11146 - The Role of Stellar Feedback in Galaxy Evolution

Cycle: 16, 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) HE2-10	WFPC2	4	17-Jan-2008 22:22:29.0	yes
02	(1) HE2-10	WFPC2	4	17-Jan-2008 22:22:38.0	yes
A2	(1) HE2-10	WFPC2	1	17-Jan-2008 22:22:42.0	yes

9 Total Orbits Used

ABSTRACT

Stellar feedback - the return of mass and energy from star formation to the interstellar medium - is one of the primary engines of galaxy evolution. Yet, the observational canvass of feedback is incomplete. We propose to investigate this fundamental aspect of star formation on one local actively star-forming galaxy, He2-10, selected to occupy an unexplored niche in the key parameter space of stellar mass. The WFPC2 narrow-band observations in the light of H-beta, [OIII], H-alpha, and [SII] will: (1) discriminate the feedback-induced shock fronts from the photoionized regions; (2) map, and provide a complete census of, the shocks inside and around the starburst regions; and (3) measure the energy budget of the star-formation-produced shocks. These observations, joined by our previous data and studies on starbursts, will yield: (1) the efficiency of the feedback, i.e. the fraction of the star formation's mechanical energy transported out of the starburst volume rather than radiated away, in the dual-parameter space of host's stellar mass and star formation intensity; (2) the conditions under which feedback morphs from a localized process to a galactic scale mechanism. The high angular resolution of HST is crucial for separating the spatially narrow shock fronts (~10 pc=0.2" at 10 Mpc) from the more extended photoionization fronts. This project will provide the most comprehensive quantitative foundation of stellar feedback and a gauge for determining the role of feedback in the energetics, structure and star formation history of galaxies.

OBSERVING DESCRIPTION

WFPC2 F487N, F502N, F658N, and F673N narrow-band images, centered on the emission lines H-beta, [OIII], H-alpha, and [SII] doublet, together with medium/broad band images in F547M and F814W for probing the underlying stellar continuum, will be obtained for the starburst galaxy Henize 2-10. The images will be centered in the WF3 chip, which can accomodate the entire starburst region plus surrounding areas. 4 dithered images, using the WFPC2-BOX pattern, will be obtained in each filter, for cosmic ray and hot pixel removal.

Total exposure times will be: 920 sec in F547M, 640 sec in F814W, 4400 sec in F487N, 5200 sec in F502N, 2000 sec in F658N, and 3200 sec in F673N.

Visit

Proposal 11146, Visit 01, scheduling Fri Jan 18 03:22:45 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1-3)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=false		
	Line Spacing=0.559017			

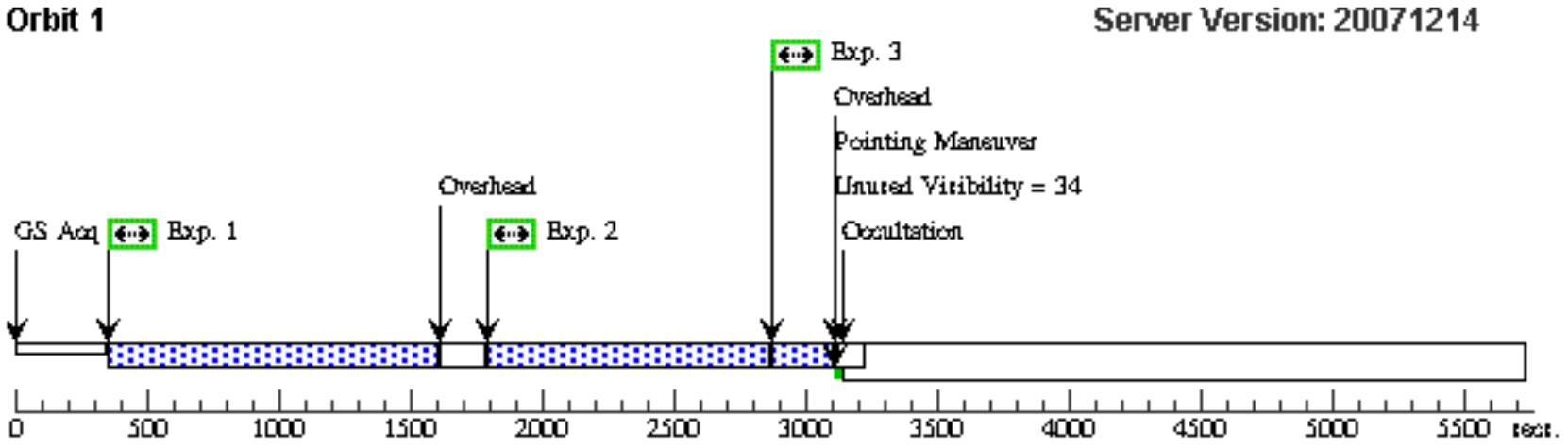
Fixed Targets

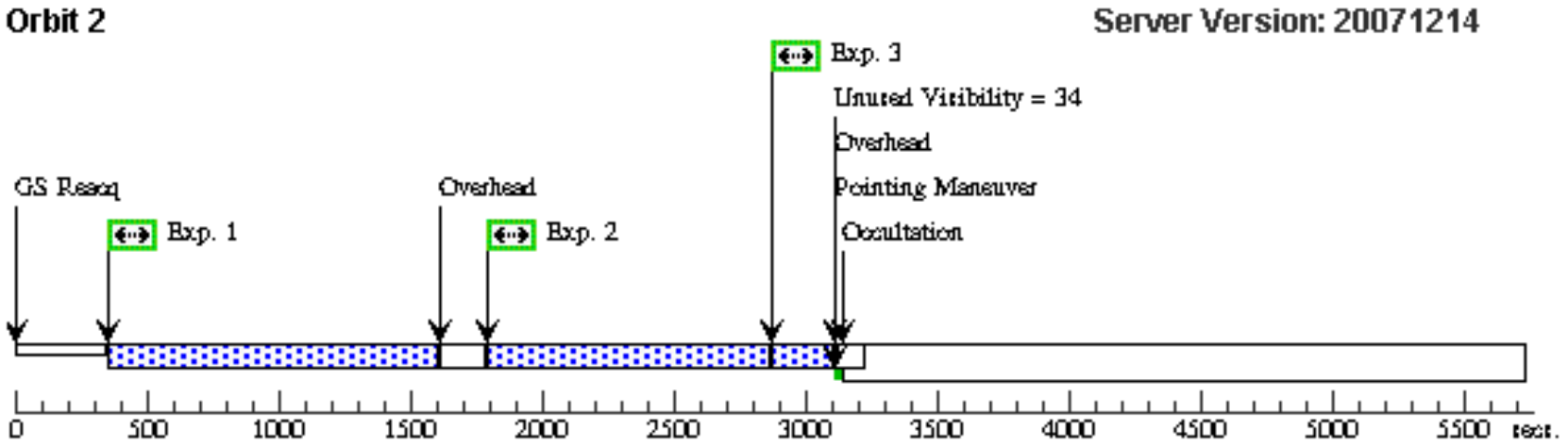
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HE2-10 Alt Name1: ESO495-G021	RA: 08 36 15.1800 (129.0632500d) Dec: -26 24 33.90 (-26.40942d) Equinox: J2000	Radial Velocity: 873 km/sec	V=12.45	Reference Frame: ICRS

Exposures

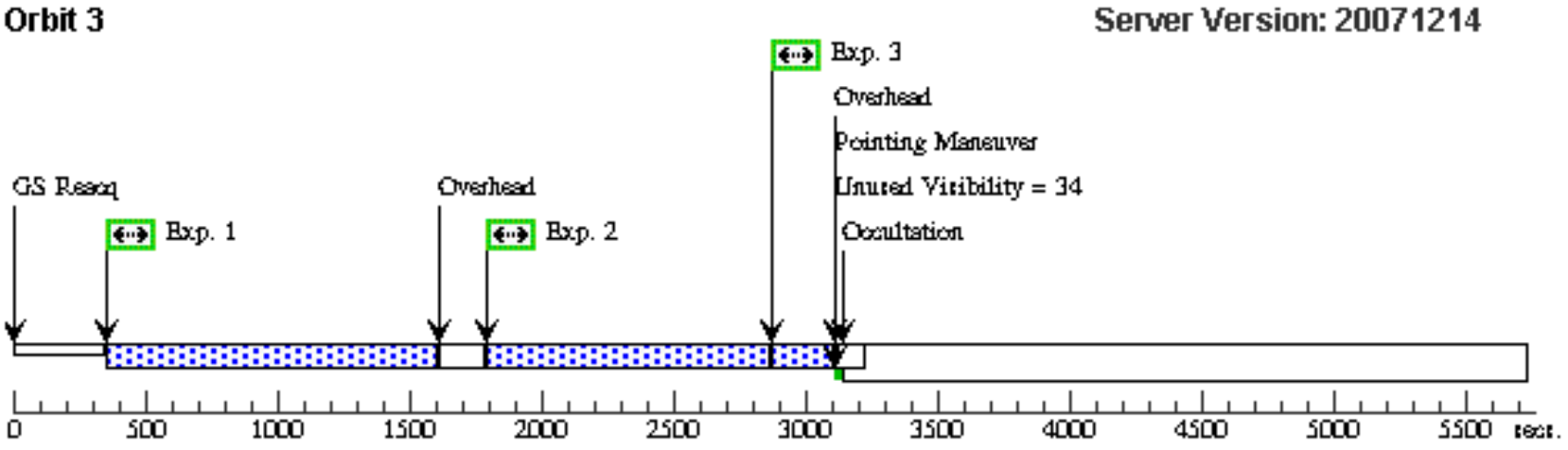
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	H-beta	(1) HE2-10	WFPC2, IMAGE, WF3-FIX	F487N	CR-SPLIT=NO		Pattern 1-3 (1)	1100.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	***[2]***
								[==>(Pattern 3)]	***[3]***
								[==>(Pattern 4)]	***[4]***
2	SulfurII	(1) HE2-10	WFPC2, IMAGE, WF3-FIX	F673N	CR-SPLIT=NO		Pattern 1-3 (1)	800.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	***[2]***
								[==>(Pattern 3)]	***[3]***
								[==>(Pattern 4)]	***[4]***
3	I-band	(1) HE2-10	WFPC2, IMAGE, WF3-FIX	F814W	CR-SPLIT=NO		Pattern 1-3 (1)	160.0 Secs	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	***[2]***
								[==>(Pattern 3)]	***[3]***
								[==>(Pattern 4)]	***[4]***

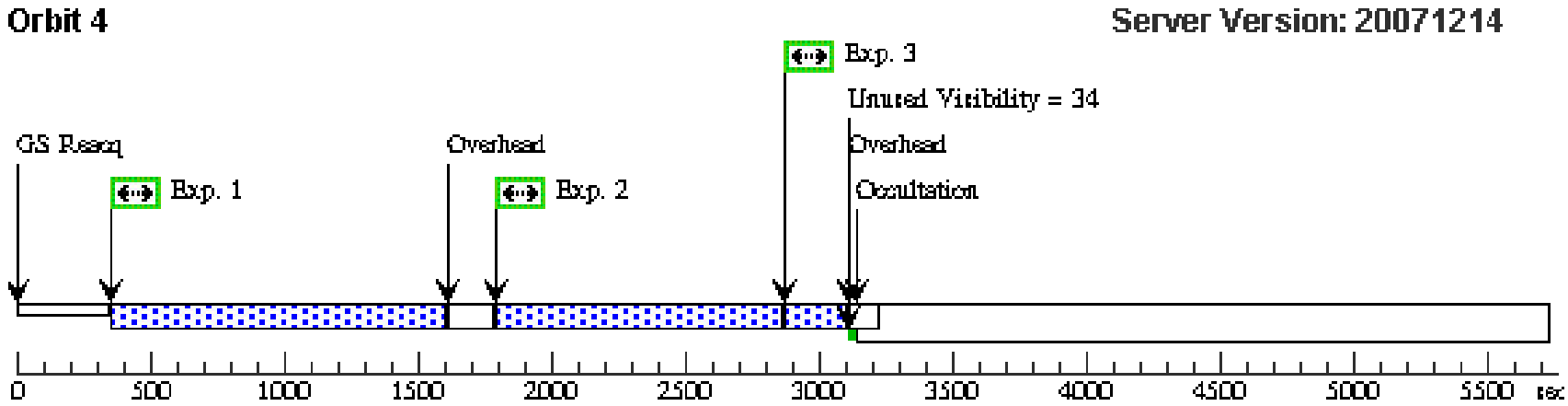
Orbit Structure





Orbit Structure (continued)





Visit

Proposal 11146, Visit 02, failed Fri Jan 18 03:22:46 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFPC2-BOX	Coordinate Frame=POS-TARG		(1-3)
	Purpose=DITHER	Pattern Orientation=26.56505		
	Number Of Points=4	Angle Between Sides=143.1301		
	Point Spacing=0.559017	Center Pattern=false		
	Line Spacing=0.559017			

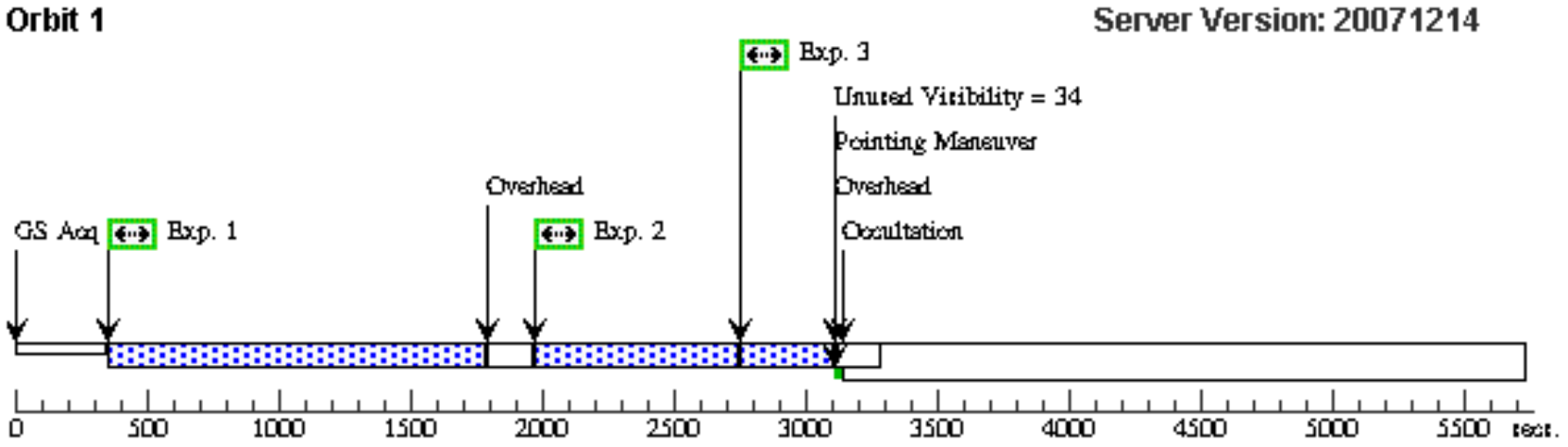
Fixed Targets

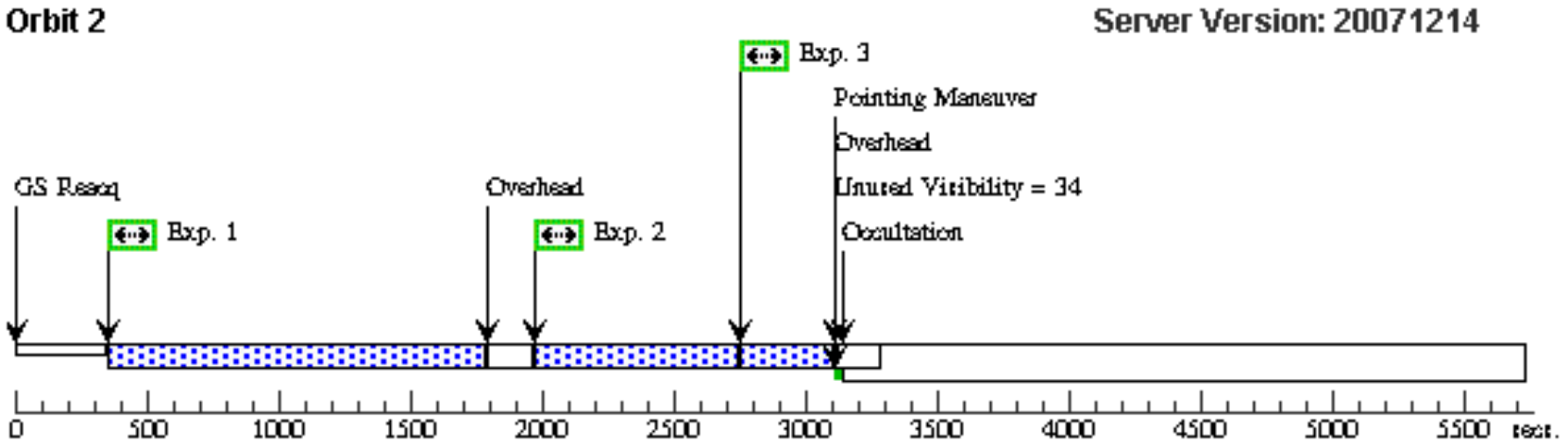
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HE2-10 Alt Name1: ESO495-G021	RA: 08 36 15.1800 (129.0632500d) Dec: -26 24 33.90 (-26.40942d) Equinox: J2000	Radial Velocity: 873 km/sec	V=12.45	Reference Frame: ICRS

Exposures

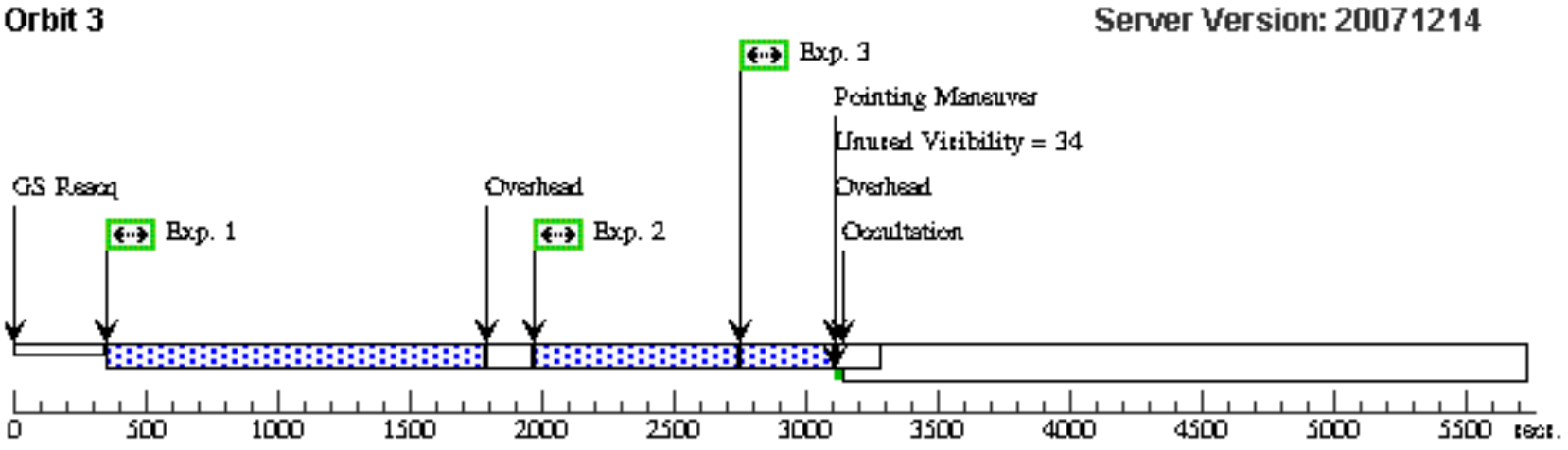
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	OxygenIII	(1) HE2-10	WFPC2, IMAGE, WF3-FIX	F502N	CR-SPLIT=NO		Pattern 1-3 (1)	1300.0 Secs	
								[==>1300.0 Secs (Pattern 1)]	***[1]***
								[==>1300.0 Secs (Pattern 2)]	***[2]***
								[==>1300.0 Secs (Pattern 3)]	***[3]***
								[==>1300.0 Secs (Pattern 4)]	***[4]***
2	H-alpha	(1) HE2-10	WFPC2, IMAGE, WF3-FIX	F658N	CR-SPLIT=NO		Pattern 1-3 (1)	500.0 Secs	
								[==>500.0 Secs (Pattern 1)]	***[1]***
								[==>500.0 Secs (Pattern 2)]	***[2]***
								[==>500.0 Secs (Pattern 3)]	***[3]***
								[==>500.0 Secs (Pattern 4)]	***[4]***
3	V-band	(1) HE2-10	WFPC2, IMAGE, WF3-FIX	F547M	CR-SPLIT=NO		Pattern 1-3 (1)	230.0 Secs	
								[==>260.0 Secs (Pattern 1)]	***[1]***
								[==>260.0 Secs (Pattern 2)]	***[2]***
								[==>260.0 Secs (Pattern 3)]	***[3]***
								[==>260.0 Secs (Pattern 4)]	***[4]***

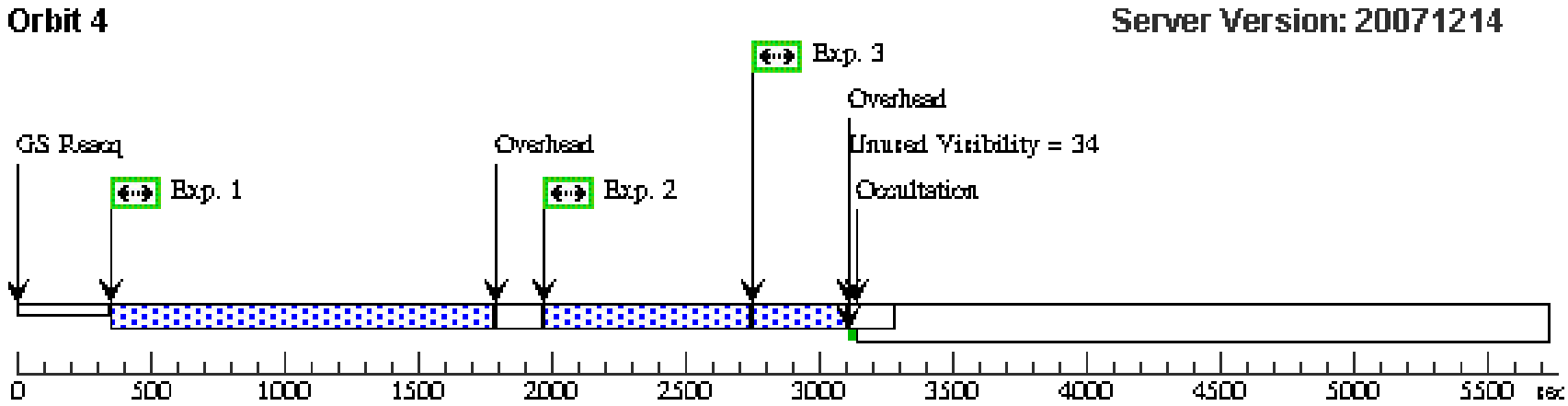
Orbit Structure





Orbit Structure (continued)





Visit

Proposal 11146, Visit A2

Fri Jan 18 03:22:47 GMT 2008

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HE2-10 Alt Name1: ESO495-G021	RA: 08 36 15.1800 (129.0632500d) Dec: -26 24 33.90 (-26.40942d) Equinox: J2000	Radial Velocity: 873 km/sec	V=12.45	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	OxygenIII	(1) HE2-10	WFPC2, IMAGE, WF3-FIX	F502N	CR-SPLIT=NO	POS TARG 0.498,0.249		1300.0 Secs *[==>1300.0 Secs]*	 ***[1]***
2	H-alpha	(1) HE2-10	WFPC2, IMAGE, WF3-FIX	F658N	CR-SPLIT=NO	POS TARG 0.498,0.249		500.0 Secs *[==>500.0 Secs]*	 ***[1]***
3	V-band	(1) HE2-10	WFPC2, IMAGE, WF3-FIX	F547M	CR-SPLIT=NO	POS TARG 0.498,0.249		230.0 Secs *[==>260.0 Secs]*	 ***[1]***

Orbit Structure