11632 - The Gaseous Corona of M31

Cycle: 17, 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) IO-AND ANY	ACS/WFC COS/FUV COS/NUV WFC3/UVIS	2	06-May-2009 21:02:12.0	yes
02	(2) 2MASX-J01013113+4229356 ANY	ACS/WFC COS/FUV COS/NUV WFC3/UVIS	2	06-May-2009 21:02:21.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
03	(3) HS-0033+4300 ANY	ACS/WFC COS/FUV COS/NUV WFC3/UVIS	4	06-May-2009 21:02:36.0	yes

8 Total Orbits Used

ABSTRACT

We propose to obtain ultraviolet spectroscopy of the halo of M31, to probe for a hot corona on scales of 30-40 pc from the galaxy. We seek to obtain absorption line spectra of O I, Mg II, Si II, C IV, and Si IV toward bright QSOs located behind the galaxy. One of the sightlines falls on the projection of Ibata's giant stream. All background sources have been vetted with GALEX photometry and are therefore bright enough for observation. If hot gas is detected with this initial study, we will endeavor to use a grid of background sources to map the structure and kinematics of this gas in detail. M31 is the nearest major spiral galaxy for which such a study can be undertaken, other than our own Milky Way. Recent studies find a substantial population of HI high velocity clouds at distances form M31 of up to 50 kpc, and there is well documented evidence of disrupted satellites and tidal streams. These observations will shed light on the hot gaseous halo of M31, but also will help in interpreting QSO sightlines at high redshift.

OBSERVING DESCRIPTION

G130M and G160M will be used to observe NV 1238, 1242; SiIV 1393, 1402; and CIV 1548, 1550.
Exposure times and expected S/N levels are provided in the exposure comments.
Buffer times are all longer than 1 orbit, which facilitates parallel exposures with ACS/WFC and WFC3/UVIS.
We will use the ACS F606W and F814W filters, and the WFC3 F475W and F814W to provide shallow imaging of three fields in the M31 halo.

Visit

Proposal 11632, Visit 01, implementation Thu May 07 01:02:42 GMT 2009

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC, COS/NUV, COS/FUV, WFC3/UVIS

Special Requirements: (none)

Diagnostics

(Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN

Fixed Targets

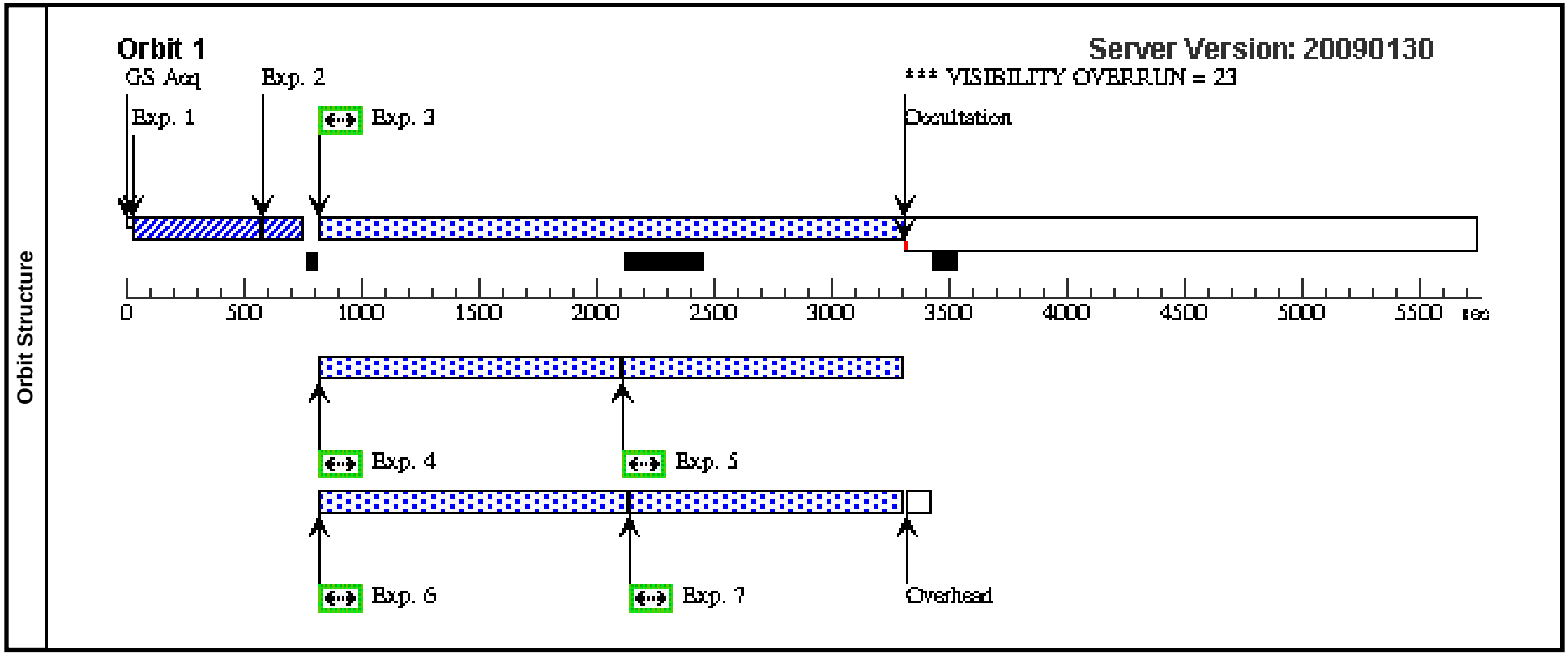
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	IO-AND	RA: 00 48 18.9800 (12.0790833d) Dec: +39 41 11.60 (39.68656d) Equinox: J2000		V=16.5+/-0.5 NUV(AB)=16.7, FUV(AB)=16.9	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) IO-AND	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=2			24 Secs *[==>]*	 ***[1]***
Comments: Exposure time is 24 seconds per dwell for S/N=40 with MIRRORB. Too bright for MIRRORA. Nomalized to GALEX NUV magnitude = 16.7 in ETC.									
2		(1) IO-AND	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				24 Secs *[==>]*	 ***[1]***
Comments: Exposure time is 24 seconds for S/N=40 with MIRRORB. Too bright for MIRRORA. Nomalized to GALEX NUV magnitude = 16.7 in ETC.									
3		(1) IO-AND	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FLASH=YES; BUFFER-TIME=2330		Prime + Parallel Group 3-7	2330 Secs *[==>]*	 ***[1]***
Comments: Exposure yields S/N=16 at NV 1240, and S/N=12 at SiIV 1400 for GALEX(FUV)=16.9. ETC buffer time of 3023 sec set to 2350 sec, which should be okay.									
4		ANY	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1070 Secs *[==>]*	 ***[1]***
Comments: Parallel with COS prime									
5		ANY	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1070 Secs *[==>]*	 ***[1]***
Comments: Parallel with COS prime									
6		ANY	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1160 Secs *[==>]*	 ***[1]***
Comments: Parallel with COS prime									
7		ANY	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1160 Secs *[==>]*	 ***[1]***
Comments: Parallel with COS prime									

Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
8		(1) IO-AND	COS/FUV, TIME-TAG, PSA	G160M 1577 A	FLASH=YES; BUFFER-TIME=2900		Prime + Parallel Group 8-12	2900 Secs *[==>]*	 ***[2]***
Comments: Using central wavelength of 1577 allows both SiIV and CIV to be observed. Exposure yields S/N=15 at CIV 1550, and S/N=17 at SiIV 1400 for GALEX(FUV)=16.9. ETC buffer time of 6574 sec set to 3000 sec.									
9		ANY	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1390 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									
10		ANY	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1390 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									
11		ANY	WFC3/UVIS, ACCUM, UVIS	F475W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1470 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									
12		ANY	WFC3/UVIS, ACCUM, UVIS	F475W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1470 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									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GS Acq
Exp. 1
Exp. 2
Exp. 3
*** VISIBILITY OVERRUN = 23
Occultation
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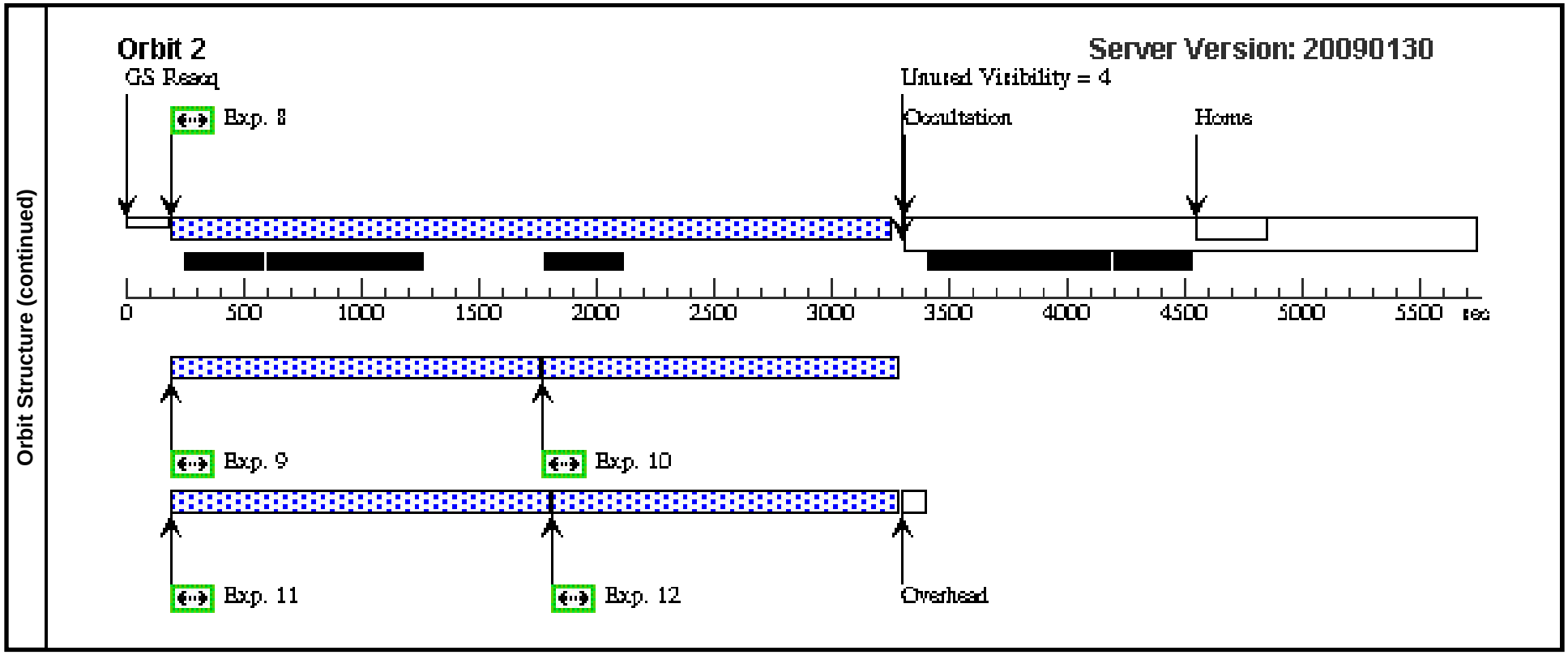
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 4
Exp. 5
Exp. 6
Exp. 7
Overhead


Orbit Structure (continued)
Orbit 2
Server Version: 20090130
GS Reacq
Unused Visibility = 4
Exp. 8
Occultation
Home
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1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 9
Exp. 10
Exp. 11
Exp. 12
Overhead

Visit

Proposal 11632, Visit 02, implementation Thu May 07 01:02:43 GMT 2009

Diagnostic Status: Warning

Scientific Instruments: ACS/WFC, COS/NUV, COS/FUV, WFC3/UVIS

Special Requirements: (none)

Diagnostics

(Visit 02) Warning (Orbit Planner): VISIBILITY OVERRUN

Fixed Targets

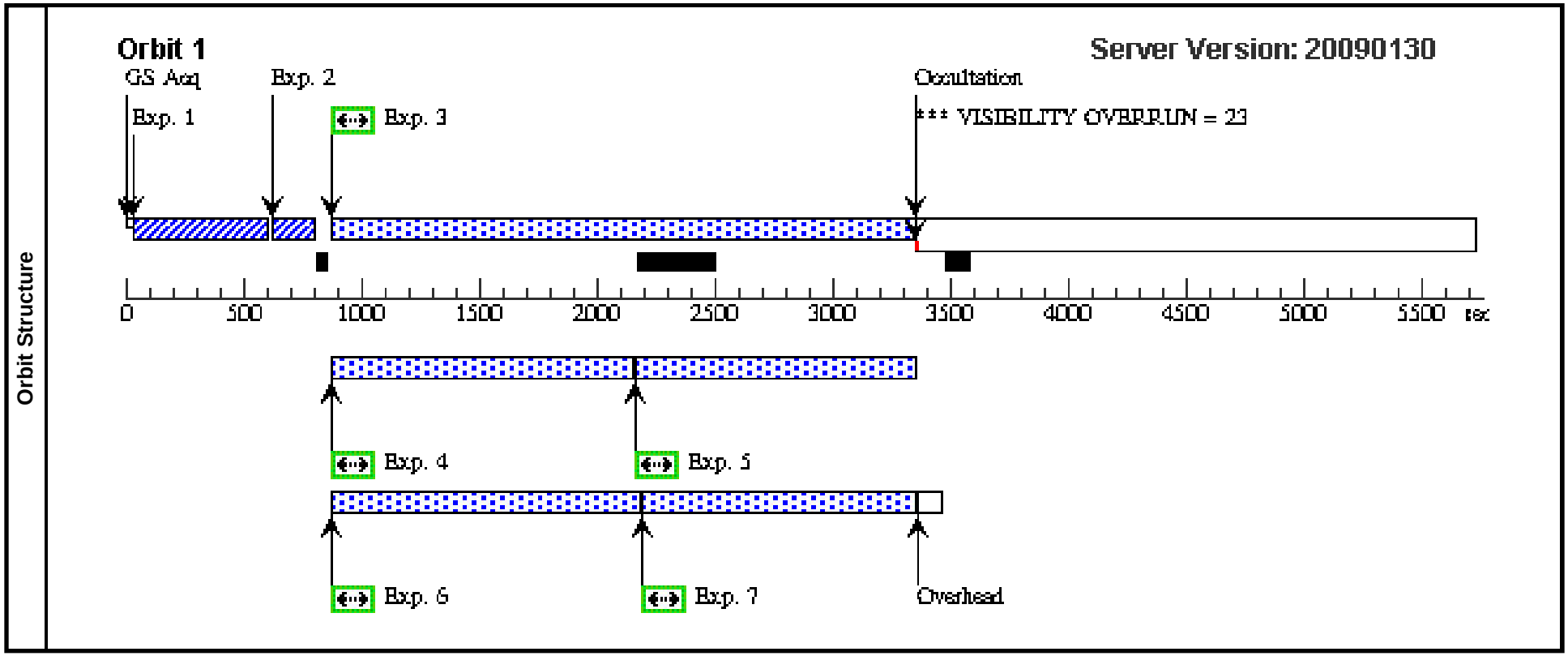
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	2MASX-J01013113+4229356	RA: 01 01 31.1600 (15.3798333d) Dec: +42 29 35.40 (42.49317d) Equinox: J2000		V=15.0+/-0.5 NUV(AB)=17.3, FUV(AB)=17.4	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(2) 2MASX-J01013113+4229356	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=2			32 Secs *[==>]*	 ***[1]***
Comments: Exposure time is 32 seconds per dwell for S/N=35 with MIRRORB. Too bright for MIRRORA. Nomalized to GALEX NUV magnitude = 17.3 in ETC.									
2		(2) 2MASX-J01013113+4229356	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				32 Secs *[==>]*	 ***[1]***
Comments: Exposure time is 32 seconds for S/N=35 with MIRRORB. Too bright for MIRRORA. Nomalized to GALEX NUV magnitude = 16.7 in ETC.									
3		(2) 2MASX-J01013113+4229356	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FLASH=YES; BUFFER-TIME=2320		Prime + Parallel Group 3-7	2320 Secs *[==>]*	 ***[1]***
Comments: Exposure yields S/N=13 at NV 1240, and S/N=10 at SiIV 1400 for GALEX(FUV)=17.4. ETC buffer time of 3692 sec set to 2400 sec.									
4		ANY	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1070 Secs *[==>]*	 ***[1]***
Comments: Parallel with COS prime									
5		ANY	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1070 Secs *[==>]*	 ***[1]***
Comments: Parallel with COS prime									
6		ANY	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1160 Secs *[==>]*	 ***[1]***
Comments: Parallel with COS prime									
7		ANY	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1160 Secs *[==>]*	 ***[1]***
Comments: Parallel with COS prime									

Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
8		(2) 2MASX-J01013113+4229356	COS/FUV, TIME-TAG, PSA	G160M 1577 A	FLASH=YES; BUFFER-TIME=2970		Prime + Parallel Group 8-12	2970 Secs *[==>]*	 ***[2]***
Comments: Using central wavelength of 1577 allows both SiIV and CIV to be observed. Exposure yields S/N=11 at CIV 1550, and S/N=12 at SiIV 1400 for GALEX(FUV)=17.4. ETC buffer time of 10008 sec set to 3000 sec.									
9		ANY	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1410 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									
10		ANY	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1410 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									
11		ANY	WFC3/UVIS, ACCUM, UVIS	F475W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1490 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									
12		ANY	WFC3/UVIS, ACCUM, UVIS	F475W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1490 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									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Server Version: 20090130
GS Acq
Exp. 1
Exp. 2
Exp. 3
Occultation
*** VISIBILITY OVERRUN = 23
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1000
1500
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4500
5000
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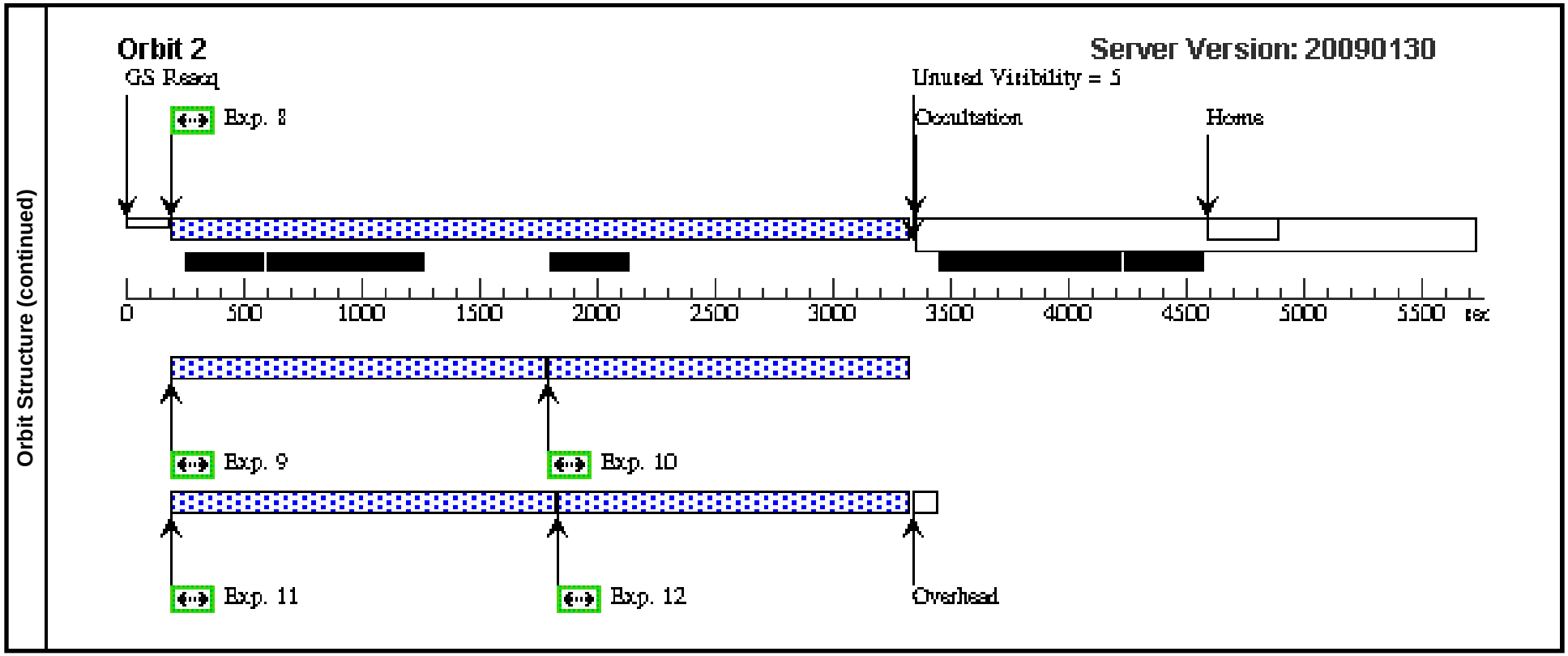
sec
Exp. 4
Exp. 5
Exp. 6
Exp. 7
Overhead


Orbit Structure (continued)
Orbit 2
Server Version: 20090130
GS Reacq
Unused Visibility = 5
Exp. 8
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec
Exp. 9
Exp. 10
Exp. 11
Exp. 12
Overhead

Visit

Proposal 11632, Visit 03, implementation Thu May 07 01:02:45 GMT 2009

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC, COS/NUV, COS/FUV, WFC3/UVIS

Special Requirements: (none)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	HS-0033+4300	RA: 00 36 22.9800 (9.0957500d) Dec: +43 16 40.30 (43.27786d) Equinox: J2000		V=18.0+/-0.5 NUV(AB)=18.2, FUV(AB)=18.4	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(3) HS-0033+4300	COS/NUV, ACQ/SEARCH, PSA	MIRRORA	SCAN-SIZE=2			10 Secs *[==>]*	***[1]***
Comments: Exposure time is 10 seconds per dwell for S/N=40 with MIRRORA. Nomalized to GALEX NUV magnitude = 18.2 in ETC.									
2		(3) HS-0033+4300	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				10 Secs *[==>]*	***[1]***
Comments: Exposure time is 10 seconds for S/N=40 with MIRRORA. Nomalized to GALEX NUV magnitude = 18.2 in ETC.									
3		(3) HS-0033+4300	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FLASH=YES; BUFFER-TIME=2455		Prime + Parallel Group 3-7	2455 Secs *[==>]*	***[1]***
Comments: Exposure yields S/N=9 at NV 1240, and S/N=7 at SiIV 1400 for GALEX(FUV)=18.2. ETC buffer time of 4600 sec set to 2500 sec.									
4		ANY	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1135 Secs *[==>]*	***[1]***
Comments: Parallel with COS prime									
5		ANY	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1135 Secs *[==>]*	***[1]***
Comments: Parallel with COS prime									
6		ANY	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1170 Secs *[==>]*	***[1]***
Comments: Parallel with COS prime									
7		ANY	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Prime + Parallel Group 3-7	1170 Secs *[==>]*	***[1]***
Comments: Parallel with COS prime									
8		(3) HS-0033+4300	COS/FUV, TIME-TAG, PSA	G160M 1577 A	FLASH=YES; BUFFER-TIME=2975		Prime + Parallel Group 8-12	2975 Secs *[==>]*	***[2]***
Comments: Using central wavelength of 1577 allows both SiIV and CIV to be observed. Exposure yields S/N=8 at CIV 1550, and S/N=9 at SiIV 1400 for GALEX(FUV)=18.2. ETC buffer time of 18732 sec set to 3100 sec.									

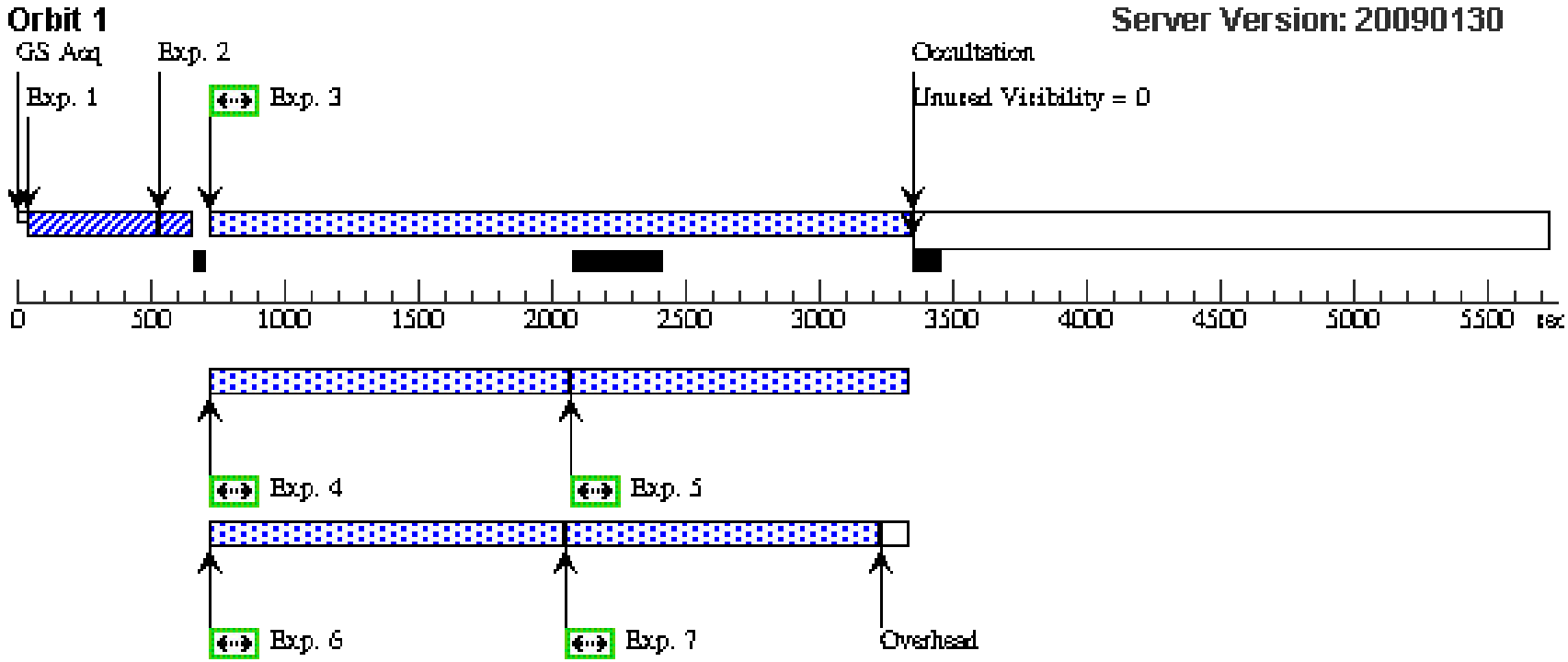
Exposures (continued)

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
9		ANY	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1410 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									
10		ANY	ACS/WFC, ACCUM, WFCENTER	F814W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1410 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									
11		ANY	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1450 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									
12		ANY	WFC3/UVIS, ACCUM, UVIS	F814W	CR-SPLIT=NO		Prime + Parallel Group 8-12	1450 Secs *[==>]*	 ***[2]***
Comments: Parallel with COS prime									
13		(3) HS-0033+4300	COS/FUV, TIME-TAG, PSA	G160M 1577 A	FLASH=YES; BUFFER-TIME=3085		Prime + Parallel Group 13-17	3085 Secs *[==>]*	 ***[3]***
Comments: Using central wavelength of 1577 allows both SiIV and CIV to be observed. Exposure yields S/N=9 at CIV 1550, and S/N=10 at SiIV 1400 for GALEX(FUV)=18.2. ETC buffer time of 18732 sec set to 3100 sec.									
14		ANY	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO		Prime + Parallel Group 13-17	1410 Secs *[==>]*	 ***[3]***
Comments: Parallel with COS prime									
15		ANY	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=NO		Prime + Parallel Group 13-17	1410 Secs *[==>]*	 ***[3]***
Comments: Parallel with COS prime									
16		ANY	WFC3/UVIS, ACCUM, UVIS	F475W	CR-SPLIT=NO		Prime + Parallel Group 13-17	1450 Secs *[==>]*	 ***[3]***
Comments: Parallel with COS prime									
17		ANY	WFC3/UVIS, ACCUM, UVIS	F475W	CR-SPLIT=NO		Prime + Parallel Group 13-17	1450 Secs *[==>]*	 ***[3]***
Comments: Parallel with COS prime									
18		(3) HS-0033+4300	COS/FUV, TIME-TAG, PSA	G160M 1577 A	FLASH=YES; BUFFER-TIME=3085		Prime + Parallel Group 18-22	3085 Secs *[==>]*	 ***[4]***
Comments: Using central wavelength of 1577 allows both SiIV and CIV to be observed. Exposure yields S/N=9 at CIV 1550, and S/N=10 at SiIV 1400 for GALEX(FUV)=18.2. ETC buffer time of 18732 sec set to 3100 sec.									
19		ANY	ACS/WFC, ACCUM, WFCENTER	F606W	CR-SPLIT=NO		Prime + Parallel Group 18-22	1410 Secs *[==>]*	 ***[4]***
Comments: Parallel with COS prime									

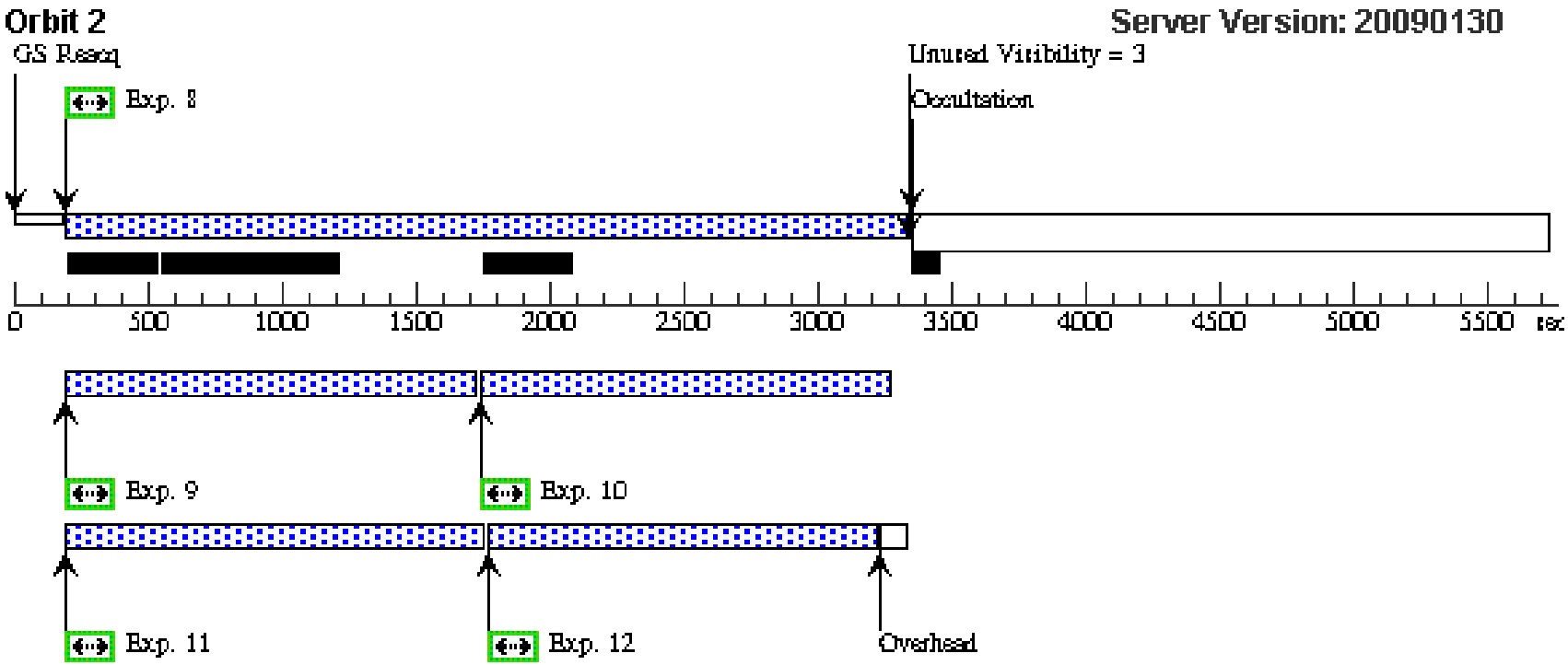
Exposures (continued)

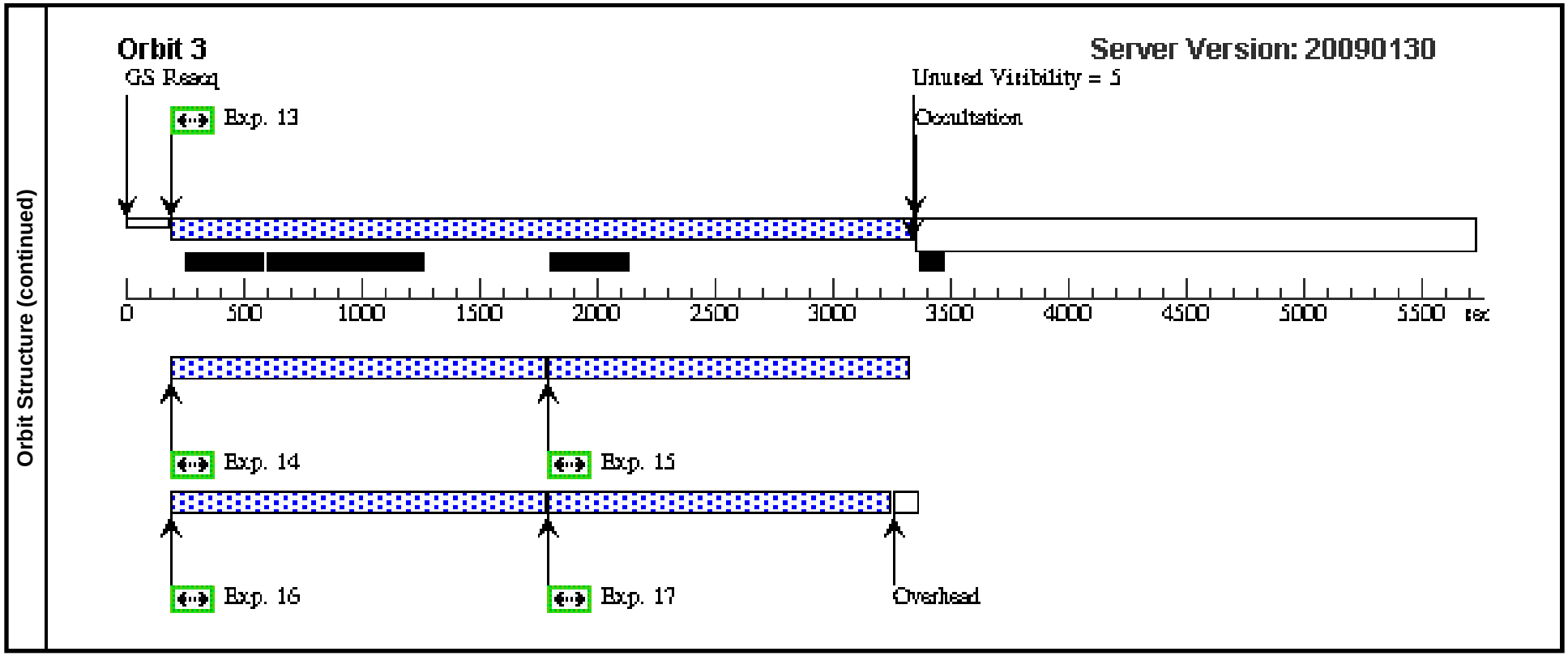
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
20		ANY	ACS/WFC, ACCUM, WFC	F606W	CR-SPLIT=NO		Prime + Parallel Group 18-22	1410 Secs	
								[==>]	***[4]***
Comments: Parallel with COS prime									
21		ANY	WFC3/UVIS, ACCUM, UVIS	F475W	CR-SPLIT=NO		Prime + Parallel Group 18-22	1450 Secs	
								[==>]	***[4]***
Comments: Parallel with COS prime									
22		ANY	WFC3/UVIS, ACCUM, UVIS	F475W	CR-SPLIT=NO		Prime + Parallel Group 18-22	1450 Secs	
								[==>]	***[4]***
Comments: Parallel with COS prime									

Orbit Structure



Orbit Structure (continued)




Orbit Structure (continued)
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GS Reacq
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Occultation
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sec
Exp. 14
Exp. 15
Exp. 16
Exp. 17
Overhead

Orbit Structure (continued)