10925 - Imaging the Nearest Damped Lyman Alpha Absorbers

Cycle: 15, 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) NGC-3067	WFPC2	3	15-Mar-2007 21:05:14.0	yes
02	(2) ESO-1327--2041	WFPC2	5	15-Mar-2007 21:05:25.0	yes
03	(3) KLEMOLA-31A	WFPC2	5	15-Mar-2007 21:05:39.0	yes
04	(1) NGC-3067	WFPC2	3	15-Mar-2007 21:05:45.0	yes
05	(1) NGC-3067	WFPC2	3	15-Mar-2007 21:05:49.0	yes

19 Total Orbits Used

ABSTRACT

We propose to acquire broad-band and H-alpha imaging of three bright, very nearby host galaxies for damped Ly-alpha absorbers (DLAs). Our targets are the only DLA hosts at z < 0.03 (i.e., spatial resolutions of < 1.2 kpc). The purpose of these observations is to discover the detailed

morphology and kinematics and thus the origins of the gas giving rise to DLAs. While ground-based spectroscopy of DLAs is used to infer indirectly the evolution of galaxy metallicity and thick disk kinematics out to z > 4, only with HST imaging of the very lowest redshift DLA galaxies can we discover these relationships directly. In conjunction with H I 21-cm VLA emission maps, broad-band and H-alpha images of these DLAs will allow us to determine: (1) the sites of active star formation in the host galaxies and their relationship to the QSO sightline, (2) the presence of stellar streams, supernova shells, or bipolar "superwind" outflows in DLA host galaxies, and (3) the detailed spiral structure of the host galaxies, which will allow us to use the lower resolution H I 21-cm emission line images to determine unambiguous DLA kinematics with respect to the host galaxy (i.e., is the DLA rotating with the disk?). Thus, the high resolution imaging will allow us to correctly interpret the kinematics and metallicity information provided by the H I 21-cm VLA maps and HST UV spectroscopy to better inform the high-z results.

OBSERVING DESCRIPTION

This program requires broadband and Halpha imaging of 3 bright nearby (V < 15:5; z < 0:03) galaxies. Whenever possible, we will use ACS/WFC for these observations in order to take advantage of the higher throughput and resolution of ACS as compared to WFPC2, as well as its larger FOV. We will CR-SPLIT and dither all broadband observations to more efficiently reject cosmic rays and improve sub-pixel resolution, but the narrowband observations will not be CR-SPLIT to minimize read-noise.

Halpha imaging of our closest target, NGC3067 (cz=1465 km/s), will be acquired using ACS/WFC with the F660N filter. Two orbits will be required for H imaging of this target and one orbit for the broadband (1500 s each in F435W and F775W). This total Halpha integration time of 2 orbits will allow us to reach comparable depth to the Cecil et al. (2001) F658N image of NGC3079, whose Halpha integration time was 4 orbits with WFPC2. Thus, if the same ?superbubble? structures are present in NGC3067 as in NGC3079, we expect to detect them easily with the proposed images.

Unfortunately, there is no narrowband filter in either ACS or WFPC2 that will allow us to image Halpha at its redshifted wavelength of 6680A for ESO1327?2041 (cz=5370 km/s); therefore, we will observe ESO 1327?2041 in 3 broadband filters (F435W, F625W, F775W) with ACS/WFC. Five orbits will be required for this broadband imaging (1 orbit in F435W and 2 orbits each in F625W and F775W) so that emission line gas present in the difference image (F625W-F775W) is detected with signal-to-noise >15 per resolution element. This signal-to-noise limit will allow us to clearly

detect emission line filaments in the difference image and measure their surface brightness distribution. Ground-based H imaging at 1-arcsec resolution will be used to isolate
the regions where H emission is expected in the HST images.

Halpha imaging of our last target, Klemola 31A (cz=8605 km/s), will be obtained with WFPC2 and the F673N filter. We will also acquire a broadband F791W image for continuum subtraction and a broadband F439W image to locate the sites of active star formation in this galaxy. A total of five orbits will be required for this target, one orbit each for the F439W and F791W images and three orbits for Halpha. These integration times will allow us to detect unresolved H II regions with L(Halpha)>10^37 ergs/s and perform accurate (<0.1 mag) photometry on individual H II regionswith L(Halpha)>6x10^37 ergs/s, corresponding to a star formation rate of >0.001 M/yr.

While the detectability of an individual filamentary structure depends critically on its geometry and spatial extent, these exposure times have been computed assuming a geometry intermediate between well-resolved at all redshifts (i.e., constant surface brightness for z<<1) and unresolved at all redshifts (surface brightness propto 1/r^2). Thus, we request a total of 13 orbits of ACS and WFPC2 imaging for our three target galaxies.

Visit

Proposal 10925, Visit 01, implementation Fri Mar 16 01:05:52 GMT 2007

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: ORIENT 35.0D TO 100.0 D; ORIENT 245.0D TO 300.0 D

Comments: NGC3067 Continuum Obs (now WFPC2)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=LINE	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=45		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.121	Center Pattern=false		
	Line Spacing=			

Fixed Targets

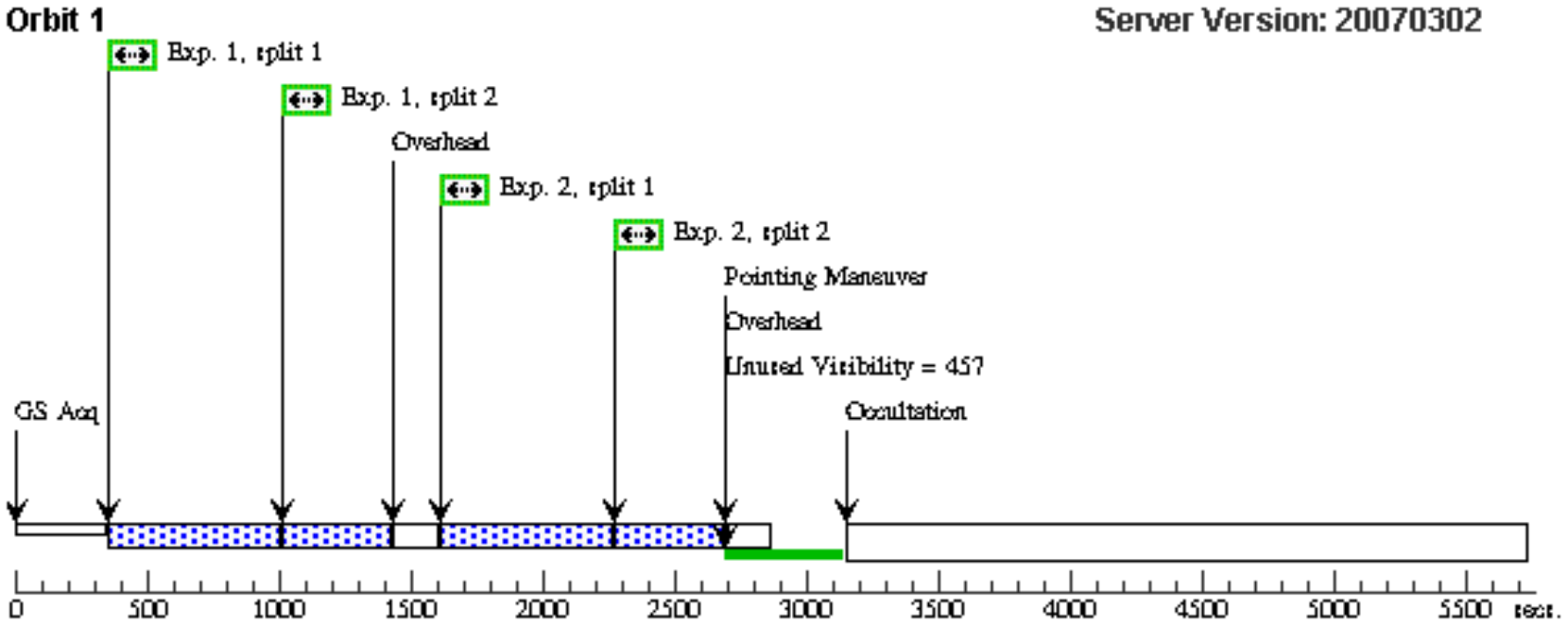
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC-3067	RA: 09 58 21.7258 (149.5905242d)	Radial Velocity: 1465.0 km/sec	V=12.1+/-0.1	Reference Frame: NED
		Dec: +32 23 2.85 (32.38412d)			
		Equinox: J2000			

Comments: This object was generated by the targetselector and retrieved from the NED database.

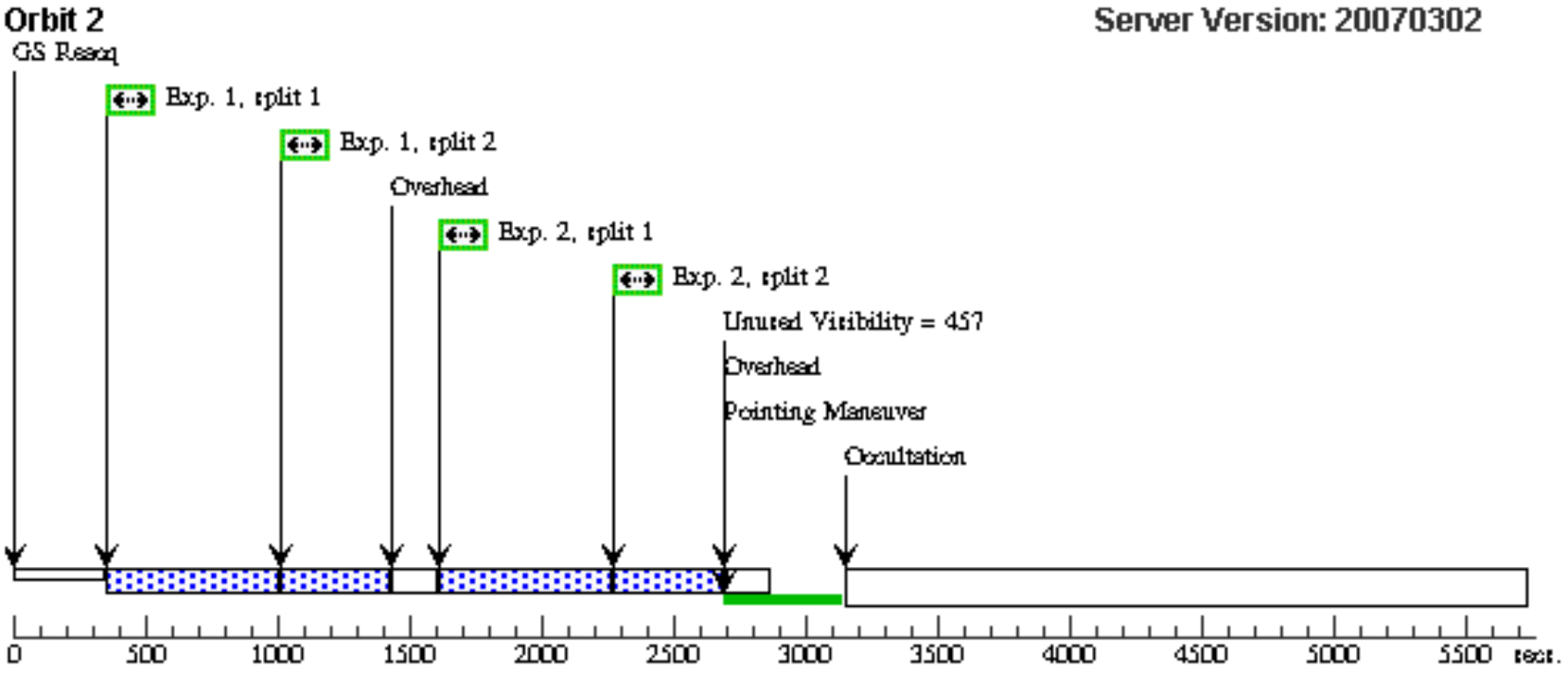
Exposures

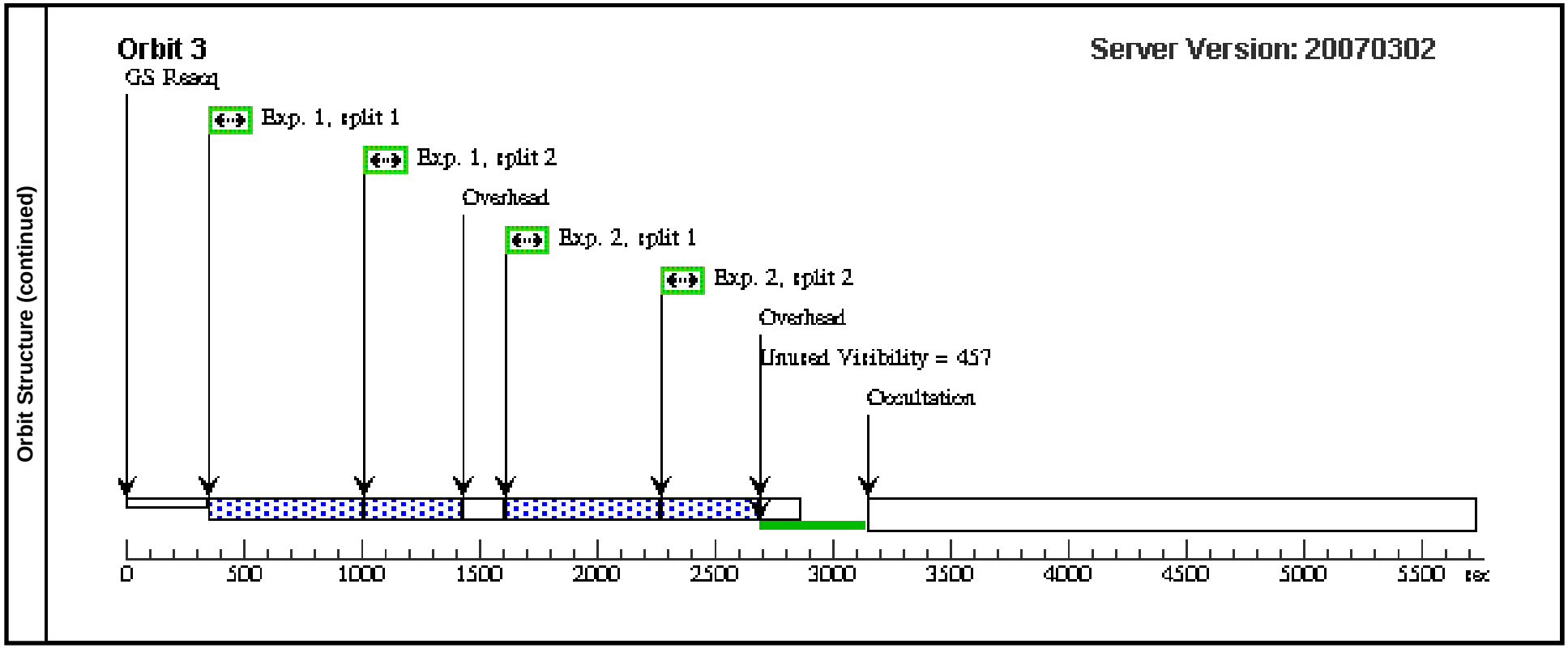
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	NGC3067 F 435W	(1) NGC-3067	WFPC2, IMAGE, WFALL-FIX	F450W			Pattern 1-2 (2)	1000.0 Secs	
								[==>400.0 Secs (Pattern 1, Split 1)]	***[1]***
								[==>400.0 Secs (Pattern 1, Split 2)]	
								[==>400.0 Secs (Pattern 2, Split 1)]	***[2]***
								[==>400.0 Secs (Pattern 2, Split 2)]	
								[==>400.0 Secs (Pattern 3, Split 1)]	***[3]***
								[==>400.0 Secs (Pattern 3, Split 2)]	
2	NGC3067 F 775W	(1) NGC-3067	WFPC2, IMAGE, WFALL-FIX	F791W			Pattern 1-2 (2)	1000.0 Secs	
								[==>400.0 Secs (Pattern 1, Split 1)]	***[1]***
								[==>400.0 Secs (Pattern 1, Split 2)]	
								[==>400.0 Secs (Pattern 2, Split 1)]	***[2]***
								[==>400.0 Secs (Pattern 2, Split 2)]	
								[==>400.0 Secs (Pattern 3, Split 1)]	***[3]***
								[==>400.0 Secs (Pattern 3, Split 2)]	

Orbit Structure



Orbit Structure (continued)




Orbit Structure (continued)
Orbit 3
Server Version: 20070302
GS Reacq
Exp. 1, split 1
Exp. 1, split 2
Overhead
Exp. 2, split 1
Exp. 2, split 2
Overhead
Unused Visibility = 457
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10925, Visit 02, implementation Fri Mar 16 01:05:54 GMT 2007

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: (none)

Comments: ESO1327 Obs (now WFPC2)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=LINE	Coordinate Frame=POS-TARG		(1), (2-3)
	Purpose=DITHER	Pattern Orientation=45		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.121	Center Pattern=false		
	Line Spacing=			

Fixed Targets

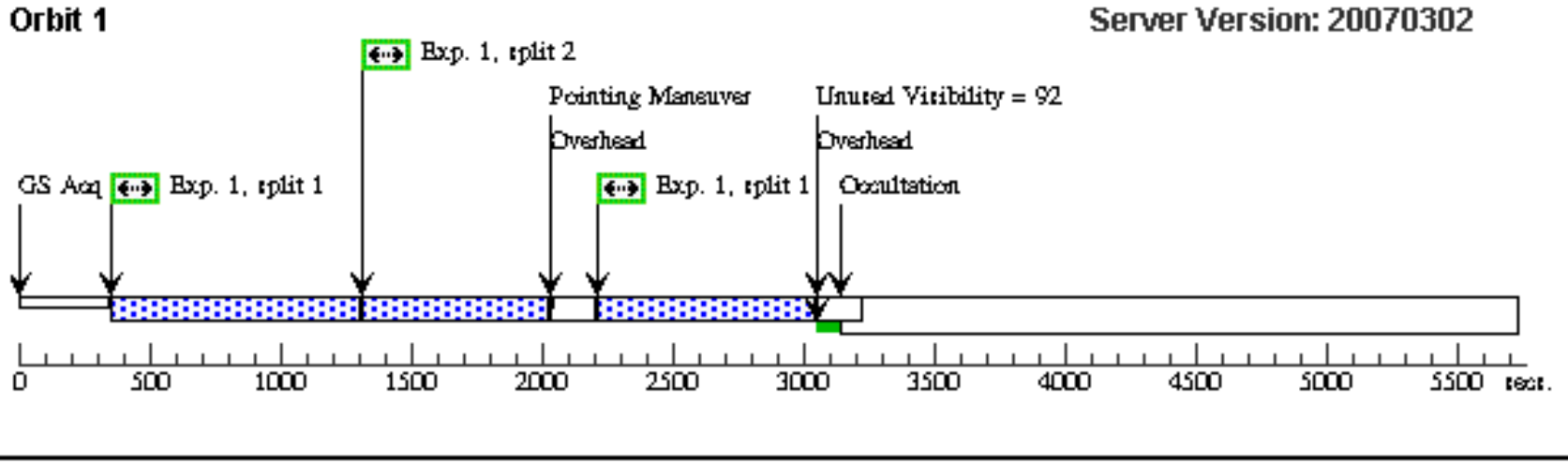
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	ESO-1327--2041	RA: 13 30 6.5000 (202.5270833d) Dec: -20 56 7.00 (-20.93528d) Equinox: J2000	Radial Velocity: 5370.0 km/sec	V=14.0+/-0.2	Reference Frame: NED

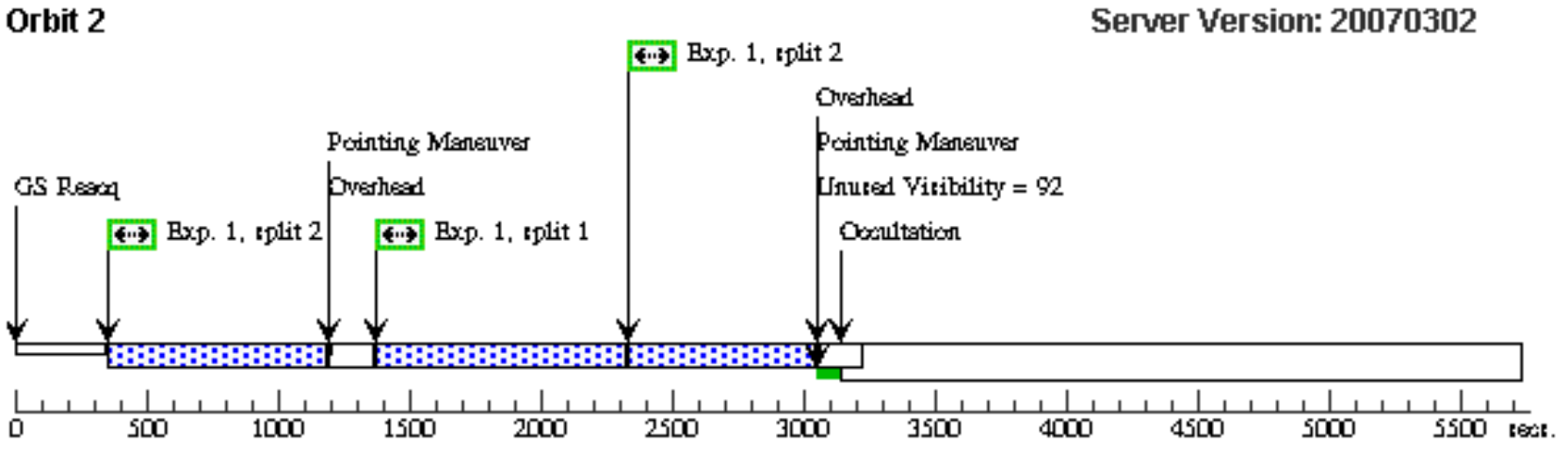
Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

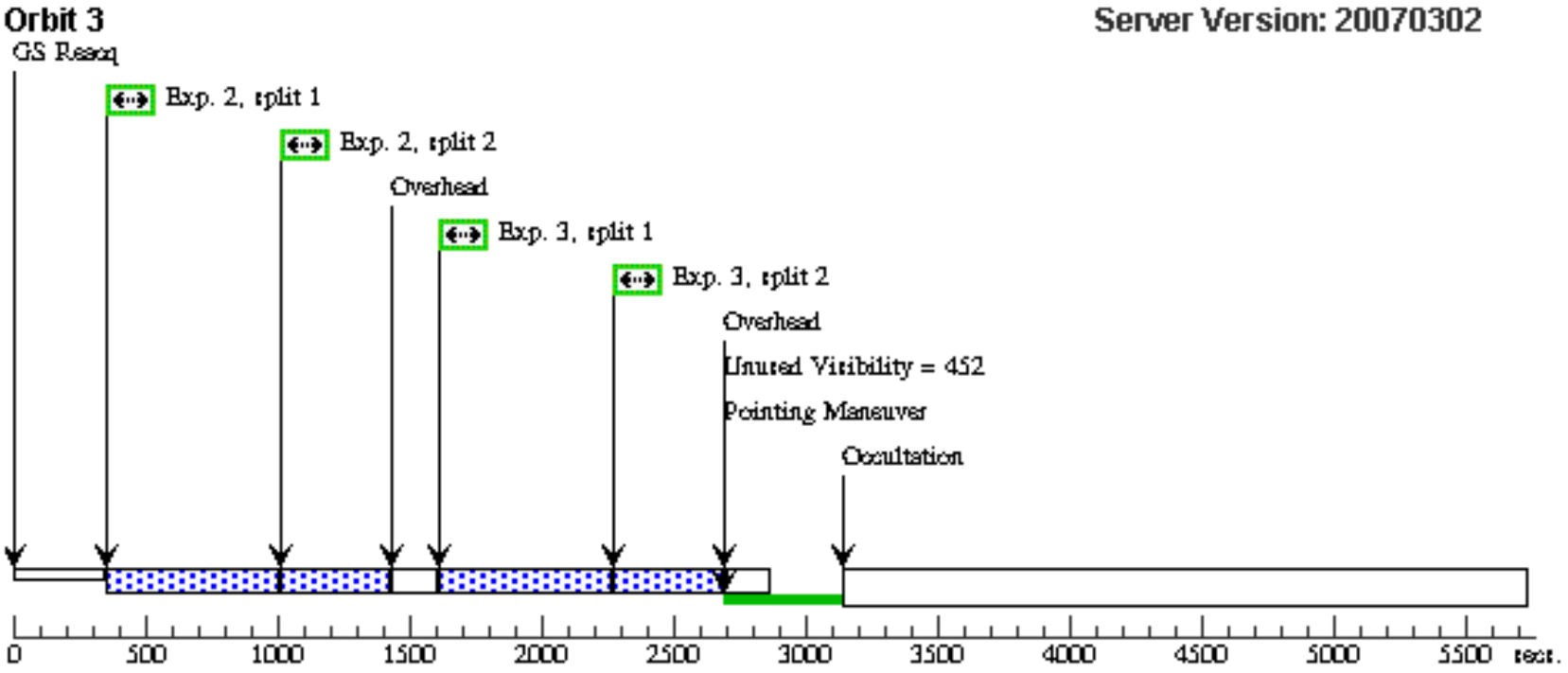
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ESO1327-2041 Halpha	(2) ESO-1327--2041	WFPC2, IMAGE, WF3	F675W			Pattern 1-1 (2)	2000.0 Secs	
								[==>700.0 Secs (Pattern 1, Split 1)]	***[1]***
								[==>700.0 Secs (Pattern 1, Split 2)]	
								[==>700.0 Secs (Pattern 2, Split 1)]	
								[==>700.0 Secs (Pattern 2, Split 2)]	***[2]***
								[==>700.0 Secs (Pattern 3, Split 1)]	
								[==>700.0 Secs (Pattern 3, Split 2)]	
2	ESO1327-2041 Blue Cont.	(2) ESO-1327--2041	WFPC2, IMAGE, WF3	F450W			Pattern 2-3 (2)	4000.0 Secs	
								[==>400.0 Secs (Pattern 1, Split 1)]	***[3]***
								[==>400.0 Secs (Pattern 1, Split 2)]	
								[==>400.0 Secs (Pattern 2, Split 1)]	***[4]***
								[==>400.0 Secs (Pattern 2, Split 2)]	
								[==>400.0 Secs (Pattern 3, Split 1)]	***[5]***
								[==>400.0 Secs (Pattern 3, Split 2)]	
3	ESO1327-2041 F775W	(2) ESO-1327--2041	WFPC2, IMAGE, WF3	F791W			Pattern 2-3 (2)	4000.0 Secs	
								[==>400.0 Secs (Pattern 1, Split 1)]	***[3]***
								[==>400.0 Secs (Pattern 1, Split 2)]	
								[==>400.0 Secs (Pattern 2, Split 1)]	***[4]***
								[==>400.0 Secs (Pattern 2, Split 2)]	
								[==>400.0 Secs (Pattern 3, Split 1)]	***[5]***
								[==>400.0 Secs (Pattern 3, Split 2)]	

Orbit Structure

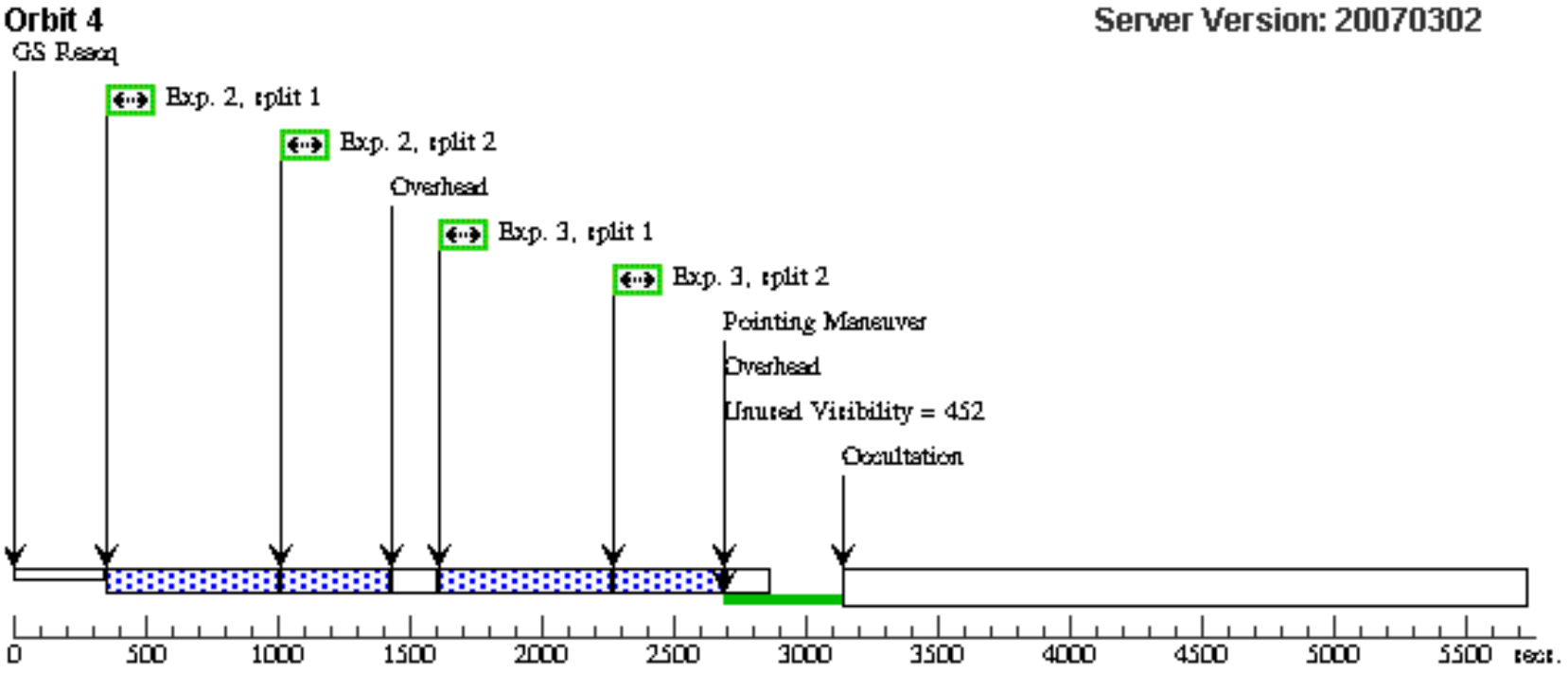


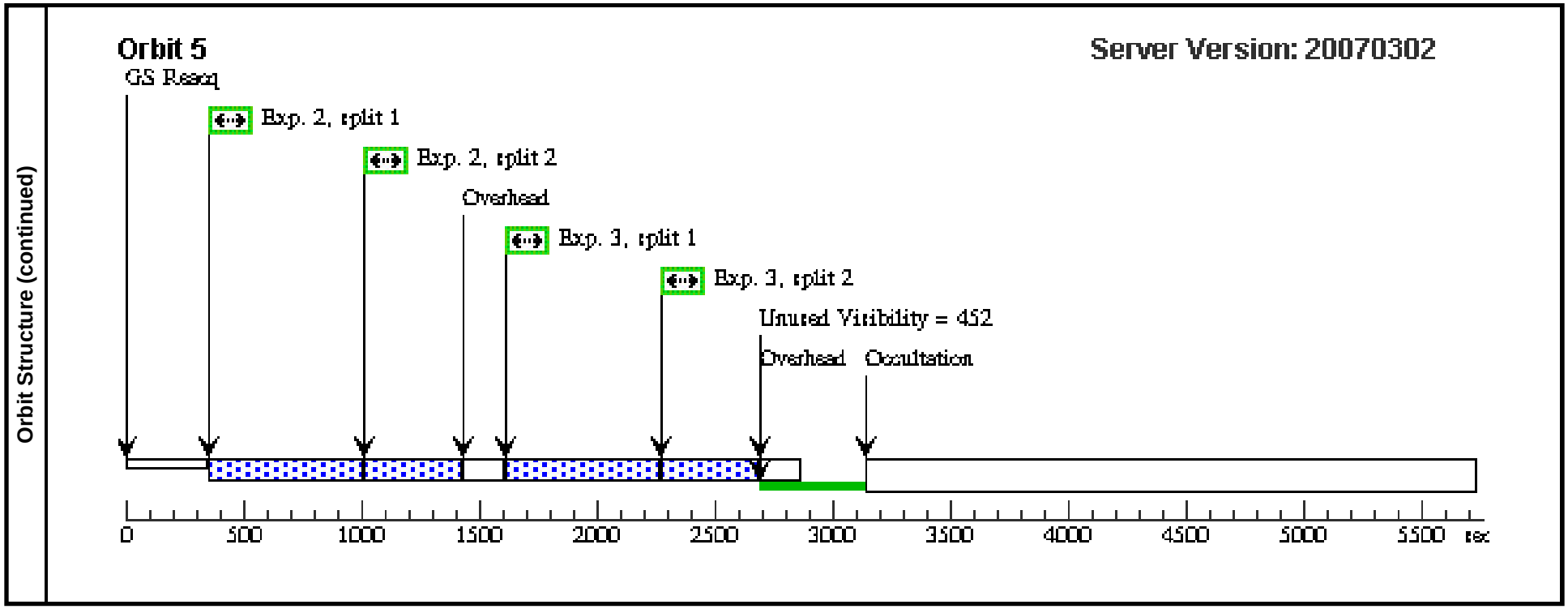


Orbit Structure (continued)



Orbit Structure (continued)




Orbit Structure (continued)
Orbit 5
Server Version: 20070302
GS Reacq
Exp. 2, split 1
Exp. 2, split 2
Overhead
Exp. 3, split 1
Exp. 3, split 2
Unused Visibility = 452
Overhead
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 10925, Visit 03, completed Fri Mar 16 01:05:55 GMT 2007

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: ORIENT 0.0D TO 13.0 D; ORIENT 24.0D TO 50.0 D; ORIENT 75.0D TO 86.0 D; ORIENT 120.0D TO 176.0 D; ORIENT 187.0D TO 270.0 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=LINE	Coordinate Frame=POS-TARG		(1-2)
	Purpose=DITHER	Pattern Orientation=45		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=2.121	Center Pattern=false		
	Line Spacing=			
(2)	Pattern Type=LINE	Coordinate Frame=POS-TARG		(3)
	Purpose=DITHER	Pattern Orientation=45		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.121	Center Pattern=false		
	Line Spacing=			

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	KLEMOLA-31A	RA: 20 23 46.2238 (305.9425992d) Dec: -36 55 20.11 (-36.92225d) Equinox: J2000	Radial Velocity: 8605.0 km/sec	V=15.3+/-0.2	Reference Frame: NED

Comments: This object was generated by the targetselector and retrieved from the NED database.

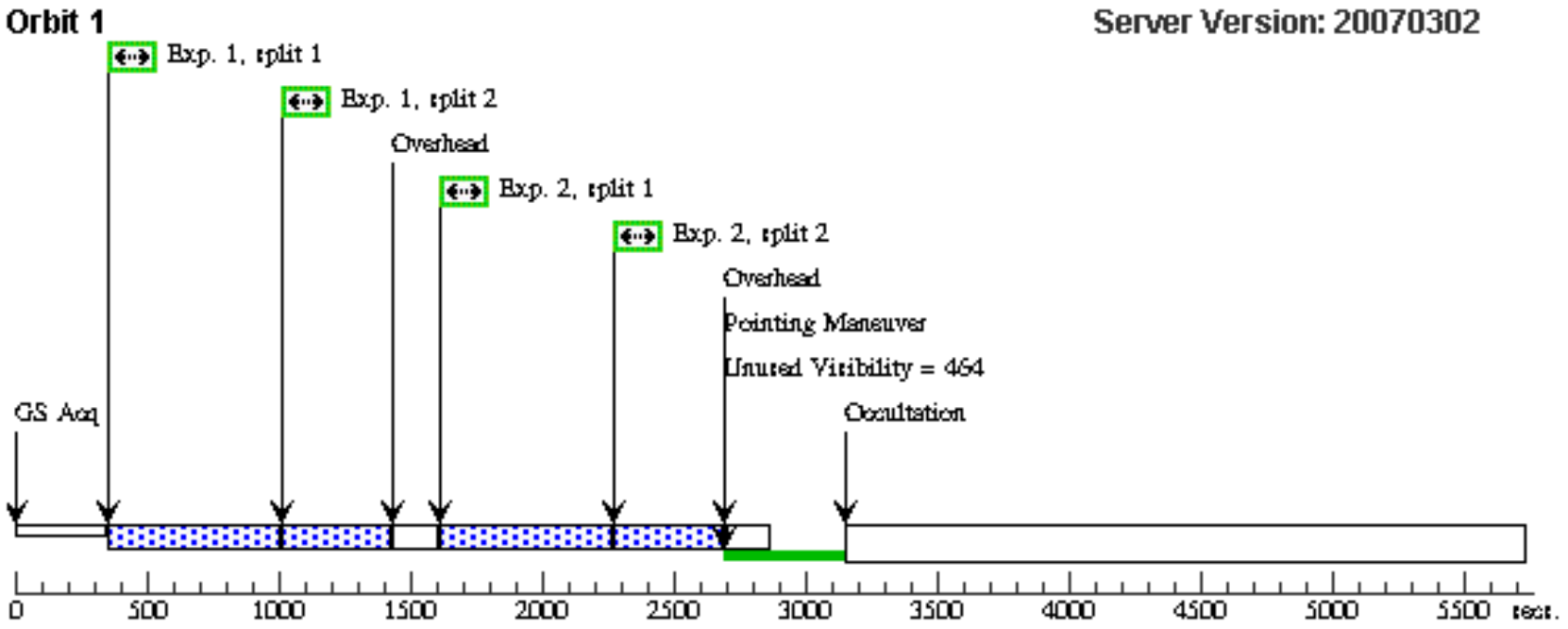
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	PKS2020 F439W	(3) KLEMOLA-31A	WFPC2, IMAGE, WFALL	F439W			Pattern 1-2 (1)	2000.0 Secs	
								[==>400.0 Secs (Pattern 1, Split 1)] *[==>400.0 Secs (Pattern 1, Split 2)]*	***[1]***
								[==>400.0 Secs (Pattern 2, Split 1)] *[==>400.0 Secs (Pattern 2, Split 2)]*	***[2]***
2	PKS2020 F791W	(3) KLEMOLA-31A	WFPC2, IMAGE, WFALL	F791W			Pattern 1-2 (1)	2000.0 Secs	
								[==>400.0 Secs (Pattern 1, Split 1)] *[==>400.0 Secs (Pattern 1, Split 2)]*	***[1]***
								[==>400.0 Secs (Pattern 2, Split 1)] *[==>400.0 Secs (Pattern 2, Split 2)]*	***[2]***

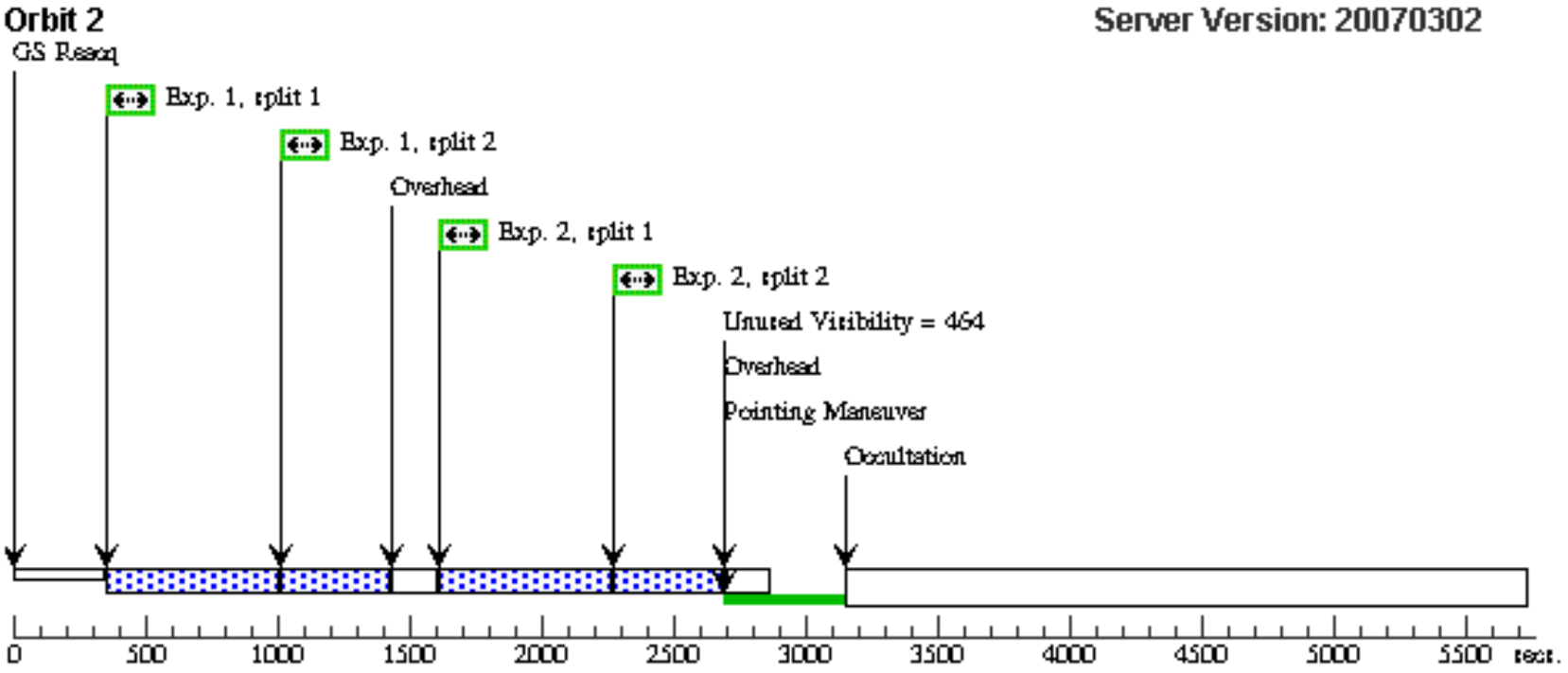
Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
3	PKS2020 F673N F6	(3) KLEMOLA-31A	WFPC2, IMAGE, WFALL	F673N			Pattern 3-3 (2)	6000.0 Secs	
								[==>1200.0 Secs (Pattern 1, Split 1)] *[==>1200.0 Secs (Pattern 1, Split 2)]*	***[3]***
								[==>1200.0 Secs (Pattern 2, Split 1)] *[==>1200.0 Secs (Pattern 2, Split 2)]*	***[4]***
								[==>1200.0 Secs (Pattern 3, Split 1)] *[==>1200.0 Secs (Pattern 3, Split 2)]*	***[5]***

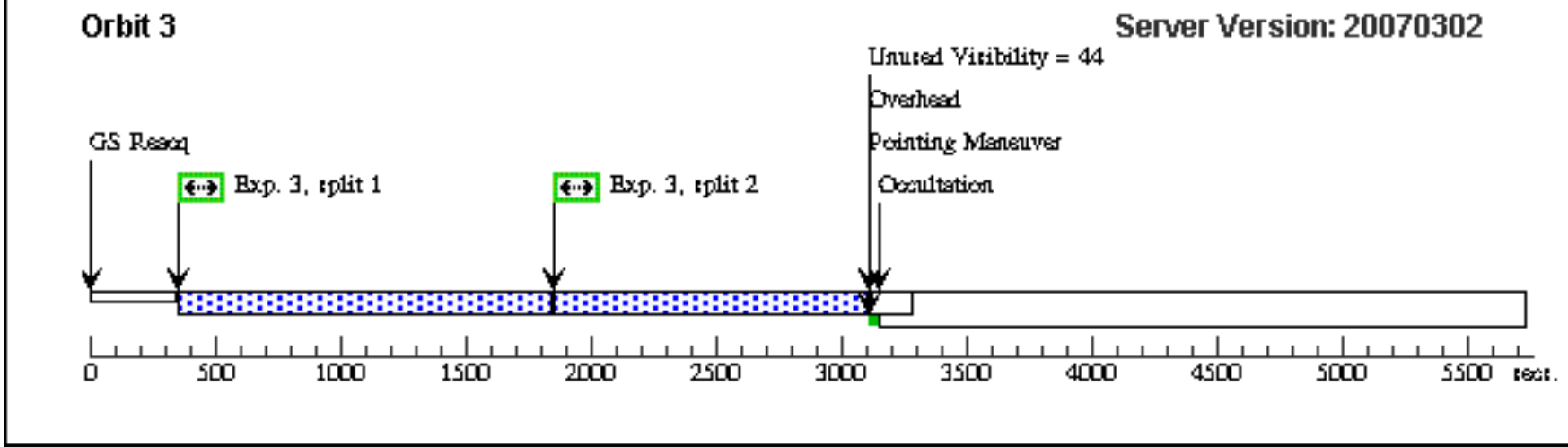
Orbit Structure

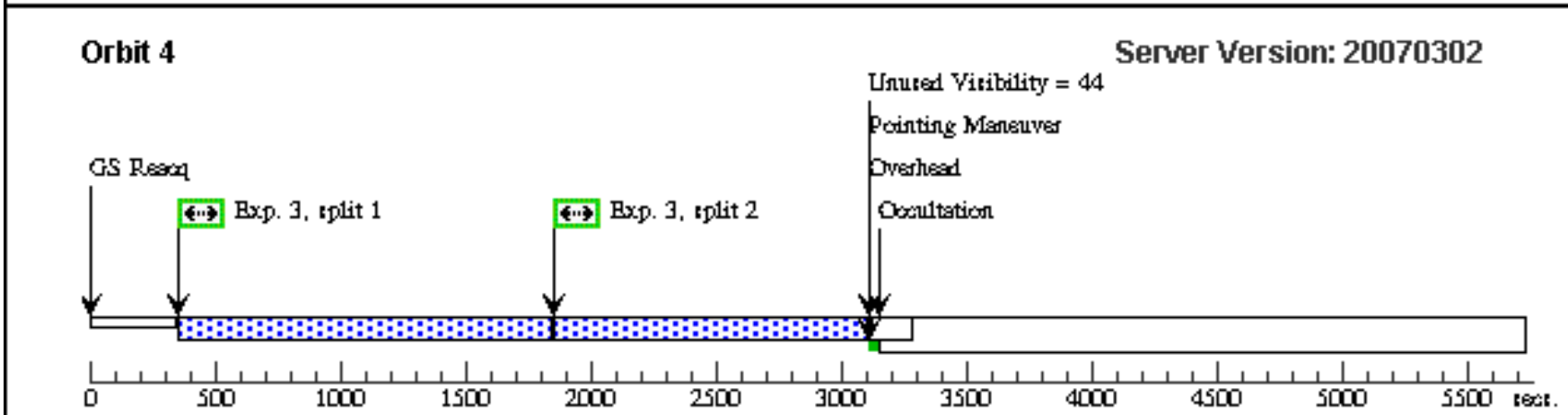


Orbit Structure (continued)

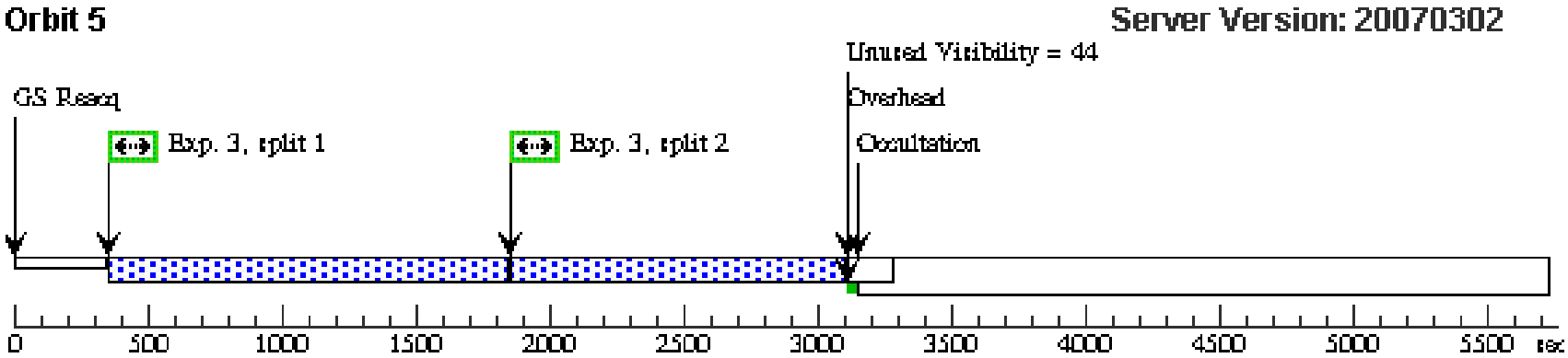


Orbit Structure (continued)





Orbit Structure (continued)



Visit

Proposal 10925, Visit 04, implementation Fri Mar 16 01:05:57 GMT 2007

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: SAME ORIENT AS 01

Comments: NGC3067 Ha obs #1

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=LINE	Coordinate Frame=POS-TARG		(1)
	Purpose=DITHER	Pattern Orientation=45		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.121	Center Pattern=false		
	Line Spacing=			

Fixed Targets

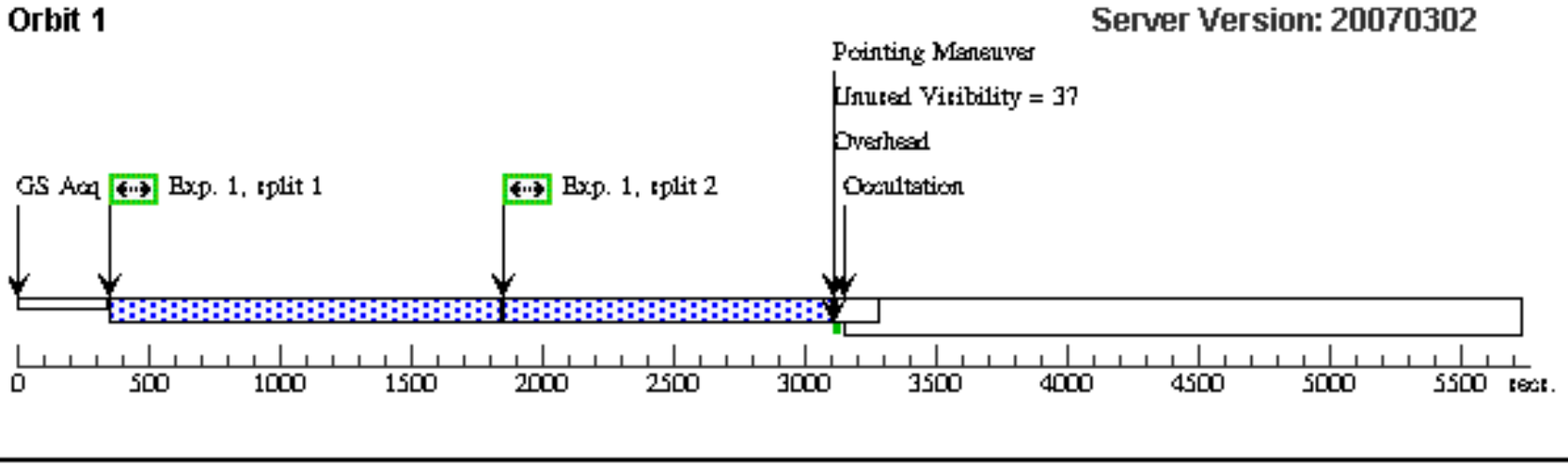
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC-3067	RA: 09 58 21.7258 (149.5905242d)	Radial Velocity: 1465.0 km/sec	V=12.1+/-0.1	Reference Frame: NED
		Dec: +32 23 2.85 (32.38412d)			
		Equinox: J2000			

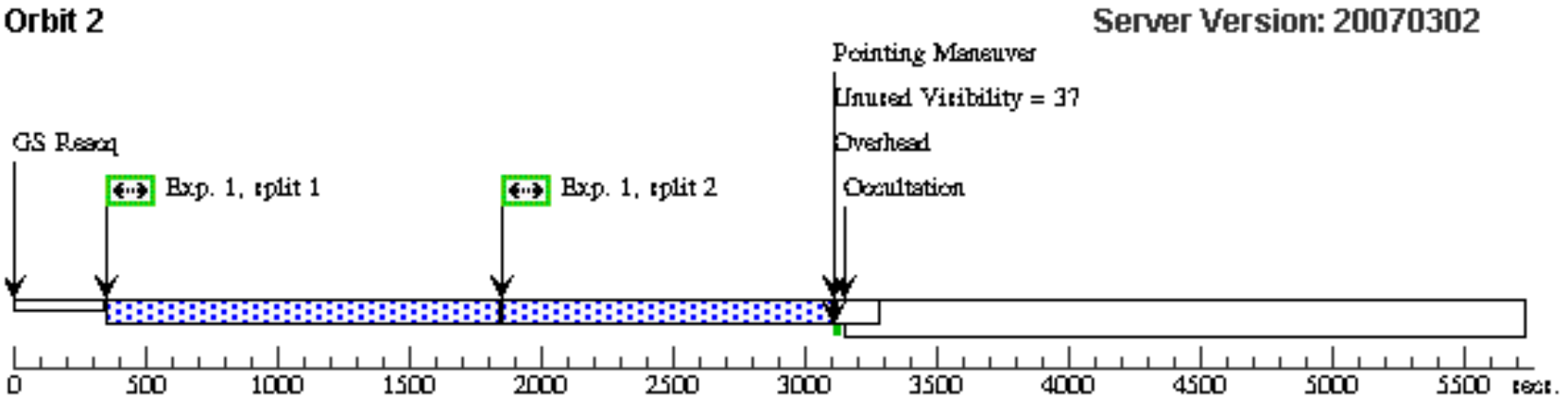
Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures

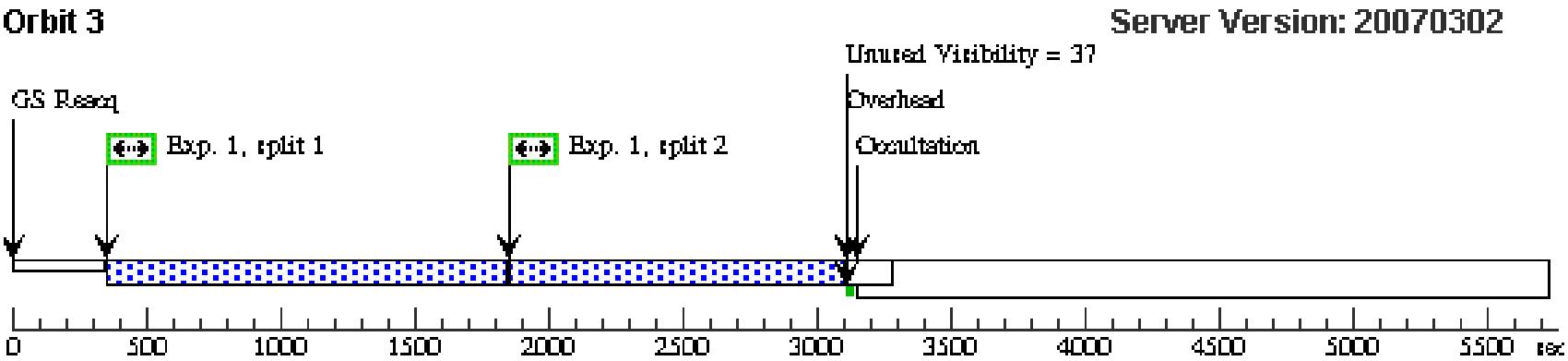
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	NGC3067 H a obs 1	(1) NGC-3067	WFPC2, IMAGE, WFALL-FIX	F658N			Pattern 1-1 (2)	7200.0 Secs	
								[==>1200.0 Secs (Pattern 1, Split 1)] *[==>1200.0 Secs (Pattern 1, Split 2)]*	***[1]***
								[==>1200.0 Secs (Pattern 2, Split 1)] *[==>1200.0 Secs (Pattern 2, Split 2)]*	***[2]***
								[==>1200.0 Secs (Pattern 3, Split 1)] *[==>1200.0 Secs (Pattern 3, Split 2)]*	***[3]***

Orbit Structure





Orbit Structure (continued)



Visit

Proposal 10925, Visit 05, implementation Fri Mar 16 01:05:58 GMT 2007

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: SAME ORIENT AS 01

Comments: NGC3067 Ha obs #2

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=LINE	Coordinate Frame=POS-TARG		(1)
	Purpose=DITHER	Pattern Orientation=45		
	Number Of Points=3	Angle Between Sides=		
	Point Spacing=2.121	Center Pattern=false		
	Line Spacing=			

Fixed Targets

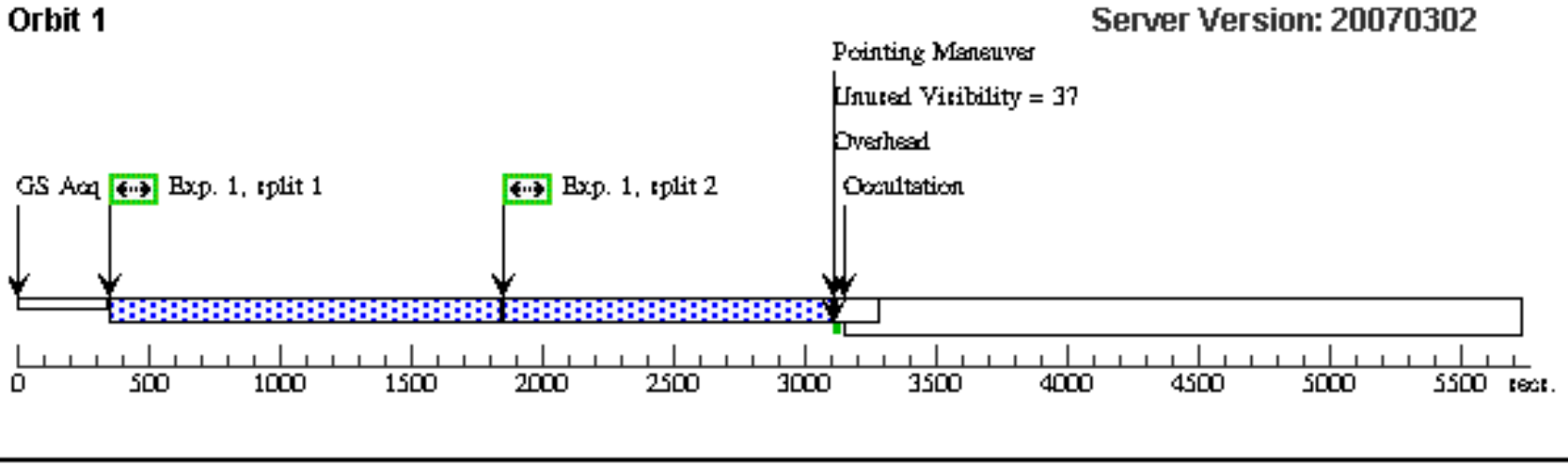
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC-3067	RA: 09 58 21.7258 (149.5905242d)	Radial Velocity: 1465.0 km/sec	V=12.1+/-0.1	Reference Frame: NED
		Dec: +32 23 2.85 (32.38412d)			
		Equinox: J2000			

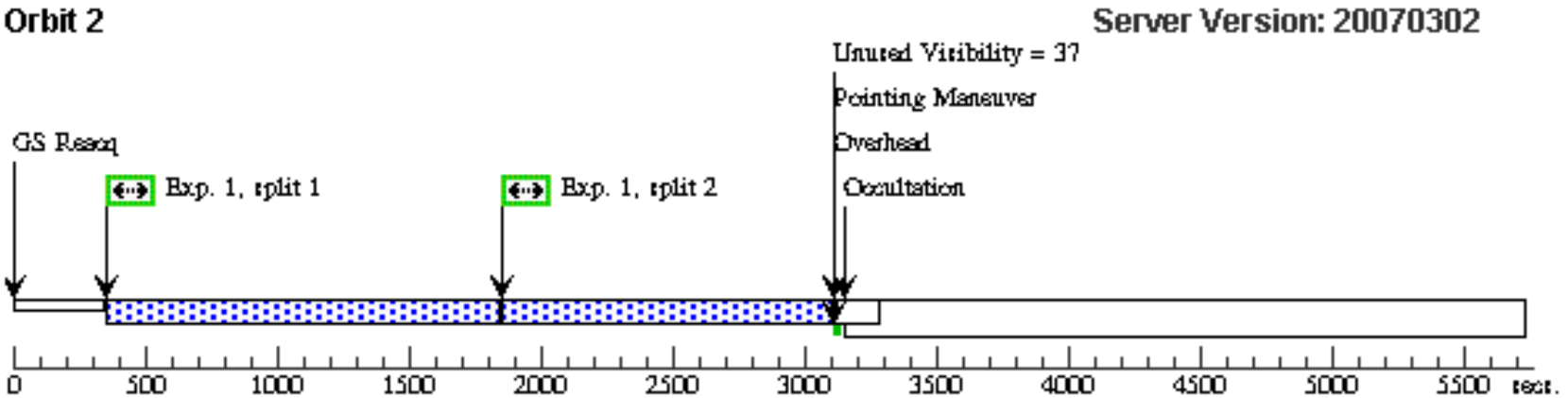
Comments: This object was generated by the targetselector and retrieved from the NED database.

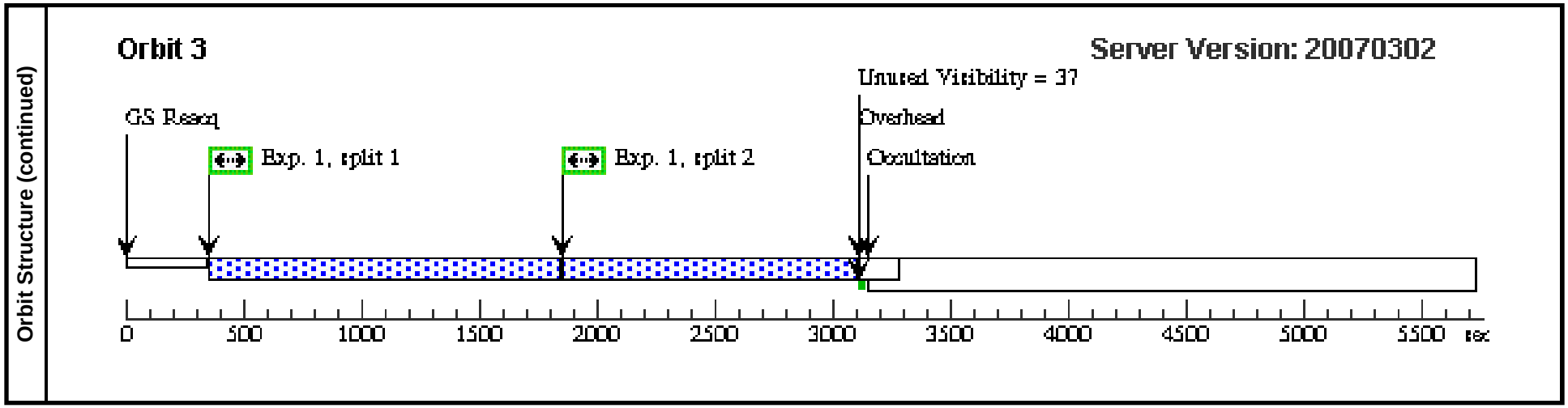
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	NGC3067 H a obs 2	(1) NGC-3067	WFPC2, IMAGE, WFALL-FIX	F658N			Pattern 1-1 (2)	7200.0 Secs	
								[==>1200.0 Secs (Pattern 1, Split 1)] *[==>1200.0 Secs (Pattern 1, Split 2)]*	***[1]***
								[==>1200.0 Secs (Pattern 2, Split 1)] *[==>1200.0 Secs (Pattern 2, Split 2)]*	***[2]***
								[==>1200.0 Secs (Pattern 3, Split 1)] *[==>1200.0 Secs (Pattern 3, Split 2)]*	***[3]***

Orbit Structure






Orbit Structure (continued)
Orbit 3
Server Version: 20070302
Unused Visibility = 37
GS Reacq
Exp. 1, split 1
Exp. 1, split 2
Overhead
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec