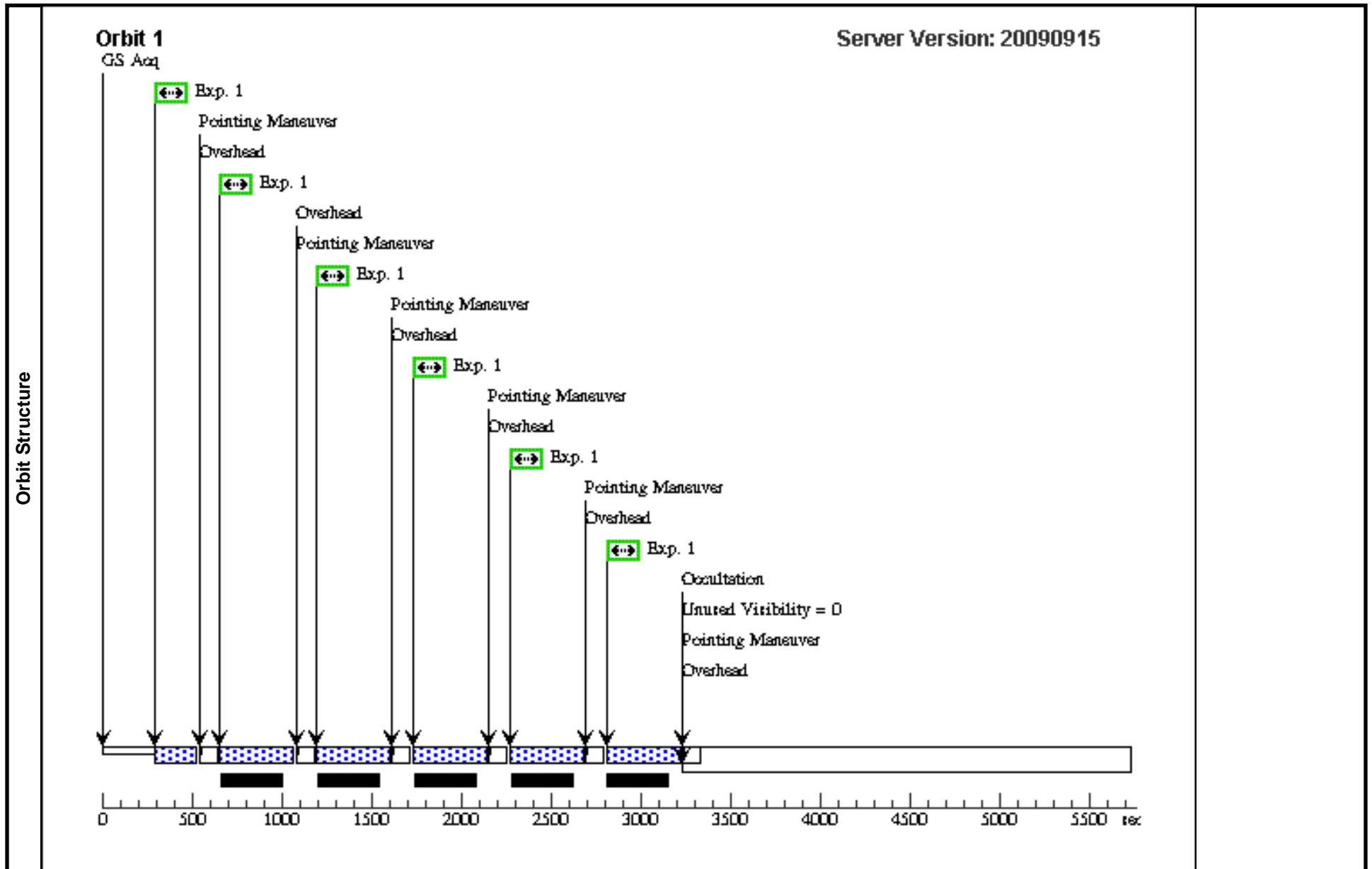
Proposal 11643 - Visit 04 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

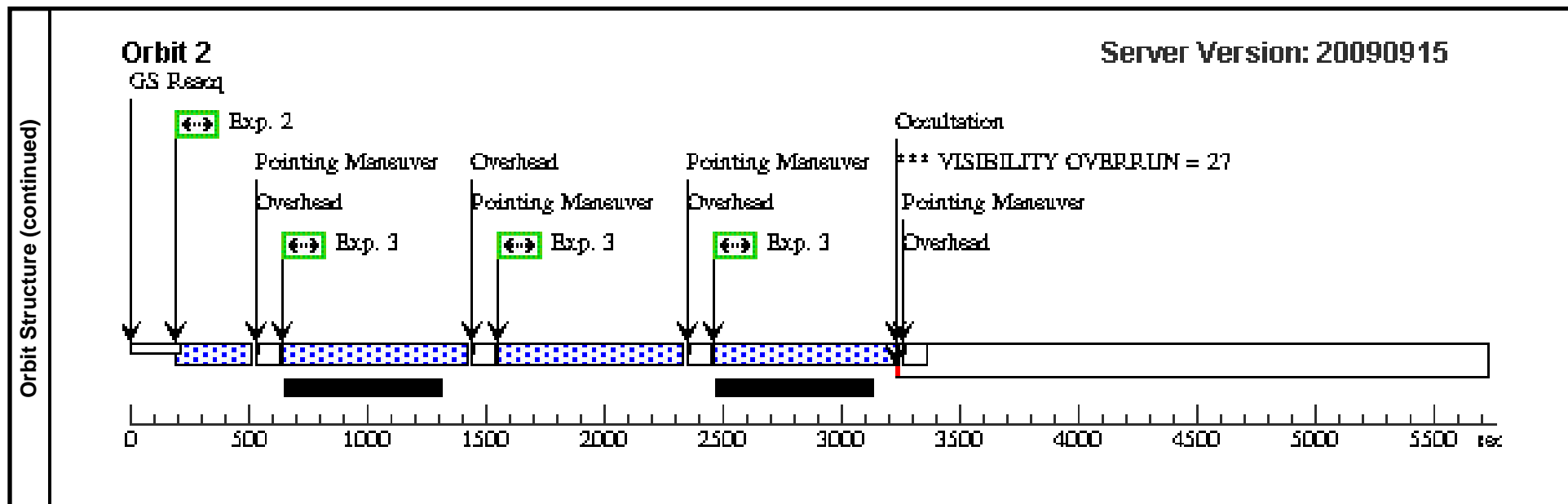
Thu Dec 10 02:24:03 GMT 2009

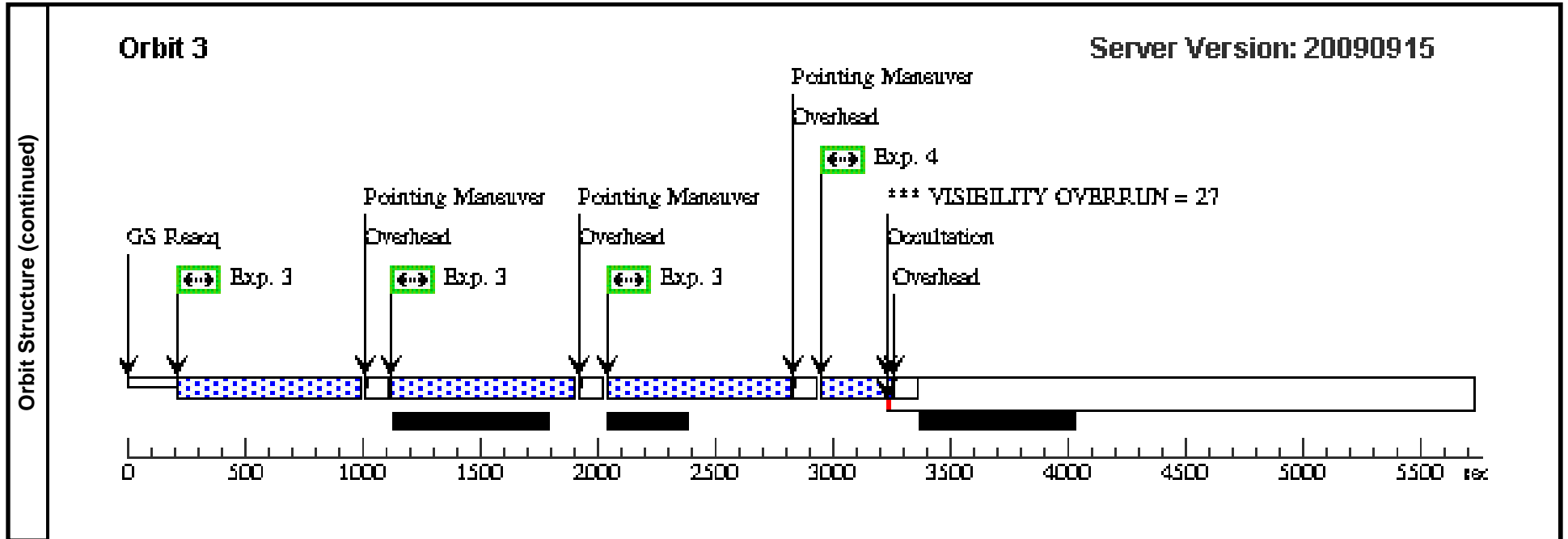
<b>Visit</b>	<b>Proposal 11643, Visit 04, scheduling</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 15D TO 350 D <i>Comments: We request minor orientation requirement to avoid a bright star in the same chip with our target galaxy.</i>									
	<b>Diagnosics</b> (Visit 04) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 04) Warning (Orbit Planner): VISIBILITY OVERRUN (Exposure 1 (Pattern 1, Exps 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 3 (Pattern 1, Exps 3-3) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>		<b>Secondary Pattern</b>		<b>Exposures</b>				
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=3 Point Spacing=2.4 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.754 Angle Between Sides= Center Pattern=true	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.119 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=33.606 Angle Between Sides= Center Pattern=false	(1), (3)				
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(4)	SDSSJ094426.96+042956.8 Alt Name1: EA-SPITZER05	RA: 09 44 26.9600 (146.1123333d) Dec: +04 29 56.80 (4.49911d) Equinox: J2000	Redshift: 0.047	V=16.8	Reference Frame: ICRS				
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time/[Actual Dur.]</b>	<b>Orbit</b>
	1		(4) SDSSJ094426.96+042956.8	WFC3/UVIS, ACCUM, UVIS	F625W	CR-SPLIT=NO	POS TARG 0,15	Pattern 1, Exps 1-1 (1)	400 Secs [==>200 Secs (Pattern 1,1)] [==>411.0 Secs (Pattern 1,2)] [==>411.0 Secs (Pattern 2,1)] [==>411.0 Secs (Pattern 2,2)] [==>411.0 Secs (Pattern 3,1)] [==>411.0 Secs (Pattern 3,2)]	[1]
	2		(4) SDSSJ094426.96+042956.8	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15		400 Secs [==>300 Secs ]	[2]

Proposal 11643 - Visit 04 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	3	(4) SDSSJ094426.96 +042956.8	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG null,15	Pattern 1, Exps 3-3 (1)	400 Secs	[=>783.0 Secs (Pattern 1,1)]	[2]
								[=>783.0 Secs (Pattern 1,2)]		
								[=>783.0 Secs (Pattern 2,1)]		
								[=>783.0 Secs (Pattern 2,2)]		
								[=>783.0 Secs (Pattern 3,1)]	[3]	
								[=>783.0 Secs (Pattern 3,2)]		
4	(4) SDSSJ094426.96 +042956.8	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15		400 Secs			
								[=>300.0 Secs ]	[3]	







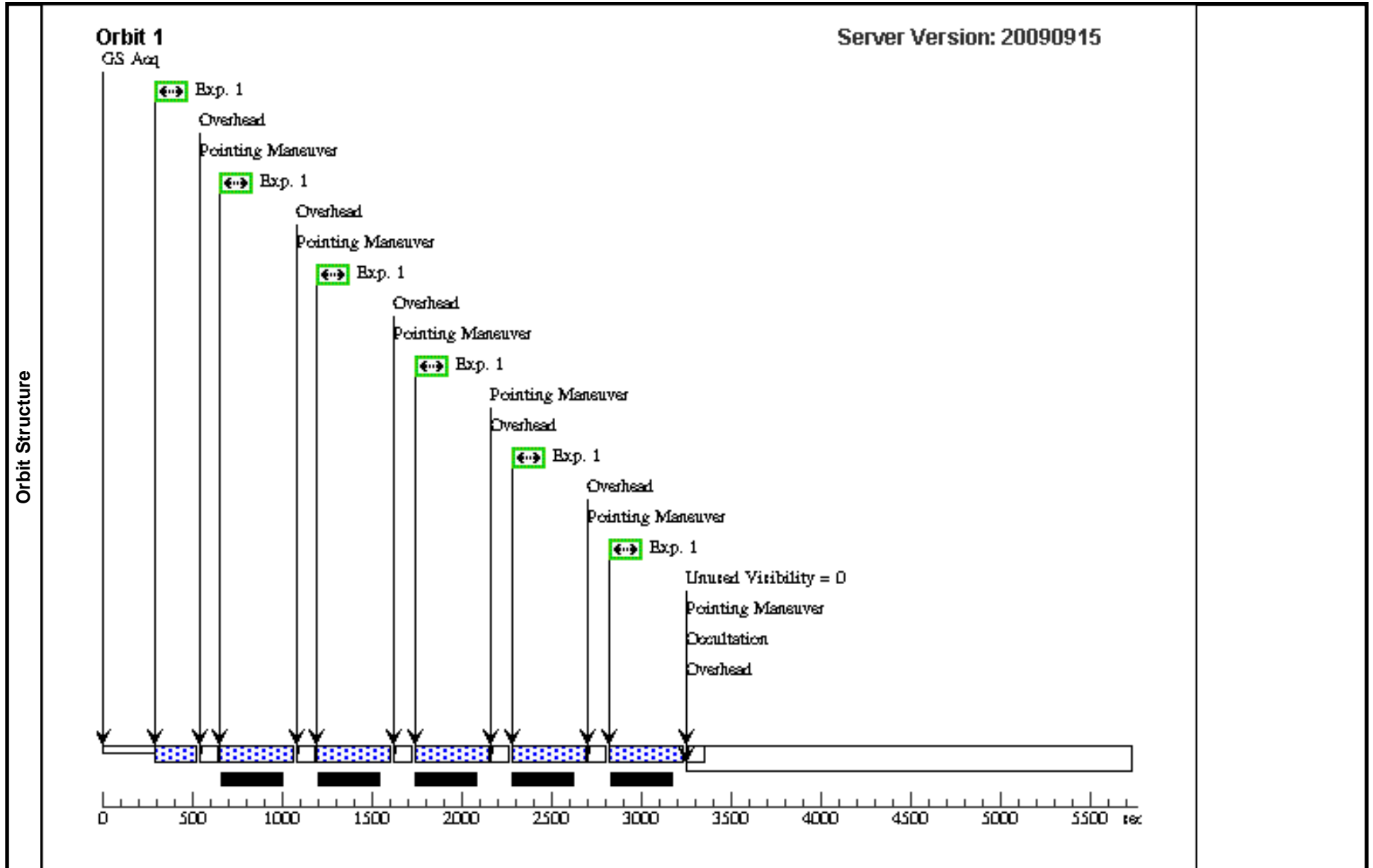
Proposal 11643 - Visit 05 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

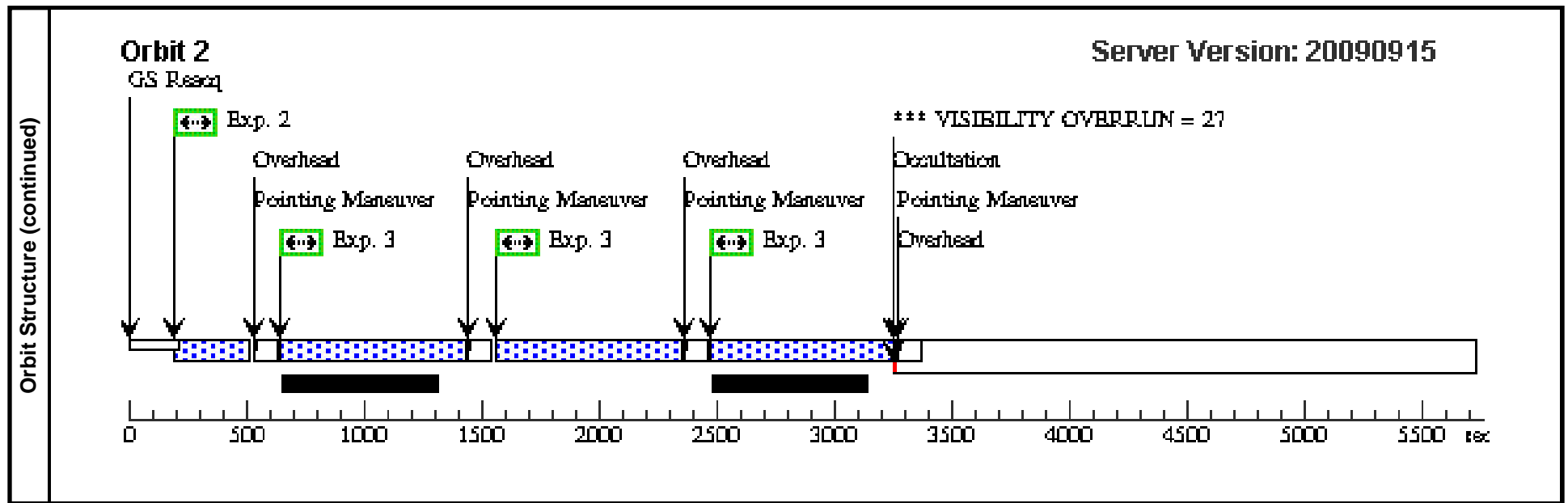
Thu Dec 10 02:24:04 GMT 2009

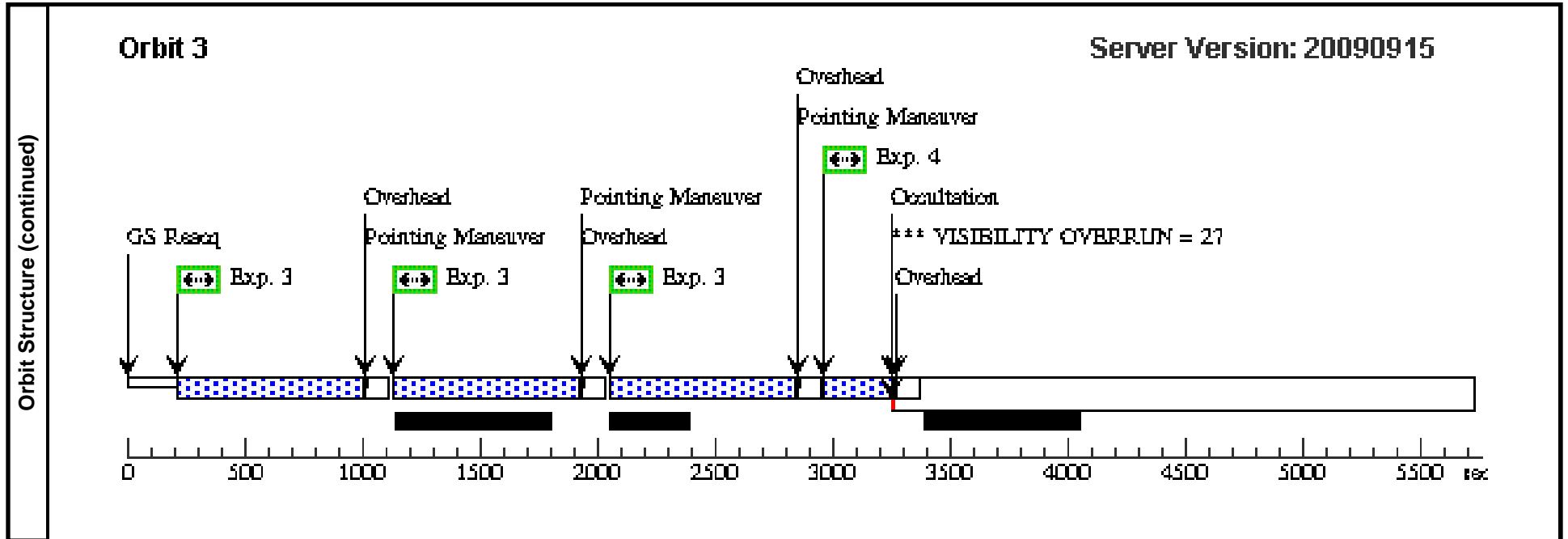
<b>Visit</b>	<b>Proposal 11643, Visit 05, scheduling</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 70D TO 130 D <i>Comments: We request an orientation requirement to include a companion galaxy.</i>									
	<b>Diagnosics</b> (Visit 05) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 05) Warning (Orbit Planner): VISIBILITY OVERRUN (Exposure 1 (Pattern 1, Exps 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 3 (Pattern 1, Exps 3-3) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>		<b>Secondary Pattern</b>		<b>Exposures</b>				
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=3 Point Spacing=2.4 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.754 Angle Between Sides= Center Pattern=true	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.119 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=33.606 Angle Between Sides= Center Pattern=false	(1), (3)				
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(5)	SDSSJ123936.05+122620.0 Alt Name1: EA-SPITZER06	RA: 12 39 36.0500 (189.9002083d) Dec: +12 26 20.00 (12.43889d) Equinox: J2000	Redshift: 0.041	V=16.4	Reference Frame: ICRS				
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time/[Actual Dur.]</b>	<b>Orbit</b>
	1		(5) SDSSJ123936.05+122620.0	WFC3/UVIS, ACCUM, UVIS	F625W	CR-SPLIT=NO	POS TARG 0,15; GS ACQ SCENARI O BASE1B3	Pattern 1, Exps 1-1 (1)	400 Secs [==>200 Secs (Pattern 1,1)] [==>414.0 Secs (Pattern 1,2)] [==>414.0 Secs (Pattern 2,1)] [==>414.0 Secs (Pattern 2,2)] [==>414.0 Secs (Pattern 3,1)] [==>414.0 Secs (Pattern 3,2)]	[1]
	2		(5) SDSSJ123936.05+122620.0	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15		400 Secs [==>300 Secs ]	[2]

Proposal 11643 - Visit 05 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	3	(5) SDSSJ123936.05 +122620.0	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG null,15	Pattern 1, Exps 3-3 (1)	400 Secs	[=>788.0 Secs (Pattern 1,1)]	[2]
								[=>788.0 Secs (Pattern 1,2)]		
								[=>788.0 Secs (Pattern 2,1)]		
								[=>788.0 Secs (Pattern 2,2)]		
								[=>788.0 Secs (Pattern 3,1)]	[3]	
								[=>788.0 Secs (Pattern 3,2)]		
4	(5) SDSSJ123936.05 +122620.0	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15		400 Secs			
								[=>300.0 Secs ]	[3]	







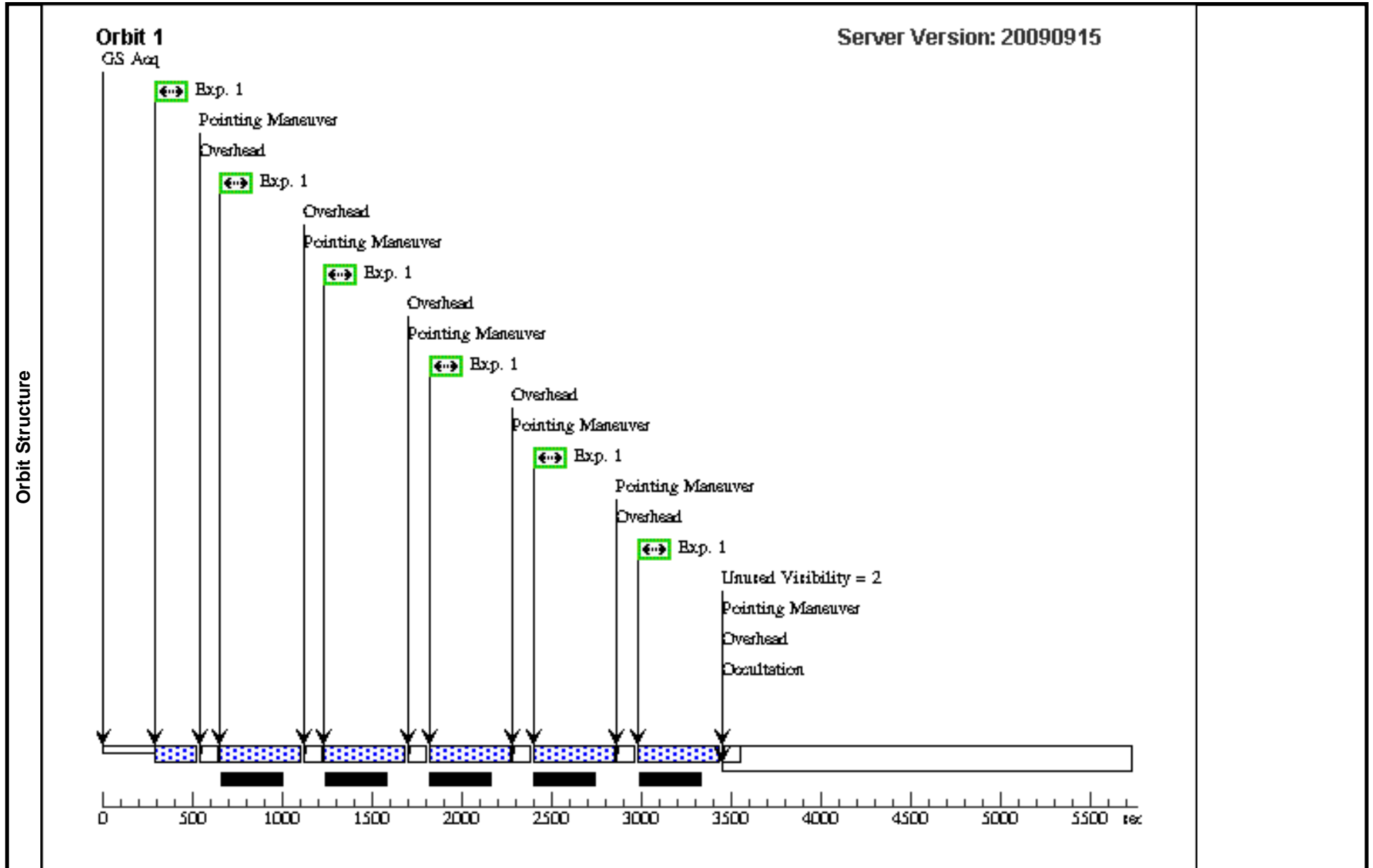
Proposal 11643 - Visit 06 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

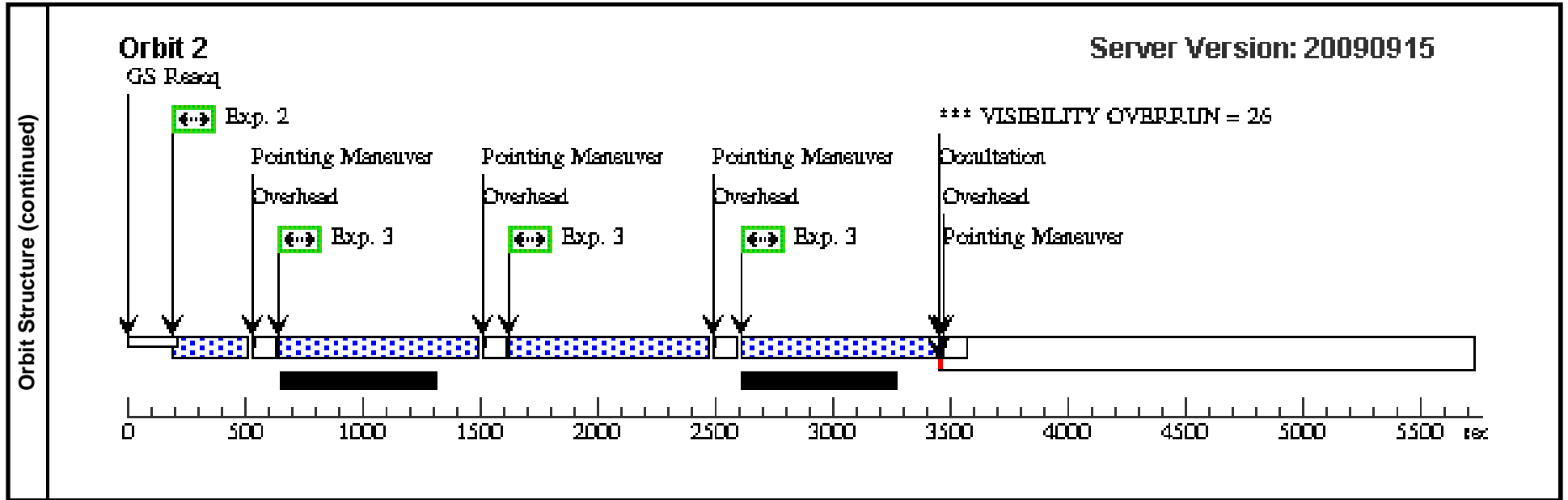
Thu Dec 10 02:24:05 GMT 2009

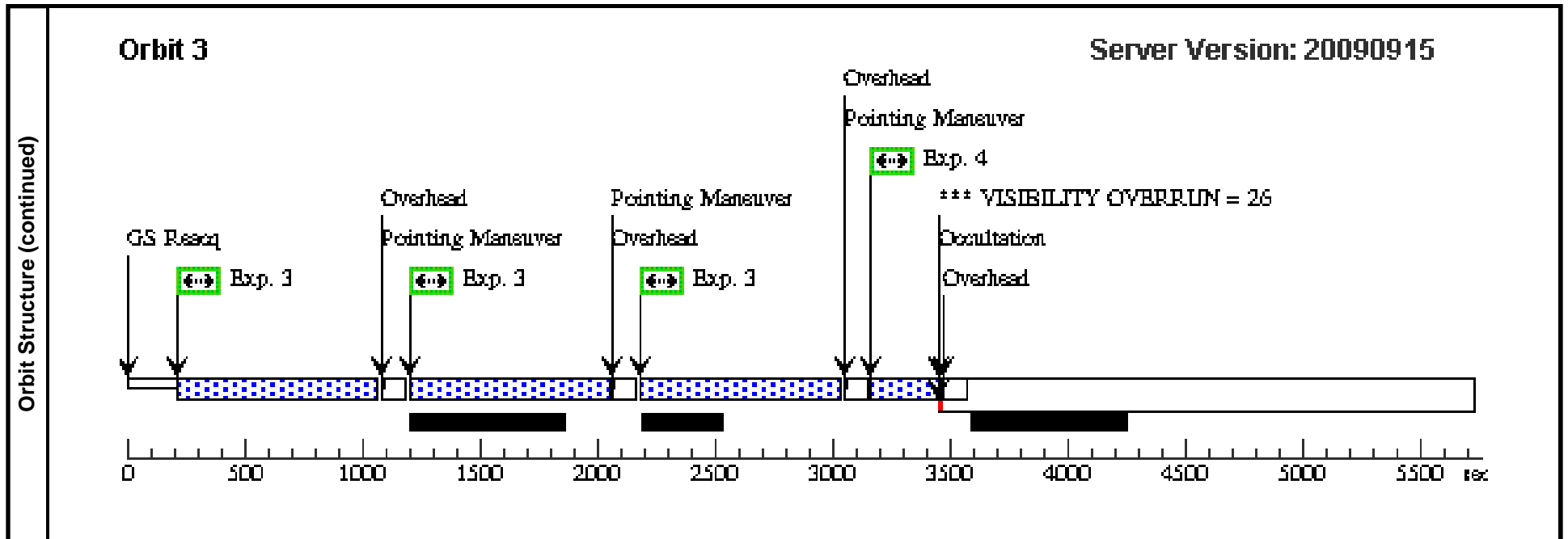
<b>Visit</b>	<b>Proposal 11643, Visit 06, scheduling</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: (none) <i>Comments: No special requirement.</i>									
	<b>Diagnosics</b> (Visit 06) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 06) Warning (Orbit Planner): VISIBILITY OVERRUN (Exposure 1 (Pattern 1, Exps 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 3 (Pattern 1, Exps 3-3) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>		<b>Secondary Pattern</b>		<b>Exposures</b>				
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=3 Point Spacing=2.4 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.754 Angle Between Sides= Center Pattern=true	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.119 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=33.606 Angle Between Sides= Center Pattern=false	(1), (3)				
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(6)	SDSSJ130525.83+533530.3 Alt Name1: EA-SPITZER10	RA: 13 05 25.8300 (196.3576250d) Dec: +53 35 30.30 (53.59175d) Equinox: J2000	Redshift: 0.038	V=15.7	Reference Frame: ICRS				
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time/[Actual Dur.]</b>	<b>Orbit</b>
	1		(6) SDSSJ130525.83+533530.3	WFC3/UVIS, ACCUM, UVIS	F625W	CR-SPLIT=NO	POS TARG 0,15	Pattern 1, Exps 1-1 (1)	400 Secs [==>200 Secs (Pattern 1,1)] [==>454.0 Secs (Pattern 1,2)] [==>454.0 Secs (Pattern 2,1)] [==>454.0 Secs (Pattern 2,2)] [==>454.0 Secs (Pattern 3,1)] [==>454.0 Secs (Pattern 3,2)]	[1]
	2		(6) SDSSJ130525.83+533530.3	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15		400 Secs [==>300 Secs ]	[2]

Proposal 11643 - Visit 06 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
		3		(6) SDSSJ130525.83 +533530.3	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG null,15	Pattern 1, Exps 3-3 (1)	400 Secs
[==>855.0 Secs (Pattern 1,1)]										
[==>855.0 Secs (Pattern 1,2)]										[2]
[==>855.0 Secs (Pattern 2,1)]										
[==>855.0 Secs (Pattern 2,2)]										
[==>855.0 Secs (Pattern 3,1)]	[3]									
								[==>855.0 Secs (Pattern 3,2)]		
	4		(6) SDSSJ130525.83 +533530.3	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15			
								400 Secs		
								[==>300.0 Secs ]	[3]	







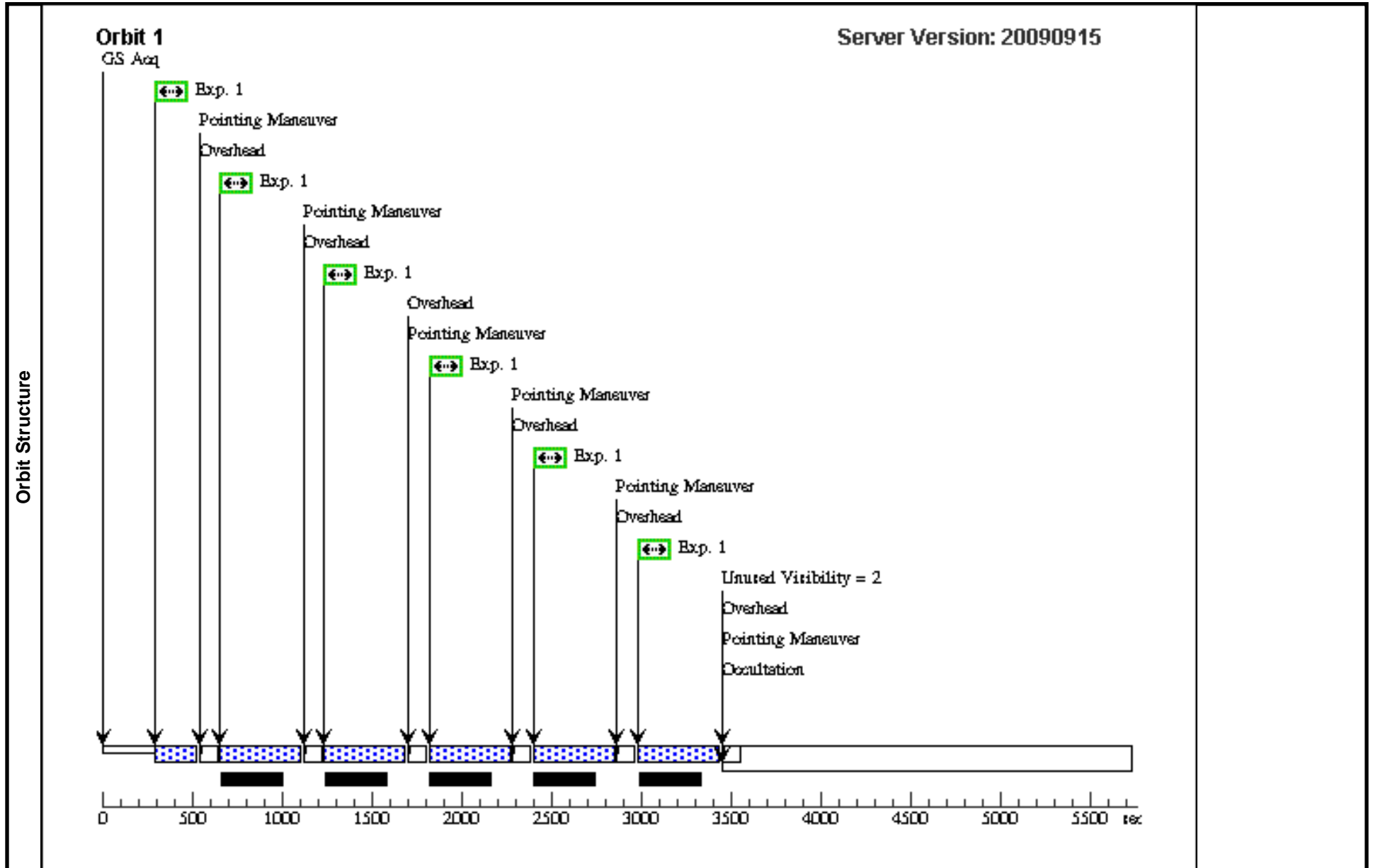
Proposal 11643 - Visit 07 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

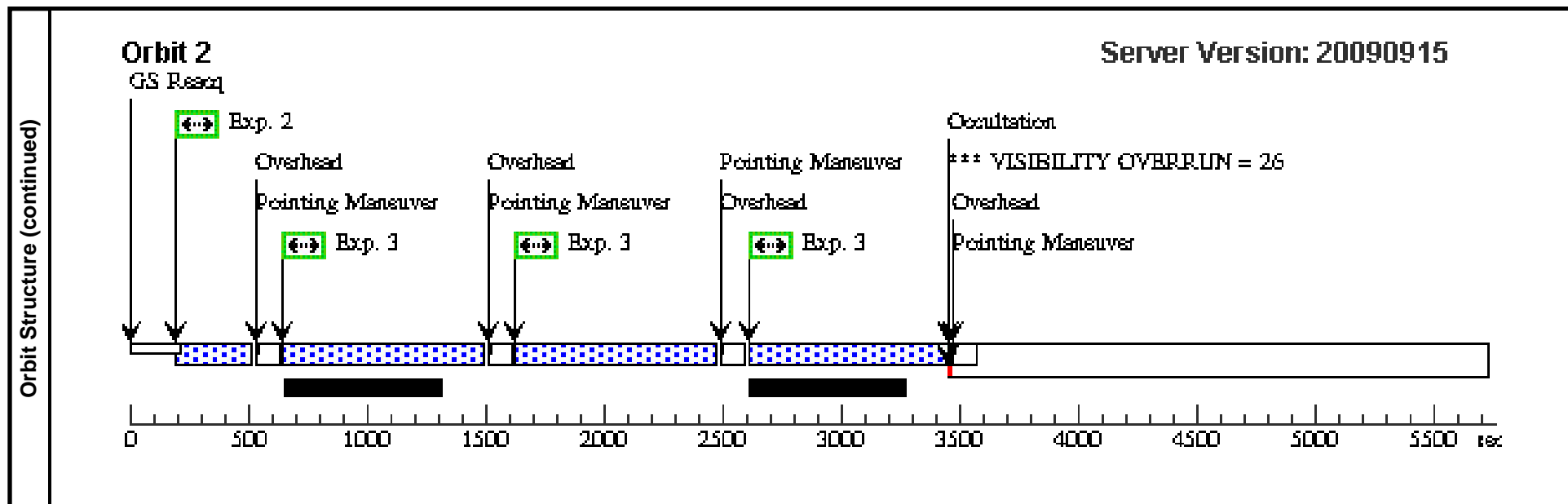
Thu Dec 10 02:24:06 GMT 2009

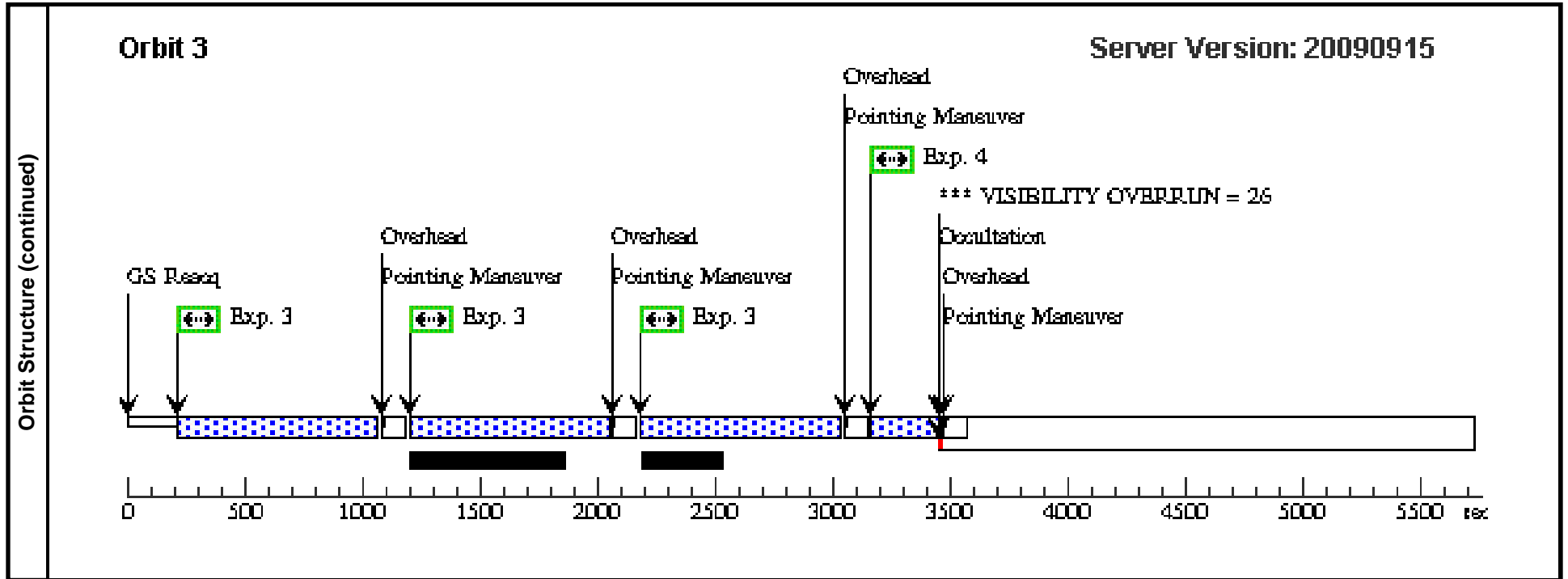
<b>Visit</b>	<b>Proposal 11643, Visit 07, scheduling</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 100D TO 280 D <i>Comments: We request an orientation requirement to include a companion galaxy.</i>									
	(Visit 07) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 07) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 07) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 07) Warning (Orbit Planner): VISIBILITY OVERRUN (Exposure 1 (Pattern 1, Exps 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 3 (Pattern 1, Exps 3-3) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 5 (Pattern 1, Exps 5-5) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
<b>Diagnosics</b>										
<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>			<b>Secondary Pattern</b>			<b>Exposures</b>		
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=3 Point Spacing=2.4 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.754 Angle Between Sides= Center Pattern=true	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.119 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=33.606 Angle Between Sides= Center Pattern=false	(1), (3), (5)				
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(7)	SDSSJ161330.19+510335.6 Alt Name1: EA-SPITZER12	RA: 16 13 30.1900 (243.3757917d) Dec: +51 03 35.60 (51.05989d) Equinox: J2000	Redshift: 0.034	V=17.3	Reference Frame: ICRS				
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time/[Actual Dur.]</b>	<b>Orbit</b>
	1	(7) SDSSJ161330.19+510335.6	(7) SDSSJ161330.19+510335.6	WFC3/UVIS, ACCUM, UVIS	F625W	CR-SPLIT=NO	POS TARG 0,15	Pattern 1, Exps 1-1 (1)	400 Secs [==>200 Secs (Pattern 1,1)] [==>454.0 Secs (Pattern 1,2)] [==>454.0 Secs (Pattern 2,1)] [==>454.0 Secs (Pattern 2,2)] [==>454.0 Secs (Pattern 3,1)] [==>454.0 Secs (Pattern 3,2)]	[1]
2	(7) SDSSJ161330.19+510335.6	(7) SDSSJ161330.19+510335.6	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15		400 Secs [==>300 Secs ]	[2]	

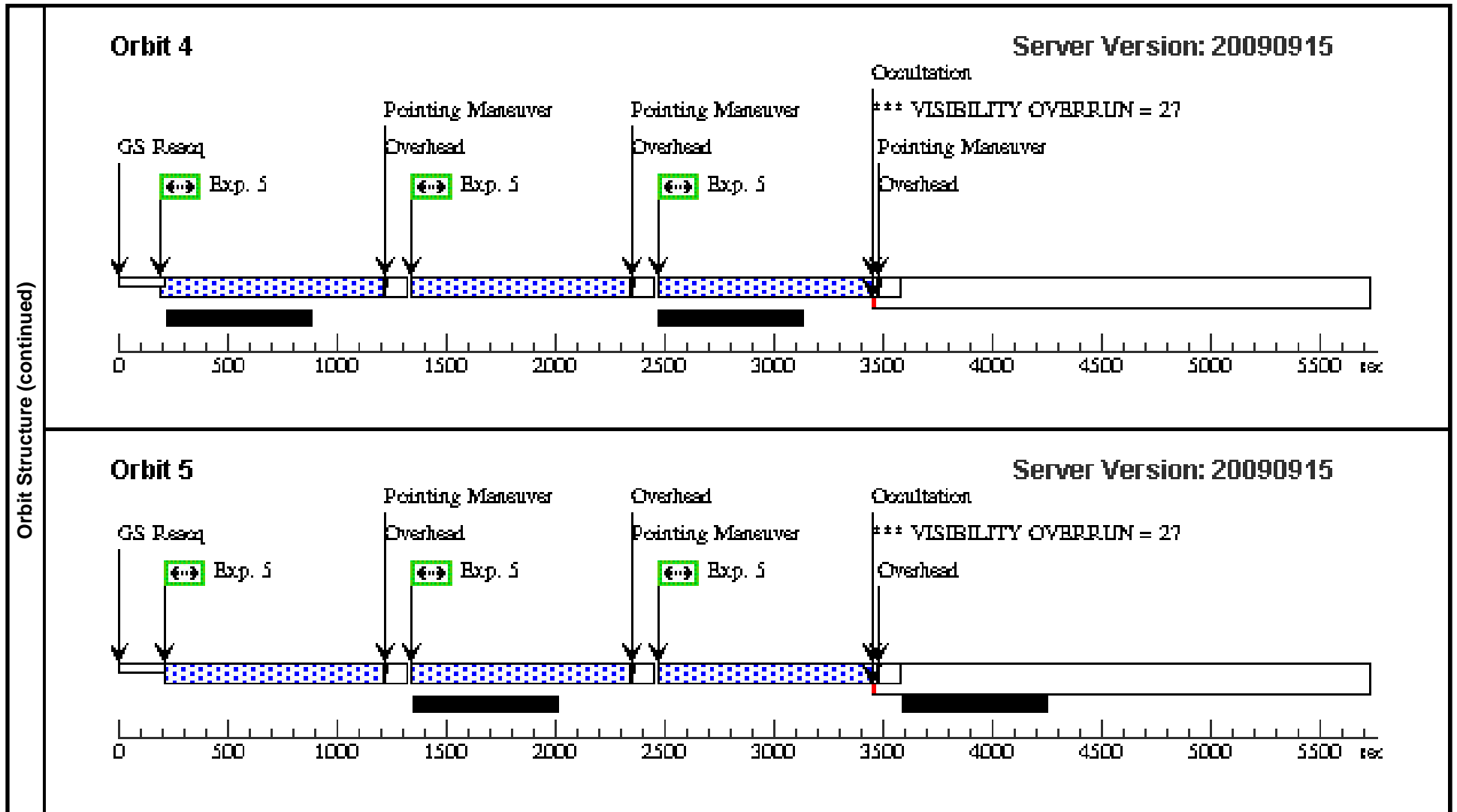
Proposal 11643 - Visit 07 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
<b>Exposures (continued)</b>	3	(7) SDSSJ161330.19 +510335.6	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG null,15	Pattern 1, Exps 3-3 (1)	400 Secs	
								[==>855.0 Secs (Pattern 1,1)]	
								[==>855.0 Secs (Pattern 1,2)]	[2]
								[==>855.0 Secs (Pattern 2,1)]	
								[==>855.0 Secs (Pattern 2,2)]	
								[==>855.0 Secs (Pattern 3,1)]	[3]
	4	(7) SDSSJ161330.19 +510335.6	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15		400 Secs	
								[==>300 Secs ]	[3]
	5	(7) SDSSJ161330.19 +510335.6	WFC3/UVIS, ACCUM, UVIS	F336W	CR-SPLIT=NO	POS TARG null,15	Pattern 1, Exps 5-5 (1)	400 Secs	
								[==>998.0 Secs (Pattern 1,1)]	
								[==>998.0 Secs (Pattern 1,2)]	[4]
								[==>998.0 Secs (Pattern 2,1)]	
[==>998.0 Secs (Pattern 2,2)]									
[==>998.0 Secs (Pattern 3,1)]								[5]	
[==>998.0 Secs (Pattern 3,2)]									









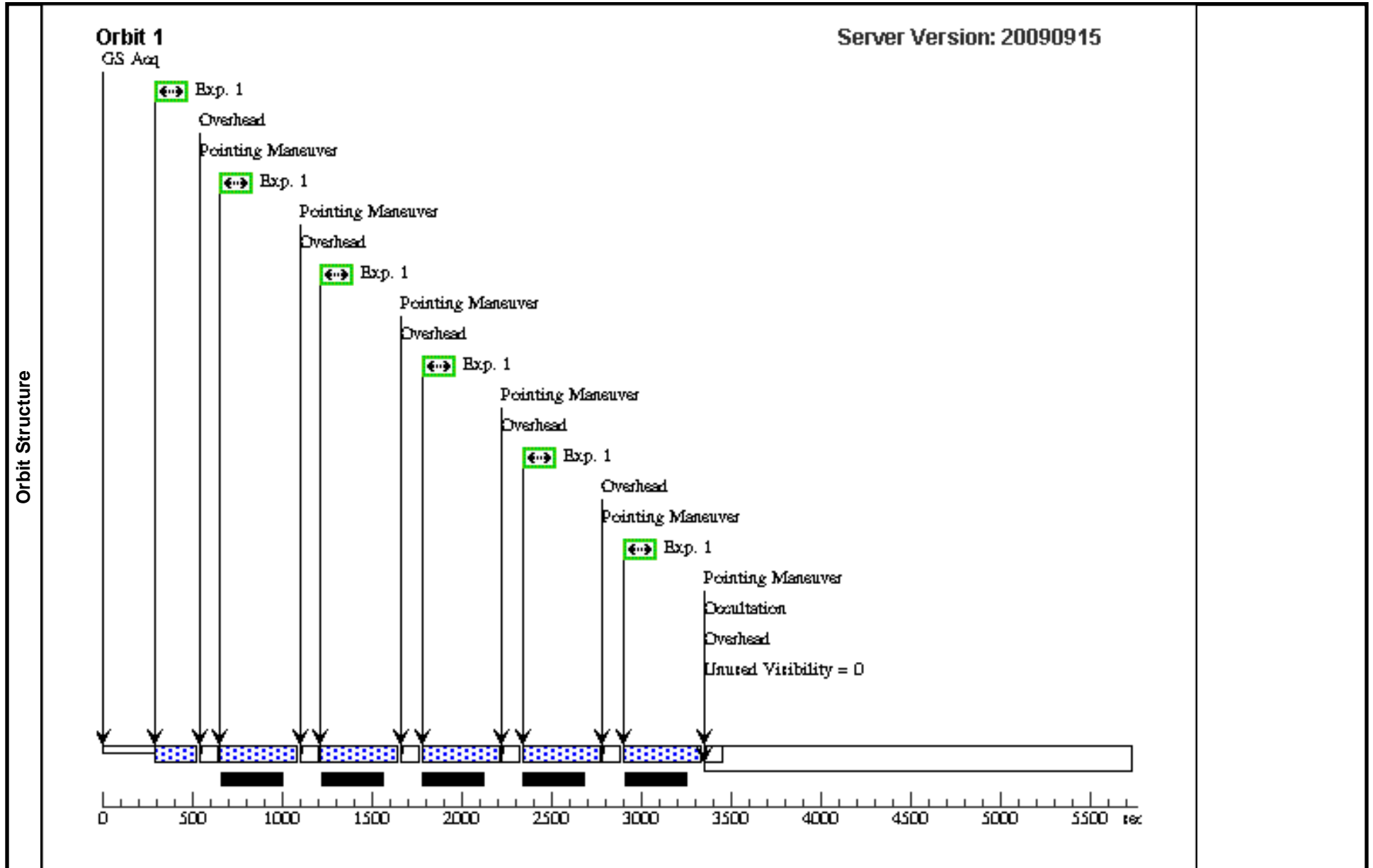
Proposal 11643 - Visit 08 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

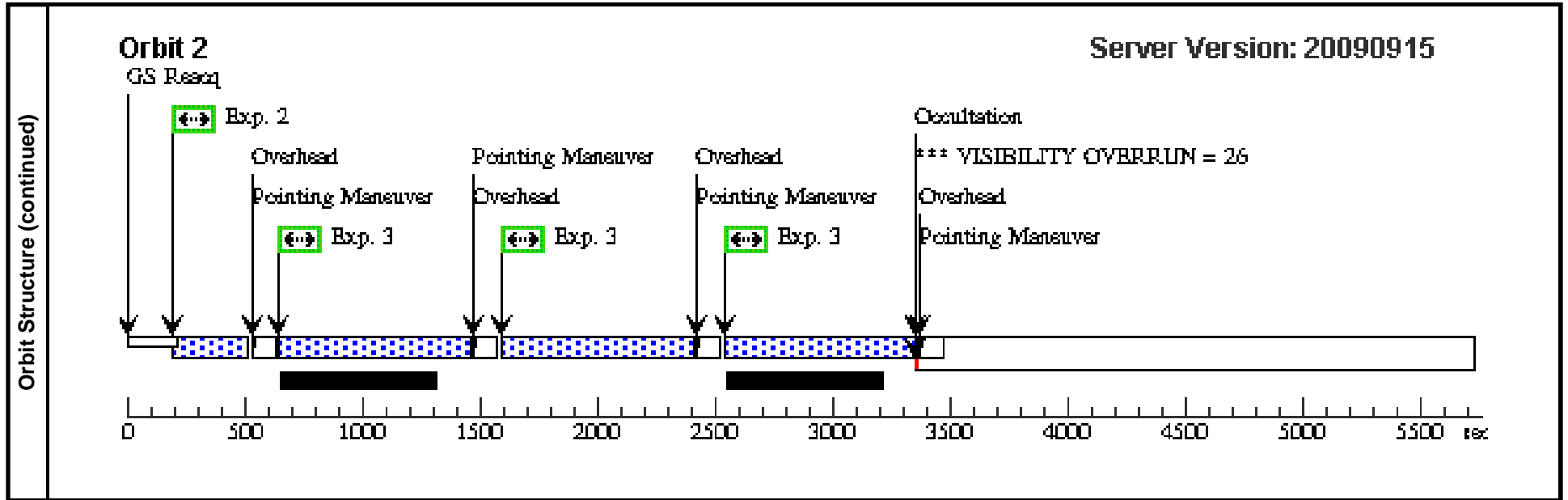
Thu Dec 10 02:24:07 GMT 2009

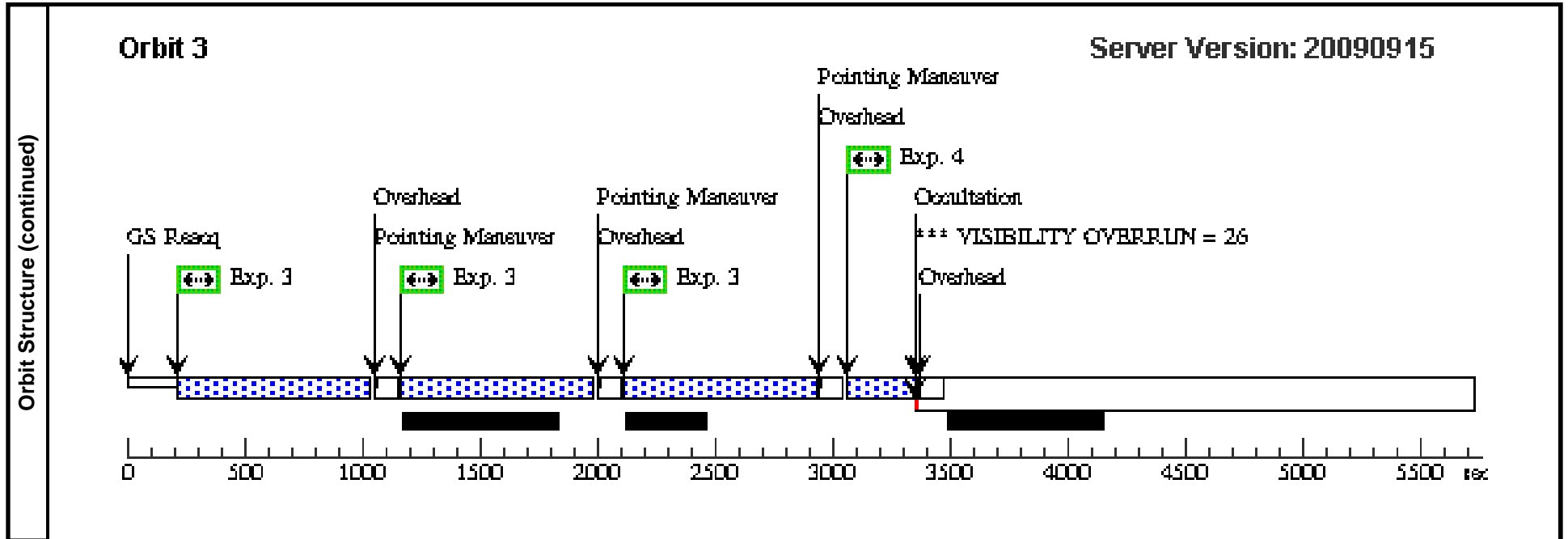
<b>Visit</b>	<b>Proposal 11643, Visit 08, scheduling</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 220D TO 320 D <i>Comments: We request minor orientation requirement to avoid a bright star in the same chip with our target galaxy.</i>									
	<b>Diagnostics</b>	(Visit 08) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 08) Warning (Orbit Planner): VISIBILITY OVERRUN (Exposure 1 (Pattern 1, Exps 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 3 (Pattern 1, Exps 3-3) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes								
<b>Patterns</b>		<b>#</b>	<b>Primary Pattern</b>		<b>Secondary Pattern</b>		<b>Exposures</b>			
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=3 Point Spacing=2.4 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.754 Angle Between Sides= Center Pattern=true	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.119 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=33.606 Angle Between Sides= Center Pattern=false	(1), (3)				
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(8)	SDSSJ162702.56+432833.9 Alt Name1: EA-SPITZER13	RA: 16 27 2.5600 (246.7606667d) Dec: +43 28 33.90 (43.47608d) Equinox: J2000	Redshift: 0.046	V=16.4	Reference Frame: ICRS				
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time/[Actual Dur.]</b>	<b>Orbit</b>
	1	(8) SDSSJ162702.56+432833.9	(8) SDSSJ162702.56+432833.9	WFC3/UVIS, ACCUM, UVIS	F625W	CR-SPLIT=NO	POS TARG 0,15; GS ACQ SCENARI O BASE1B3	Pattern 1, Exps 1-1 (1)	400 Secs [==>200 Secs (Pattern 1,1)] [==>434.0 Secs (Pattern 1,2)] [==>434.0 Secs (Pattern 2,1)] [==>434.0 Secs (Pattern 2,2)] [==>434.0 Secs (Pattern 3,1)] [==>434.0 Secs (Pattern 3,2)]	[1]
	2	(8) SDSSJ162702.56+432833.9	(8) SDSSJ162702.56+432833.9	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15		400 Secs [==>300 Secs ]	[2]

Proposal 11643 - Visit 08 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
		3		(8) SDSSJ162702.56 +432833.9	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG null,15	Pattern 1, Exps 3-3 (1)	400 Secs
[==>821.0 Secs (Pattern 1,1)]										
[==>821.0 Secs (Pattern 1,2)]										[2]
[==>821.0 Secs (Pattern 2,1)]										
[==>821.0 Secs (Pattern 2,2)]										
[==>821.0 Secs (Pattern 3,1)]	[3]									
								[==>821.0 Secs (Pattern 3,2)]		
	4		(8) SDSSJ162702.56 +432833.9	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15		400 Secs	
									[==>300.0 Secs ]	[3]







Proposal 11643 - Visit 09 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

Thu Dec 10 02:24:07 GMT 2009

<b>Visit</b>	<b>Proposal 11643, Visit 09, completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 310D TO 200 D <i>Comments: We request minor orientation requirement to include a companion galaxy.</i>									
	<b>Diagnosics</b> (Visit 09) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 09) Warning (Orbit Planner): VISIBILITY OVERRUN (Exposure 1 (Pattern 1, Exps 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 3 (Pattern 1, Exps 3-3) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>	<b>Secondary Pattern</b>	<b>Exposures</b>						
	(1)	Pattern Type=WFC3-UVIS-MOS- DITH-LINE Purpose=MOSAIC Number Of Points=3 Point Spacing=2.4 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.754 Angle Between Sides= Center Pattern=true	Pattern Type=WFC3-UVIS-MOS- DITH-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.119 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=33.606 Angle Between Sides= Center Pattern=false	(1), (3)				
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>				
	(9)	SDSSJ225506.80+005839.9 Alt Name1: EA-SPITZER15	RA: 22 55 6.8000 (343.7783333d) Dec: +00 58 39.90 (.97775d) Equinox: J2000	Redshift: 0.053	V=16.4	Reference Frame: ICRS				
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time/[Actual Dur.]</b>	<b>Orbit</b>
	1		(9) SDSSJ225506.80+005839.9	WFC3/UVIS, ACCUM, UVIS	F625W	CR-SPLIT=NO	POS TARG 0,15	Pattern 1, Exps 1-1 (1)	400 Secs [==>200 Secs (Pattern 1,1)] [==>411.0 Secs (Pattern 1,2)] [==>411.0 Secs (Pattern 2,1)] [==>411.0 Secs (Pattern 2,2)] [==>411.0 Secs (Pattern 3,1)] [==>411.0 Secs (Pattern 3,2)]	[1]
	2		(9) SDSSJ225506.80+005839.9	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15		400 Secs [==>300 Secs ]	[2]

Proposal 11643 - Visit 09 - A Timeline for Early-Type Galaxy Formation: Mapping the Evolution of Star Formation, Glob...

Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	3	(9) SDSSJ225506.80 +005839.9	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG null,15	Pattern 1, Exps 3-3 (1)	400 Secs	[=>783.0 Secs (Pattern 1,1)]	[2]
								[=>783.0 Secs (Pattern 1,2)]		
								[=>783.0 Secs (Pattern 2,1)]		
								[=>783.0 Secs (Pattern 2,2)]		
								[=>783.0 Secs (Pattern 3,1)]	[3]	
								[=>783.0 Secs (Pattern 3,2)]		
4	(9) SDSSJ225506.80 +005839.9	WFC3/UVIS, ACCUM, UVIS	F438W	CR-SPLIT=NO	POS TARG 0,15		400 Secs			
								[=>300.0 Secs ]	[3]	

