



11638 - Illuminating the HI Structure of a Proto-cluster Region at $z=2.84$

Cycle: 17, 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) Q1549-1	WFC3/UVIS	5	02-Jul-2008 22:02:41.0	yes
02	(1) Q1549-1	WFC3/UVIS	5	02-Jul-2008 22:02:50.0	yes
03	(1) Q1549-1	WFC3/UVIS	5	02-Jul-2008 22:03:01.0	yes
04	(1) Q1549-1	WFC3/UVIS	5	02-Jul-2008 22:03:09.0	yes
05	(1) Q1549-1	WFC3/UVIS	5	02-Jul-2008 22:03:16.0	yes
06	(1) Q1549-1	WFC3/UVIS	5	02-Jul-2008 22:03:27.0	yes

30 Total Orbits Used

ABSTRACT

We propose very deep intermediate-band Lyman alpha imaging in the field of a newly-discovered proto-cluster region surrounding the extremely luminous QSO HS1549+19 at $z=2.844$. The large structure, initially discovered in a spectroscopic survey of galaxies in fields surrounding the brightest QSOs at $z=2.5-2.8$, represents an ideal laboratory for studying the response of the intergalactic medium to a source of ionizing photons that exceeds the UV background by factors >1000 . Within a single pointing of WFC3-UVIS there are already more than 45 known Lyman alpha emitters, most of which are already spectroscopically confirmed, and at least 3 of which are giant "Lyman alpha blobs". Many of the objects have properties similar to those expected from the process of fluorescence, in which Lyman alpha emission is induced by the UV radiation field of the QSO in any HI gas that dense enough to remain partially self-shielded. Fortunately, the F467M filter (Stromgren "b") in WFC3-UVIS is a perfect match to Lyman alpha at $z=2.844$. In combination with an equally deep broad-band continuum image, the observations will allow the construction of a Lyman alpha map tracing dense gas throughout the inner parts of a proto-cluster region at sub-kpc resolution. The ability to measure the spatial sub-structure and surface brightness distribution of Ly α emission, relative to known protocluster galaxies and AGN, will illuminate the "cosmic web" in a dense region caught in a violent stage of formation.

OBSERVING DESCRIPTION

We are proposing to obtain a total of 6 orbits WFC3/UVIS observations in the F475W filter, and a total of 24 orbits in F467M, in a single field. The program has been split into 6 visits of 5 orbits each, where one orbit is used for F475W and 4 orbits are used for F467M in each visit. The objective is to obtain the same sky coverage for the resulting mosaic while allowing for flexible scheduling- 2 30 degree "ORIENT" ranges have been specified for Visit 1, with Visits 2-6 constrained to have the same ORIENT. The "WFC3-UVIS-MOS-DITH-LINE" pattern has been used to obtain coverage across the gap between the CCDs, but otherwise the point is to maintain the largest area receiving full integration time in each filter. We anticipate using the "multidrizzle" routines for removing cosmic rays and hot pixels. We have made the F467M exposures as long as recommended (half-orbit each), since detector read noise is non-negligible, and to minimize overhead. POS TARG have been used for each of visits 2-6 in order to place the gap between the detectors at slightly different positions for each visit; the same offset is applied to each pattern in a given visit.

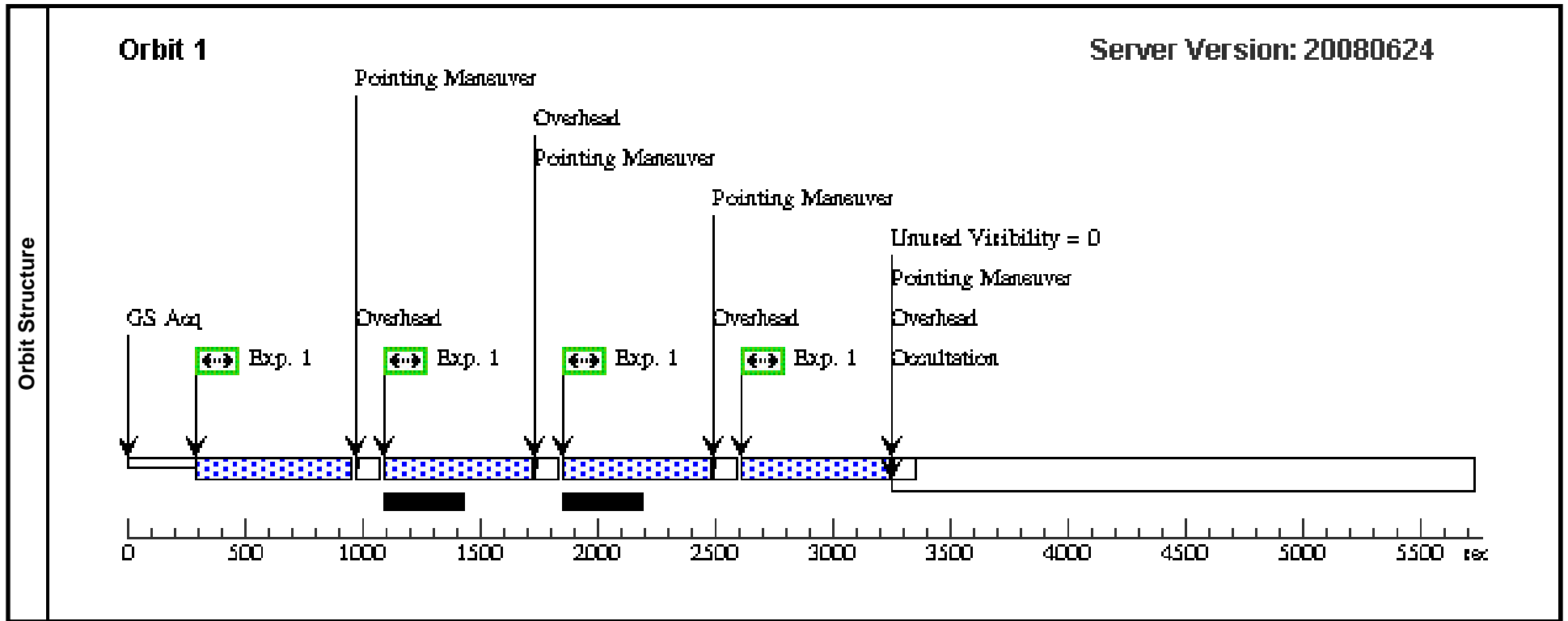
REAL TIME JUSTIFICATION

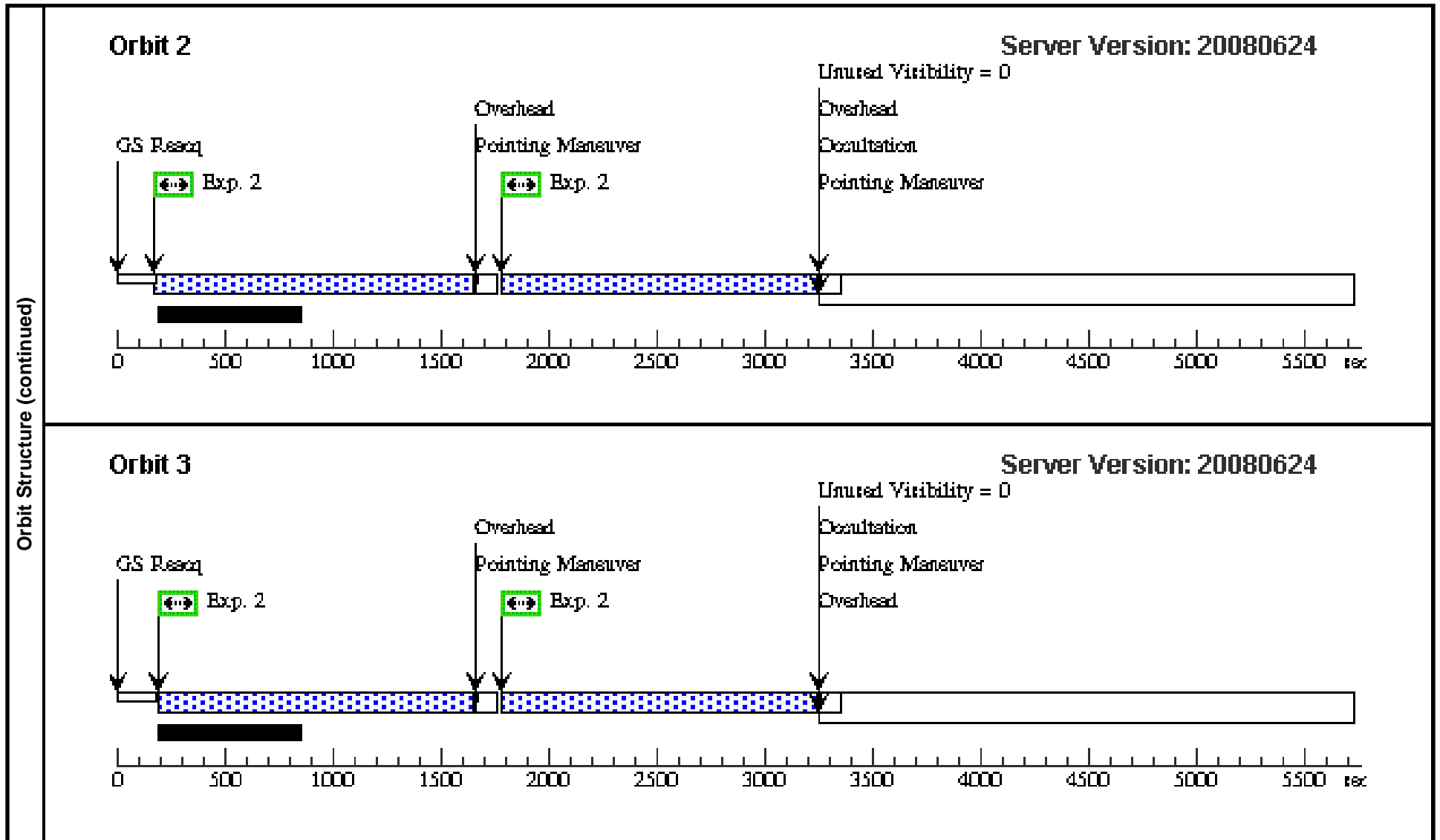
None.

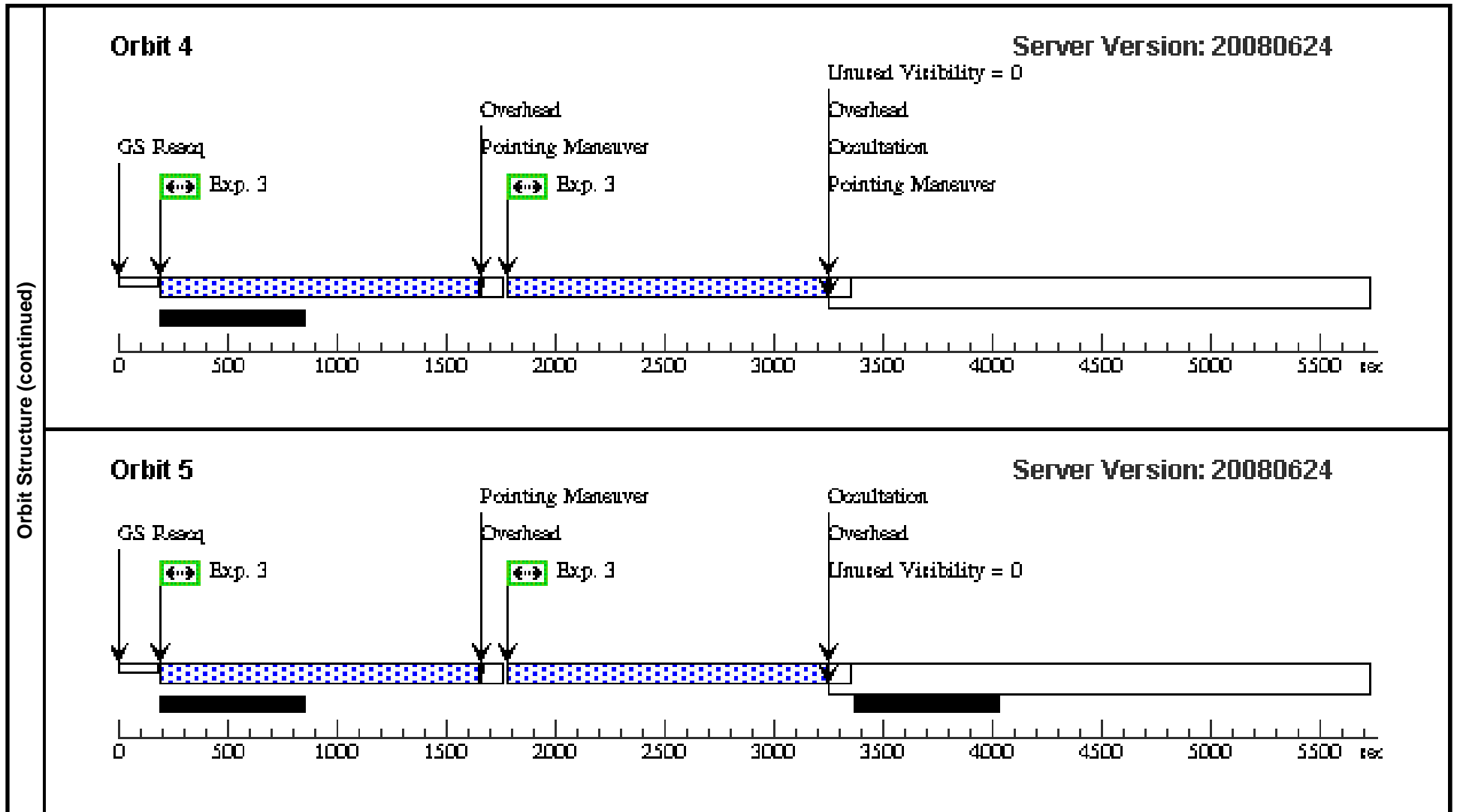
Proposal 11638 - Visit 01 - Illuminating the HI Structure of a Proto-cluster Region at z=2.84

Thu Jul 03 02:03:32 GMT 2008

Visit	Proposal 11638, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 250D TO 280 D; ORIENT 70D TO 100 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=2 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), (3)			
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	Q1549-1 Alt Name1: HS-1549+1919	RA: 15 51 52.4803 (237.9686679d) Dec: +19 11 4.21 (19.18450d) Equinox: J2000		V=15.5+/-0.2	Reference Frame: ICRS				
<i>Comments: This object was generated by the targetselector and retrieved from the 2MASS database. It is a QSO, with V~15.5.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	CR-SPLIT=NO		Pattern 1-1 (1)	600 Secs [==>633.0 Secs (Pattern 1,1)] [==>633.0 Secs (Pattern 1,2)] [==>633.0 Secs (Pattern 2,1)] [==>633.0 Secs (Pattern 2,2)]	[1]
2		(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO		Pattern 2-2 (1)	1400 Secs [==>1463.0 Secs (Pattern 1,1)] [==>1463.0 Secs (Pattern 1,2)] [==>1463.0 Secs (Pattern 2,1)] [==>1463.0 Secs (Pattern 2,2)]	[2]	
3		(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO		Pattern 3-3 (1)	1400 Secs [==>1463.0 Secs (Pattern 1,1)] [==>1463.0 Secs (Pattern 1,2)] [==>1463.0 Secs (Pattern 2,1)] [==>1463.0 Secs (Pattern 2,2)]	[4]	
									[==>1463.0 Secs (Pattern 2,2)] [==>1463.0 Secs (Pattern 2,2)]	[5]



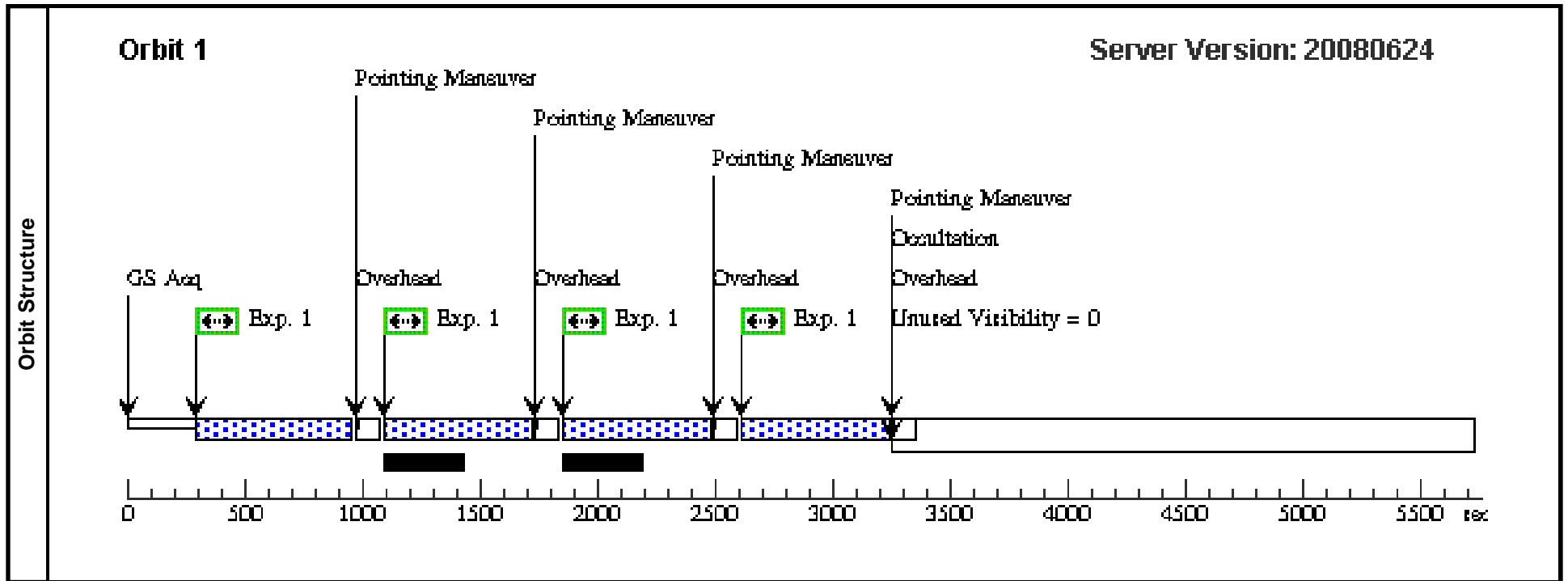


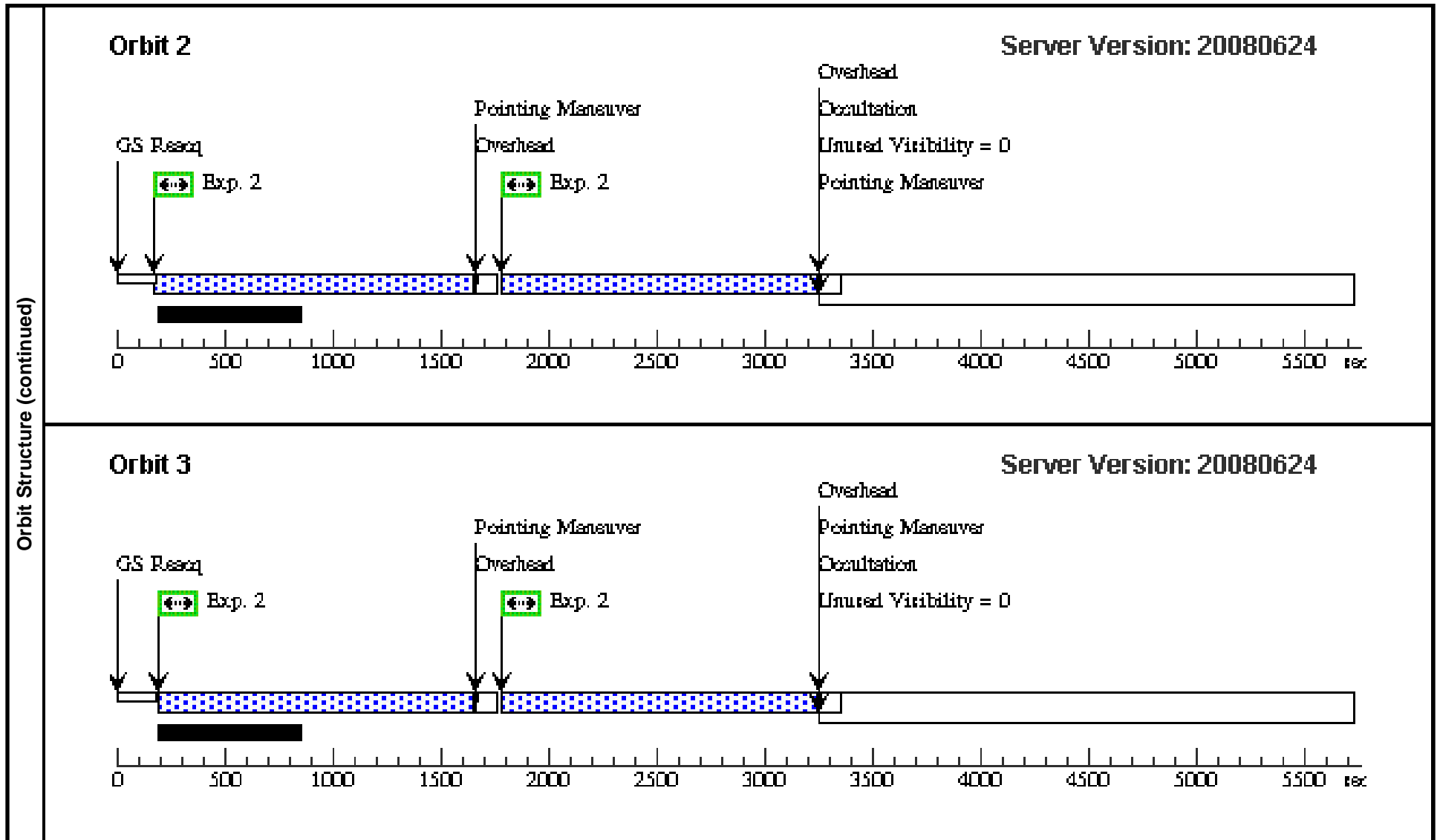


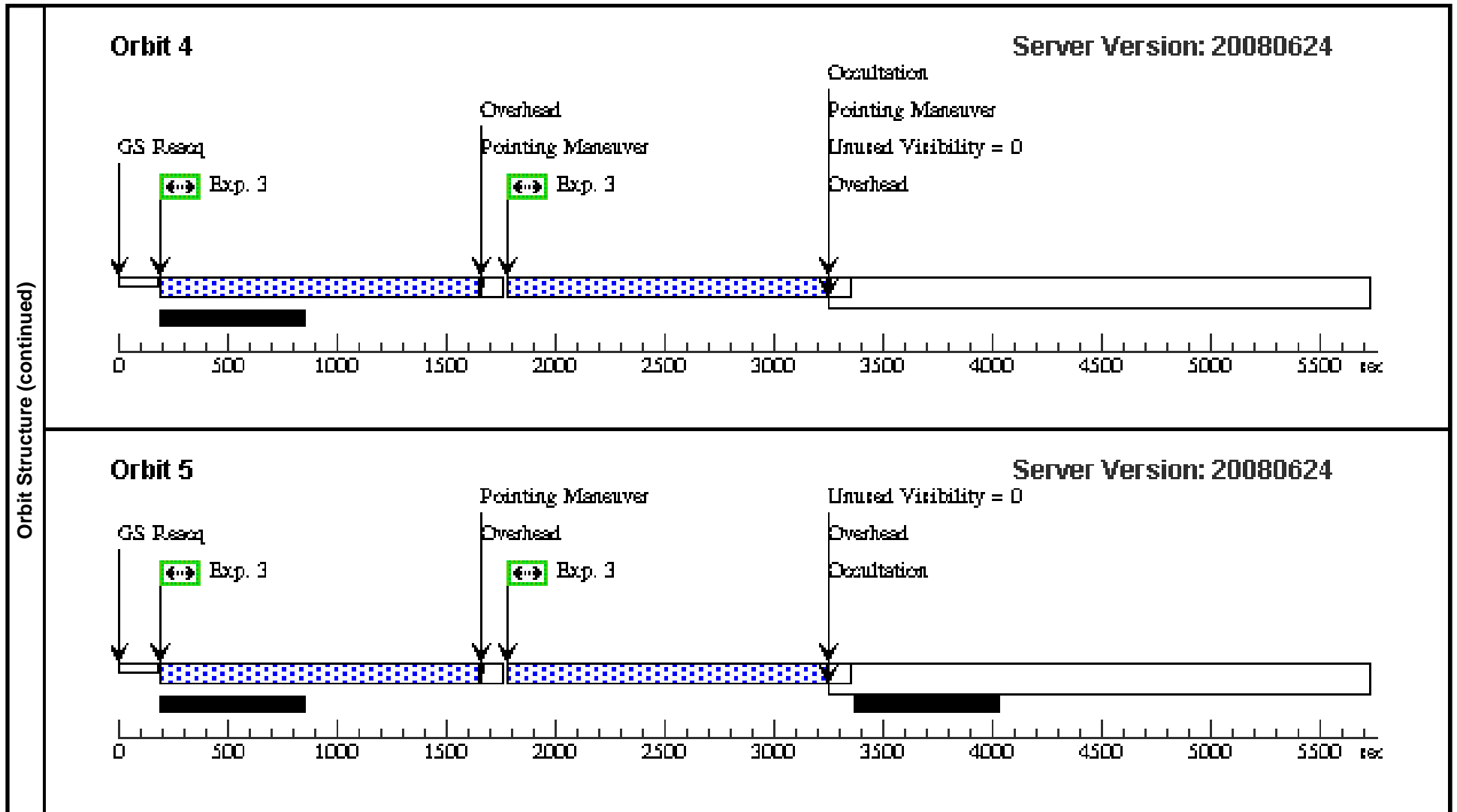
Proposal 11638 - Visit 02 - Illuminating the HI Structure of a Proto-cluster Region at z=2.84

Thu Jul 03 02:03:33 GMT 2008

Visit	Proposal 11638, Visit 02 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: SAME ORIENT AS 01										
	Diagnostics	(Exposure 1 (Pattern 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 2 (Pattern 2-2) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 3 (Pattern 3-3) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
Patterns		#	Primary Pattern				Secondary Pattern				Exposures
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=2 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), (3)					
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(1)	Q1549-1 Alt Name1: HS-1549+1919	RA: 15 51 52.4803 (237.9686679d) Dec: +19 11 4.21 (19.18450d) Equinox: J2000					V=15.5+/-0.2	Reference Frame: ICRS		
<i>Comments: This object was generated by the targetselector and retrieved from the 2MASS database. It is a QSO, with V~15.5.</i>											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	CR-SPLIT=NO	POS TARG 0.356,4. 786	Pattern 1-1 (1)	600 Secs		
										[==>633.0 Secs (Pattern 1,1)]	[1]
										[==>633.0 Secs (Pattern 1,2)]	
										[==>633.0 Secs (Pattern 2,1)]	
										[==>633.0 Secs (Pattern 2,2)]	
	2	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO	POS TARG 0.356,4. 786	Pattern 2-2 (1)	1400 Secs		
									[==>1463.0 Secs (Pattern 1,1)]	[2]	
									[==>1463.0 Secs (Pattern 1,2)]		
									[==>1463.0 Secs (Pattern 2,1)]		
									[==>1463.0 Secs (Pattern 2,2)]		
3	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO	POS TARG 0.356,4. 786	Pattern 3-3 (1)	1400 Secs			
									[==>1463.0 Secs (Pattern 1,1)]	[4]	
									[==>1463.0 Secs (Pattern 1,2)]		
									[==>1463.0 Secs (Pattern 2,1)]		
									[==>1463.0 Secs (Pattern 2,2)]		



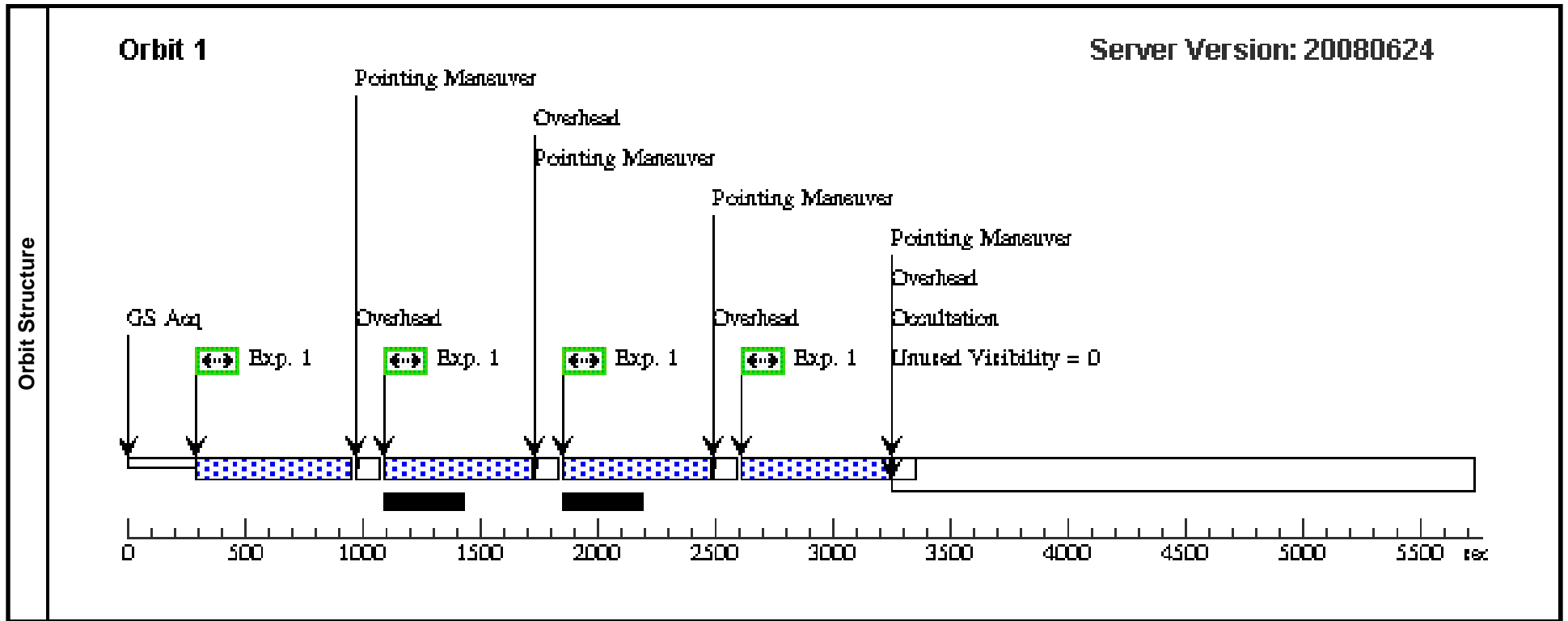


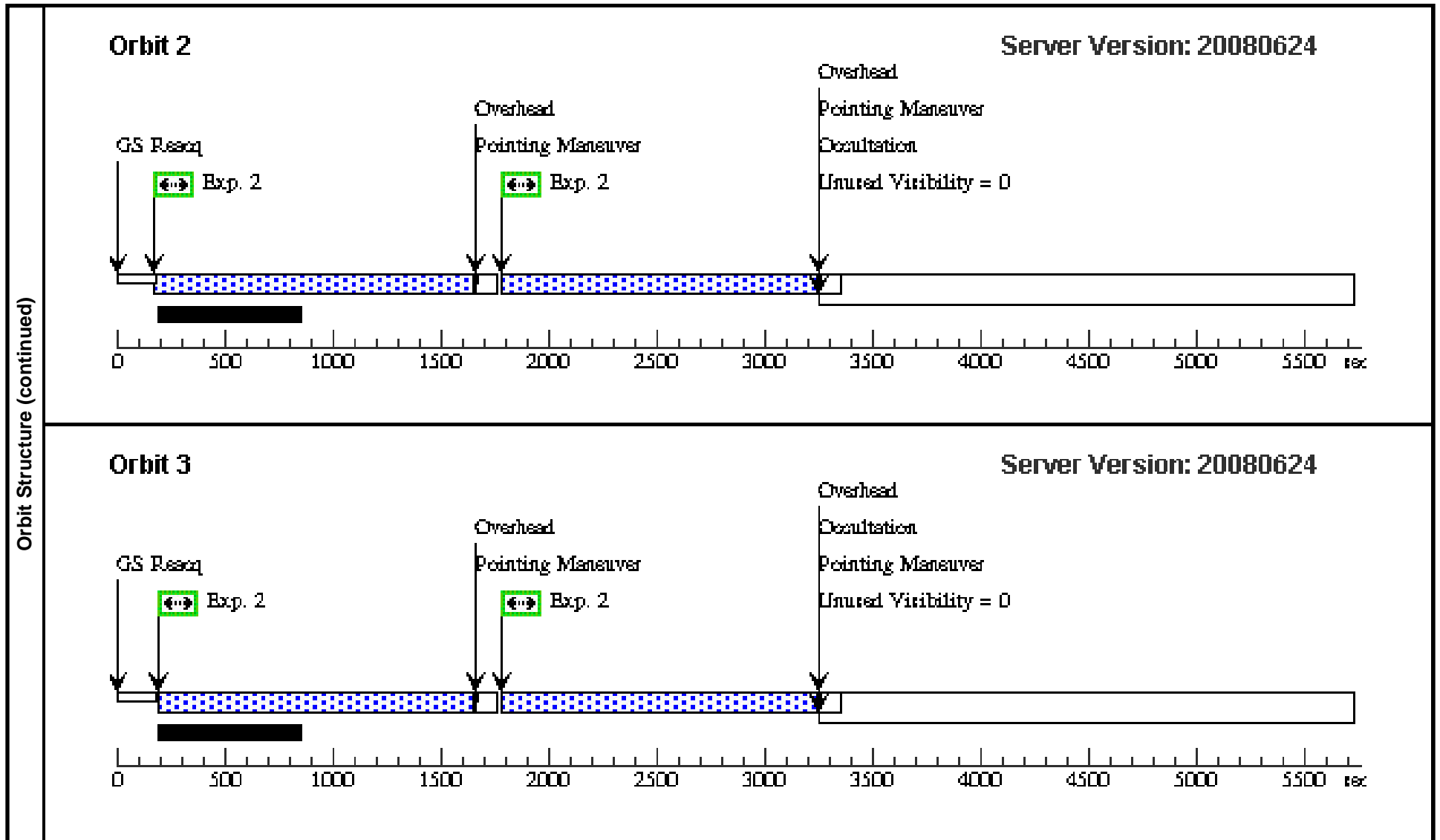


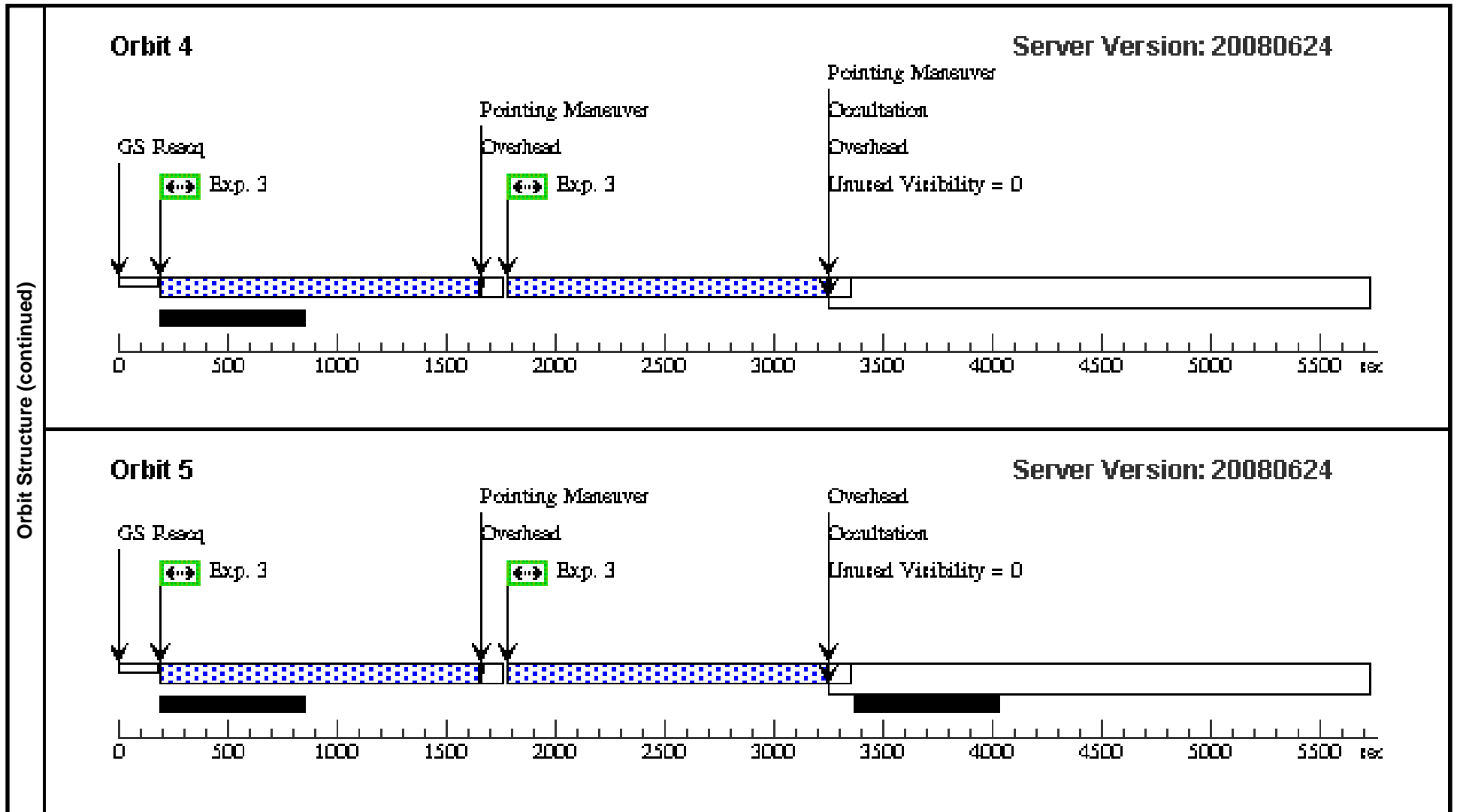
Proposal 11638 - Visit 03 - Illuminating the HI Structure of a Proto-cluster Region at z=2.84

Thu Jul 03 02:03:34 GMT 2008

Visit	Proposal 11638, Visit 03 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: SAME ORIENT AS 01										
	Diagnostics	(Exposure 1 (Pattern 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 2 (Pattern 2-2) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 3 (Pattern 3-3) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
Patterns		#	Primary Pattern				Secondary Pattern				Exposures
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=2 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), (3)					
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(1)	Q1549-1 Alt Name1: HS-1549+1919	RA: 15 51 52.4803 (237.9686679d) Dec: +19 11 4.21 (19.18450d) Equinox: J2000				V=15.5+/-0.2	Reference Frame: ICRS			
<i>Comments: This object was generated by the targetselector and retrieved from the 2MASS database. It is a QSO, with V~15.5.</i>											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	CR-SPLIT=NO	POS TARG -0.356,- 4.786	Pattern 1-1 (1)	600 Secs		
										[==>633.0 Secs (Pattern 1,1)]	[1]
										[==>633.0 Secs (Pattern 1,2)]	
										[==>633.0 Secs (Pattern 2,1)]	
										[==>633.0 Secs (Pattern 2,2)]	
	2	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO	POS TARG -0.356,- 4.786	Pattern 2-2 (1)	1400 Secs		
									[==>1463.0 Secs (Pattern 1,1)]	[2]	
									[==>1463.0 Secs (Pattern 1,2)]		
									[==>1463.0 Secs (Pattern 2,1)]		
									[==>1463.0 Secs (Pattern 2,2)]		
3	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO	POS TARG -0.356,- 4.786	Pattern 3-3 (1)	1400 Secs			
									[==>1463.0 Secs (Pattern 1,1)]	[4]	
									[==>1463.0 Secs (Pattern 1,2)]		
									[==>1463.0 Secs (Pattern 2,1)]		
									[==>1463.0 Secs (Pattern 2,2)]		



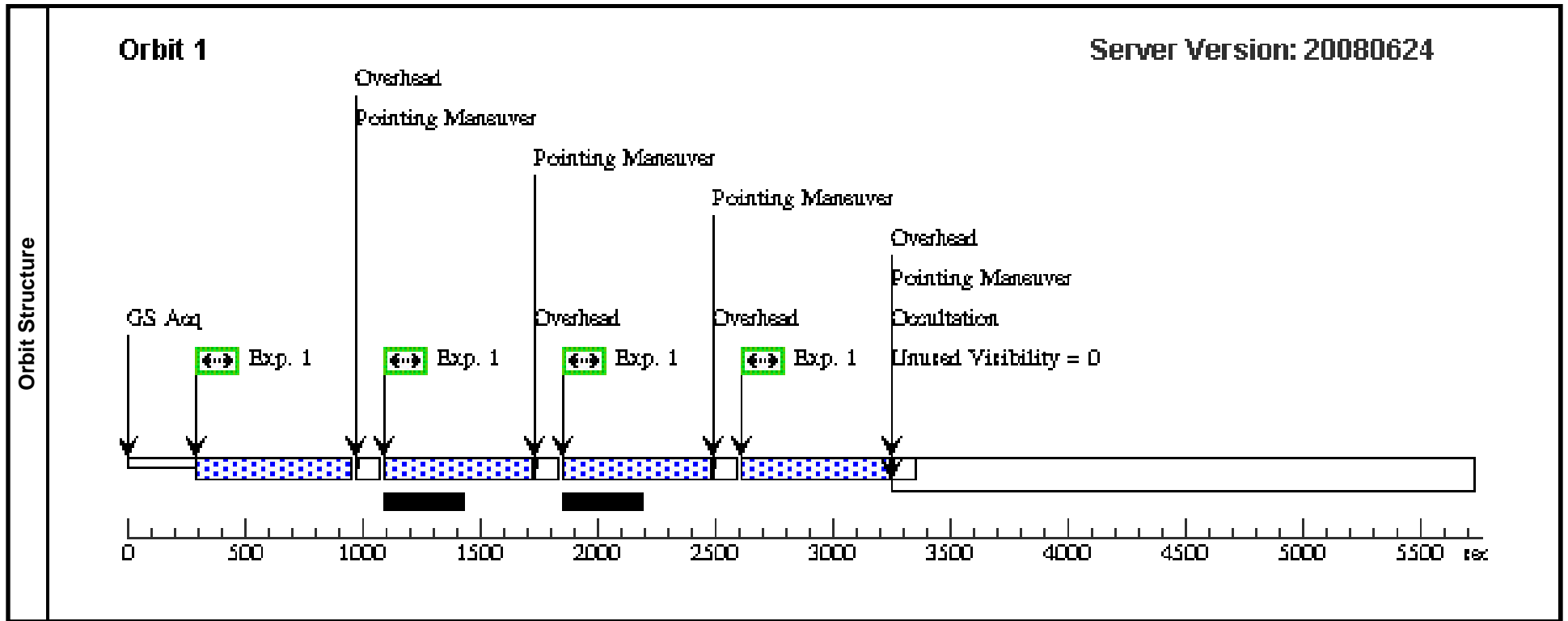


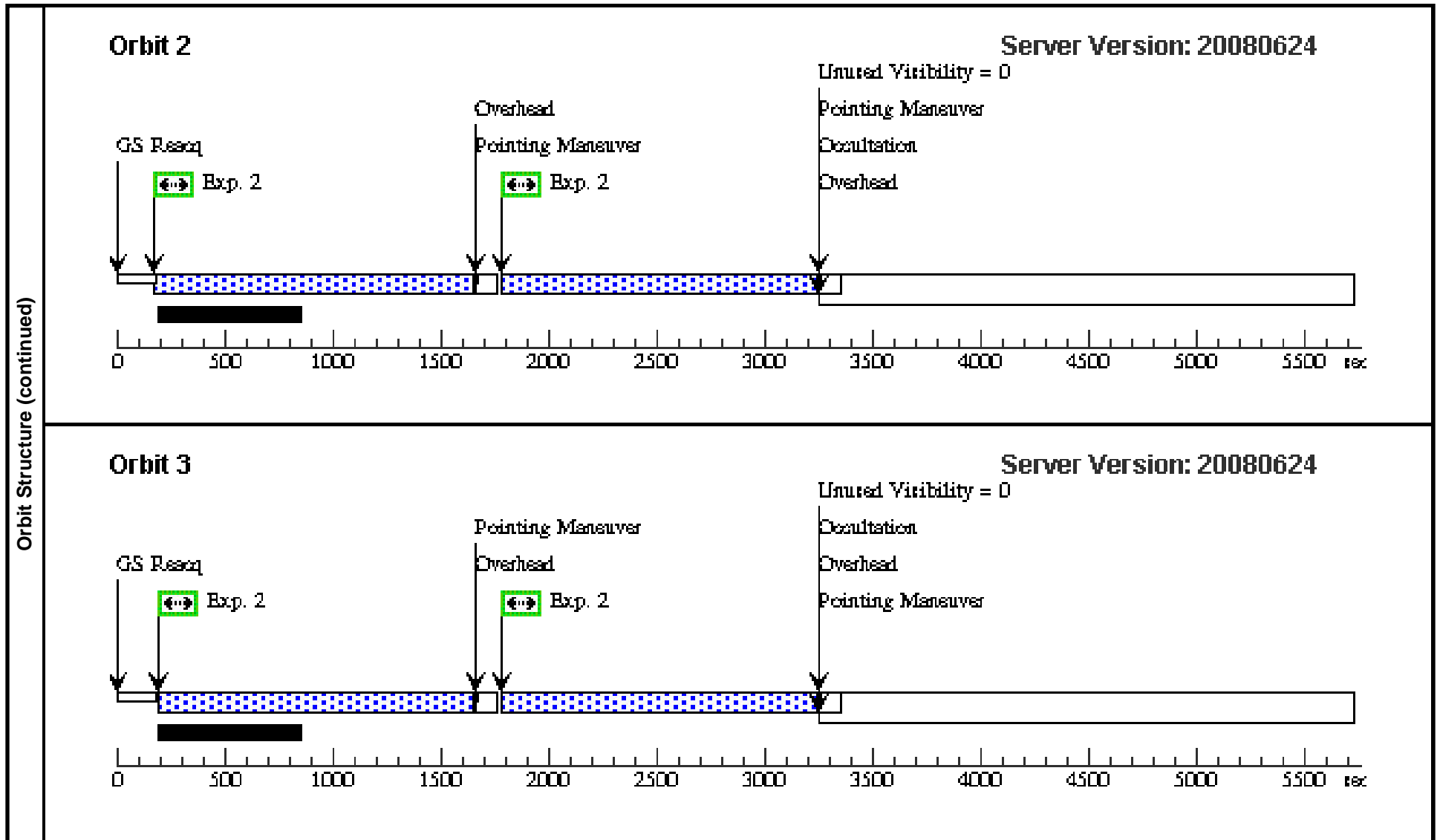


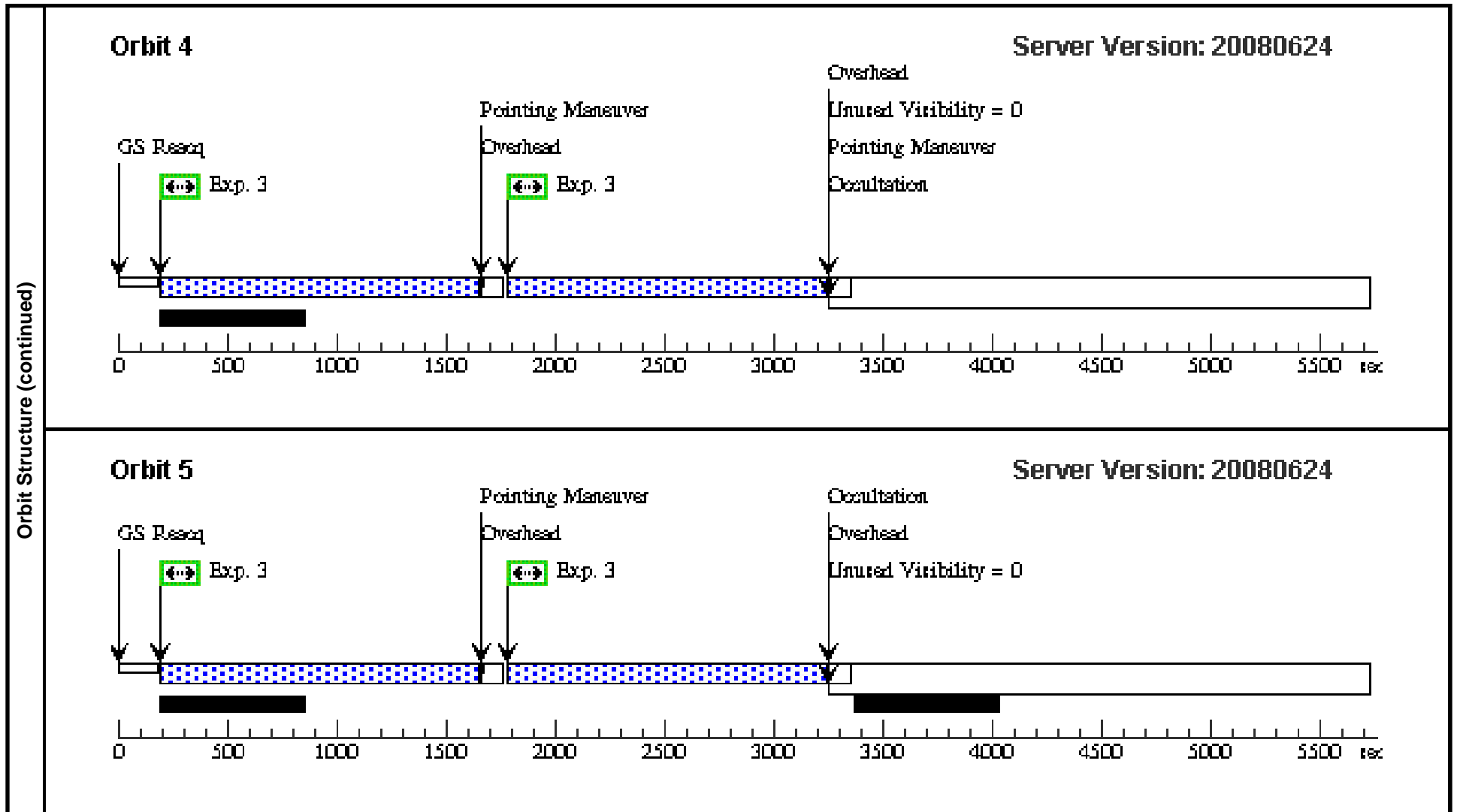
Proposal 11638 - Visit 04 - Illuminating the HI Structure of a Proto-cluster Region at z=2.84

Thu Jul 03 02:03:35 GMT 2008

Visit	Proposal 11638, Visit 04 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: SAME ORIENT AS 01									
	Diagnosics (Exposure 1 (Pattern 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 2 (Pattern 2-2) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 3 (Pattern 3-3) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
Patterns	#	Primary Pattern		Secondary Pattern		Exposures				
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=2 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), (3)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	Q1549-1 Alt Name1: HS-1549+1919	RA: 15 51 52.4803 (237.9686679d) Dec: +19 11 4.21 (19.18450d) Equinox: J2000		V=15.5+/-0.2	Reference Frame: ICRS				
<i>Comments: This object was generated by the targetselector and retrieved from the 2MASS database. It is a QSO, with V~15.5.</i>										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	CR-SPLIT=NO	POS TARG 0.178,2.393	Pattern 1-1 (1)	600 Secs	
									[==>633.0 Secs (Pattern 1,1)]	[1]
									[==>633.0 Secs (Pattern 1,2)]	
									[==>633.0 Secs (Pattern 2,1)]	
									[==>633.0 Secs (Pattern 2,2)]	
	2	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO	POS TARG 0.178,2.393	Pattern 2-2 (1)	1400 Secs	
								[==>1463.0 Secs (Pattern 1,1)]	[2]	
								[==>1463.0 Secs (Pattern 1,2)]		
								[==>1463.0 Secs (Pattern 2,1)]	[3]	
								[==>1463.0 Secs (Pattern 2,2)]		
3	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO	POS TARG 0.178,2.393	Pattern 3-3 (1)	1400 Secs		
								[==>1463.0 Secs (Pattern 1,1)]	[4]	
								[==>1463.0 Secs (Pattern 1,2)]		
								[==>1463.0 Secs (Pattern 2,1)]	[5]	
								[==>1463.0 Secs (Pattern 2,2)]		



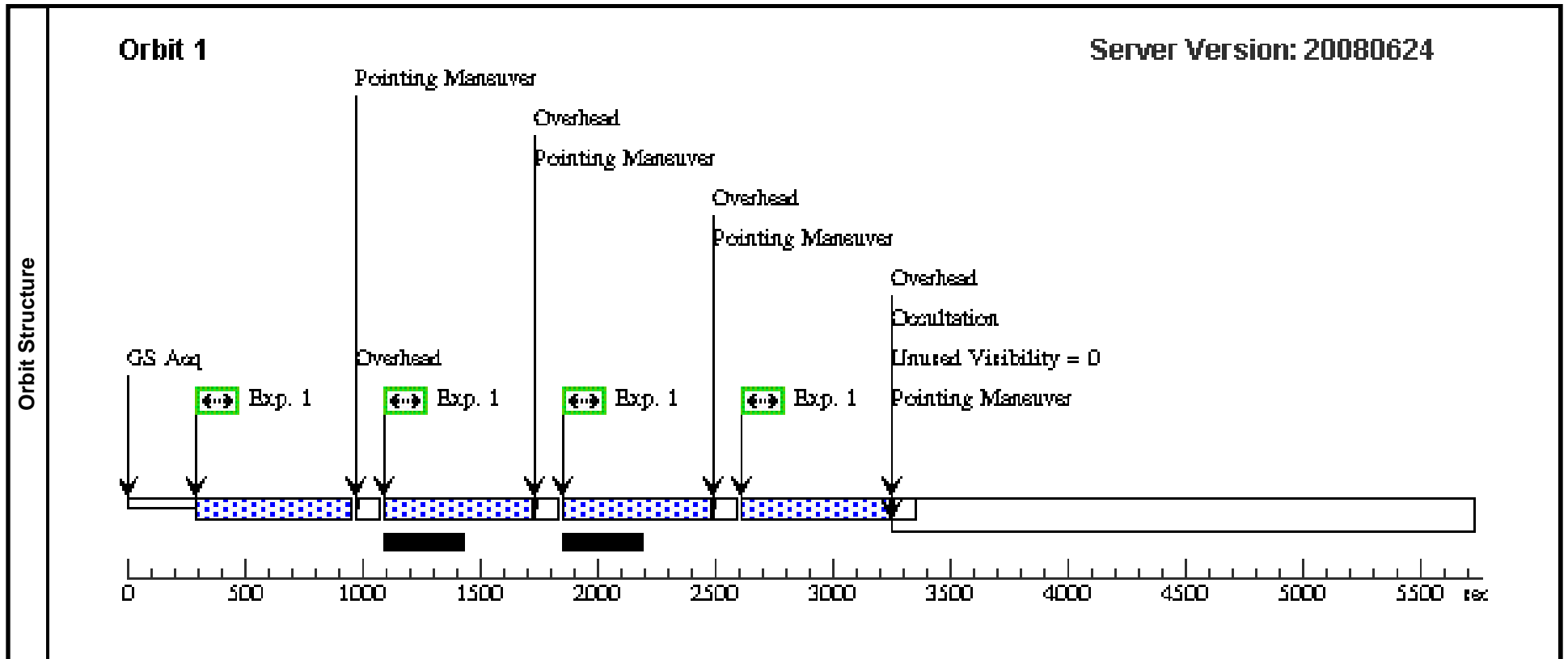


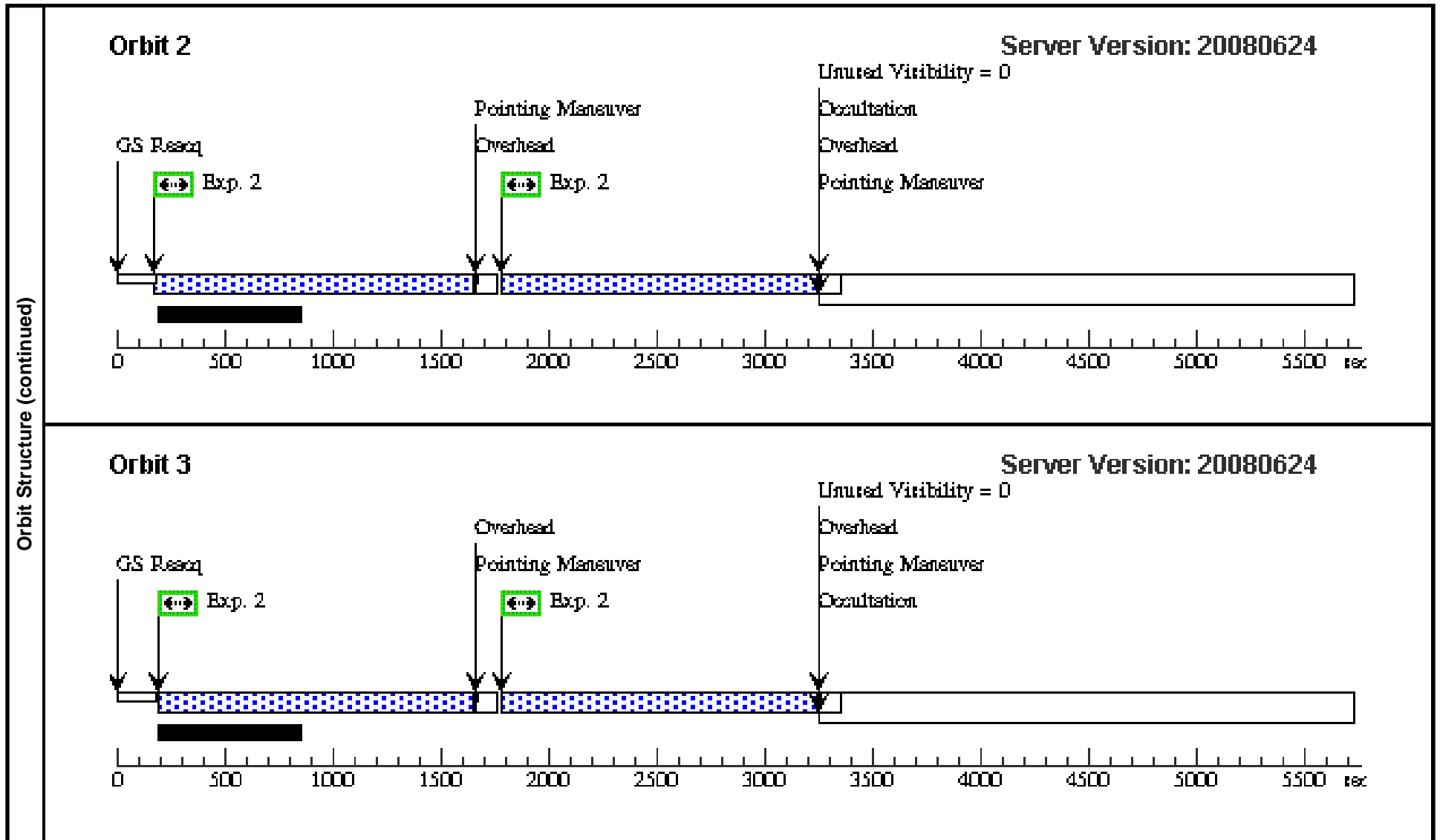


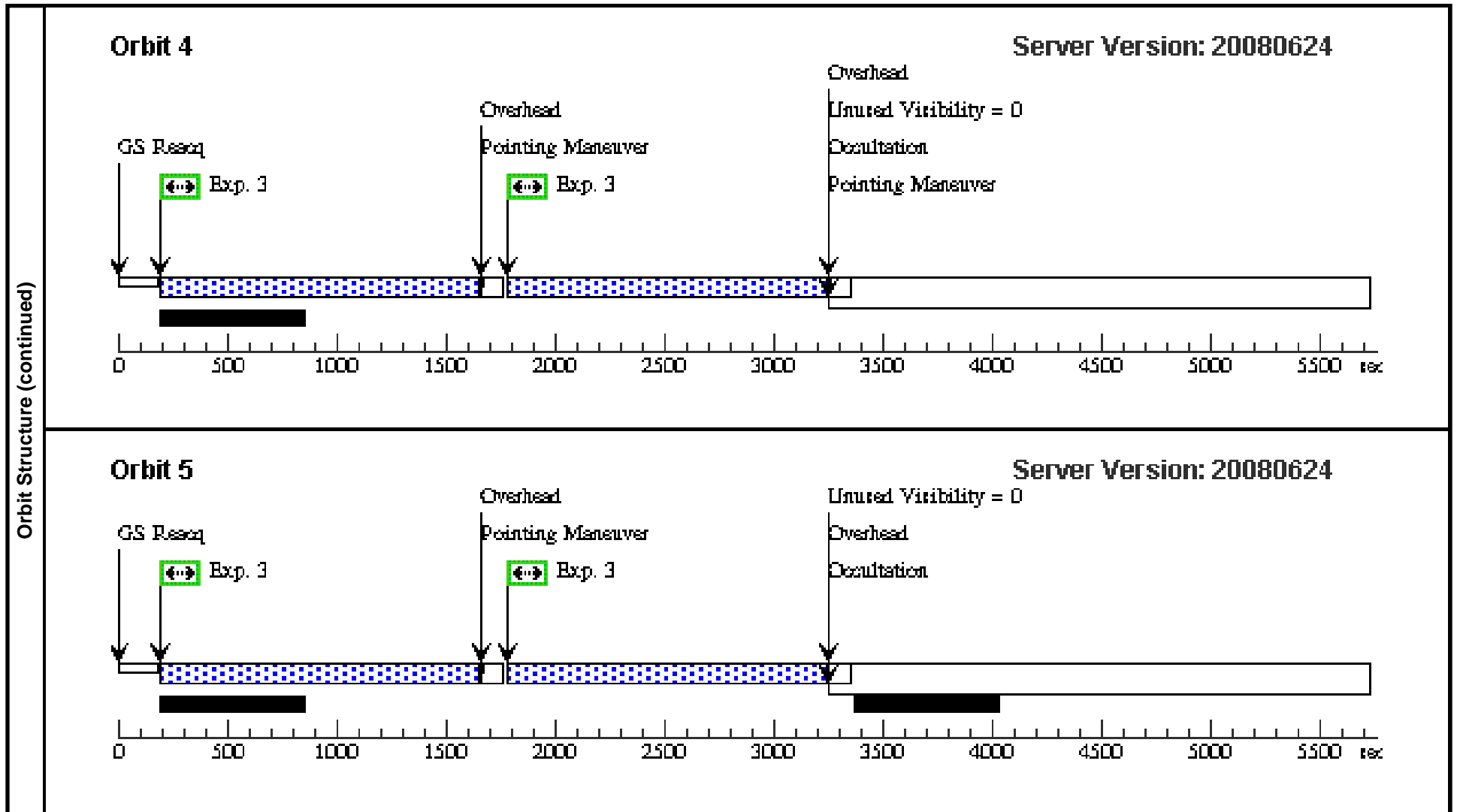
Proposal 11638 - Visit 05 - Illuminating the HI Structure of a Proto-cluster Region at z=2.84

Thu Jul 03 02:03:36 GMT 2008

Visit	Proposal 11638, Visit 05 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: SAME ORIENT AS 01										
	Diagnostics	(Exposure 1 (Pattern 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 2 (Pattern 2-2) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 3 (Pattern 3-3) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
Patterns		#	Primary Pattern				Secondary Pattern				Exposures
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=2 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), (3)					
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(1)	Q1549-1 Alt Name1: HS-1549+1919	RA: 15 51 52.4803 (237.9686679d) Dec: +19 11 4.21 (19.18450d) Equinox: J2000				V=15.5+/-0.2	Reference Frame: ICRS			
<i>Comments: This object was generated by the targetselector and retrieved from the 2MASS database. It is a QSO, with V~15.5.</i>											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	CR-SPLIT=NO	POS TARG -0.178,- 2.393	Pattern 1-1 (1)	600 Secs		
										[==>633.0 Secs (Pattern 1,1)]	[1]
										[==>633.0 Secs (Pattern 1,2)]	
										[==>633.0 Secs (Pattern 2,1)]	
										[==>633.0 Secs (Pattern 2,2)]	
	2	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO	POS TARG -0.178,- 2.393	Pattern 2-2 (1)	1400 Secs		
									[==>1463.0 Secs (Pattern 1,1)]	[2]	
									[==>1463.0 Secs (Pattern 1,2)]		
									[==>1463.0 Secs (Pattern 2,1)]		
									[==>1463.0 Secs (Pattern 2,2)]		
3	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO	POS TARG -0.178,- 2.393	Pattern 3-3 (1)	1400 Secs			
									[==>1463.0 Secs (Pattern 1,1)]	[4]	
									[==>1463.0 Secs (Pattern 1,2)]		
									[==>1463.0 Secs (Pattern 2,1)]		
									[==>1463.0 Secs (Pattern 2,2)]		







Visit	Proposal 11638, Visit 06 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: SAME ORIENT AS 01										
	Diagnostics	(Exposure 1 (Pattern 1-1) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 2 (Pattern 2-2) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 3 (Pattern 3-3) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
Patterns		#	Primary Pattern				Secondary Pattern				Exposures
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=2 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), (3)					
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous			
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<i>Comments: This object was generated by the targetselector and retrieved from the 2MASS database. It is a QSO, with V~15.5.</i>											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	CR-SPLIT=NO	POS TARG -0.267,- 3.590	Pattern 1-1 (1)	600 Secs		
										[==>633.0 Secs (Pattern 1,1)]	[1]
										[==>633.0 Secs (Pattern 1,2)]	
										[==>633.0 Secs (Pattern 2,1)]	
										[==>633.0 Secs (Pattern 2,2)]	
	2	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO	POS TARG -0.267,- 3.590	Pattern 2-2 (1)	1400 Secs		
									[==>1463.0 Secs (Pattern 1,1)]	[2]	
									[==>1463.0 Secs (Pattern 1,2)]		
									[==>1463.0 Secs (Pattern 2,1)]		
									[==>1463.0 Secs (Pattern 2,2)]		
3	(1) Q1549-1	(1) Q1549-1	WFC3/UVIS, ACCUM, UVIS-CENTER	F467M	CR-SPLIT=NO	POS TARG -0.267,- 3.590	Pattern 3-3 (1)	1400 Secs			
									[==>1463.0 Secs (Pattern 1,1)]	[4]	
									[==>1463.0 Secs (Pattern 1,2)]		
									[==>1463.0 Secs (Pattern 2,1)]		
									[==>1463.0 Secs (Pattern 2,2)]		

