



13410 - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Cycle: 21, 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) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:07:21.0	yes
02	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:07:30.0	yes
03	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:07:37.0	yes

Proposal 13410 (STScI Edit Number: 0, Created: Monday, September 16, 2013 8:09:02 PM EST) - Overview

<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>
04	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:07:44.0	yes
05	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:07:51.0	yes
06	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:07:58.0	yes
07	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:08:04.0	yes
08	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:08:10.0	yes
09	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:08:17.0	yes
10	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:08:23.0	yes
11	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:08:30.0	yes
12	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:08:36.0	yes
13	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:08:42.0	yes
14	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:08:48.0	yes
15	(1) PSR6440B ANY	ACS/WFC WFC3/UVIS	1	16-Sep-2013 21:08:55.0	yes

15 Total Orbits Used

ABSTRACT

Proposal 13410 (STScI Edit Number: 0, Created: Monday, September 16, 2013 8:09:02 PM EST) - Overview

The observed radio properties of the binary millisecond pulsar PSR 6440B in the globular cluster NGC 6440 suggests that the neutron star (NS) could be as massive as 2.7 Msun. If confirmed, such a large value would severely challenge most of the equations of state of dense matter and put strong constraints to the formation scenarios of supermassive NSs. To confirm the expected value it is mandatory to identify the companion star to this unique object.

From the analysis of Cycle 19 WFC3 images, we identified a promising candidate companion: it is a Blue Straggler Star (BSS) showing optical variability seemingly consistent with the orbital period of the system ($P=20.55$ d). However these data do not allow to precisely determine the BSS variability period and verify whether it coincides with the orbital period of the pulsar.

Here we propose to perform time-resolved WFC3 observations in order to derive the BSS light curve with a temporal sampling appropriate for precisely and univocally establish its period and assess its coincidence with the pulsar orbital period. Once the candidate is confirmed, the light curve shape will constrain the orbital inclination and the mass ratio of the system. In turn, together with the companion mass estimated from stellar evolutionary tracks, this will yield the first direct estimate of the NS mass.

Note that the prohibitive crowding conditions in the vicinity of the BSS prevent any attempt to perform ground-based observations or spectroscopic follow-ups. Hence the proposed project represents the only viable approach to solve the case of PSR 6440B, potentially leading to the discovery of the first known case of a BSS orbiting a MSP.

OBSERVING DESCRIPTION

Observations are organized in 15 visits of 1 orbit each. The visits are grouped in 3 groups in order to properly sample different epochs of the target orbital period.

In each orbit (with the only exception of the last two, where 2 short exposures are also planned in order to sample the bright population of the globular cluster), 2 long exposures in the optical filters F606W and F814W and 1 long exposure in the narrow filter F656N (CR-SPLIT=2) are planned.

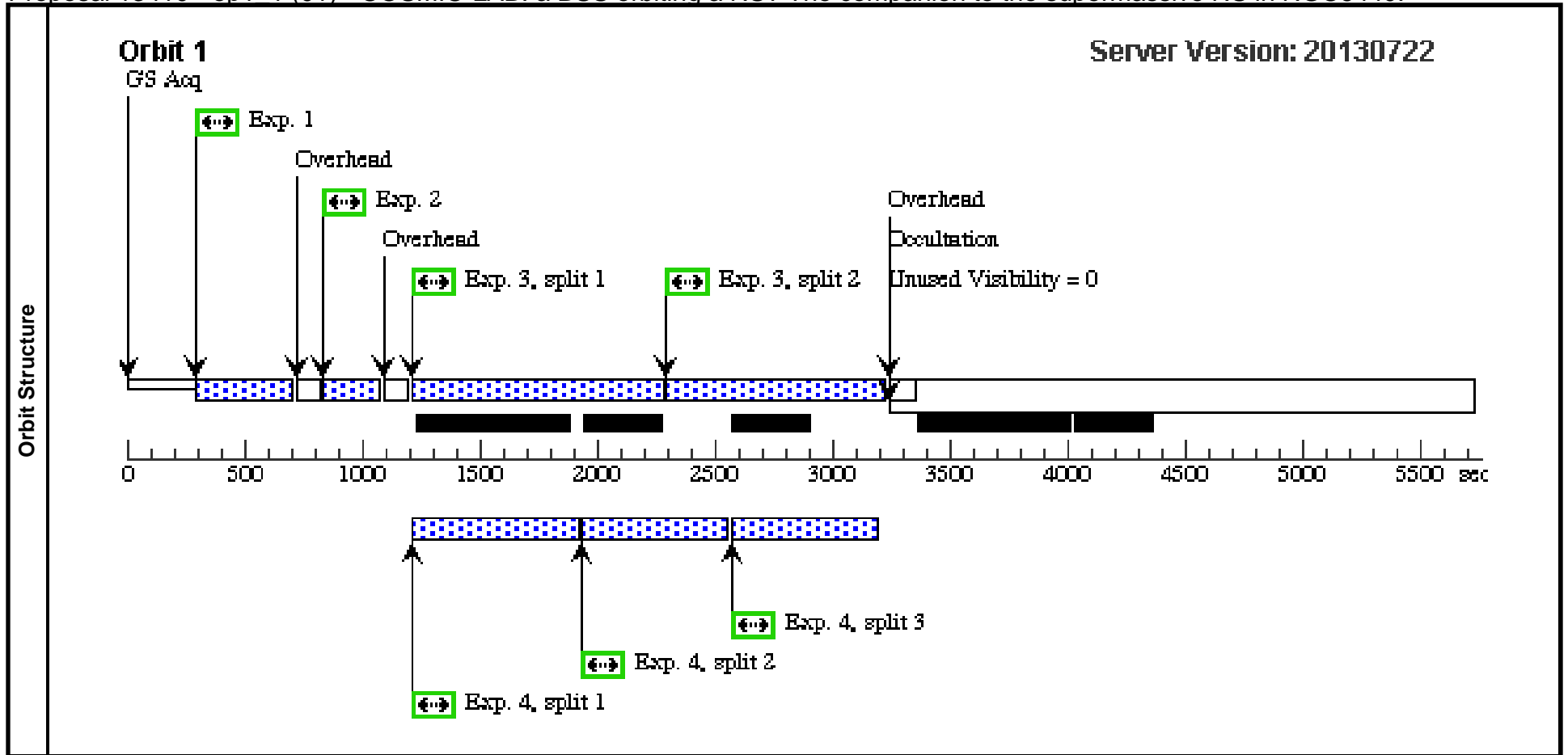
Dithering is performed by applying small offsets (via POS TARG keyword) to each exposure using a path already tested in the past. The target is located at the aperture UVIS1; with this configuration we are also able to sample the entire cluster core. We used appropriate visit orientation requirements in order to avoid contamination of spikes of a bright star close to the target.

Parallel exposures with ACS/WFC (in F606W and F814W filters) are planned in each orbit.

Proposal 13410 - ep1_1 (01) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:03 GMT 2013

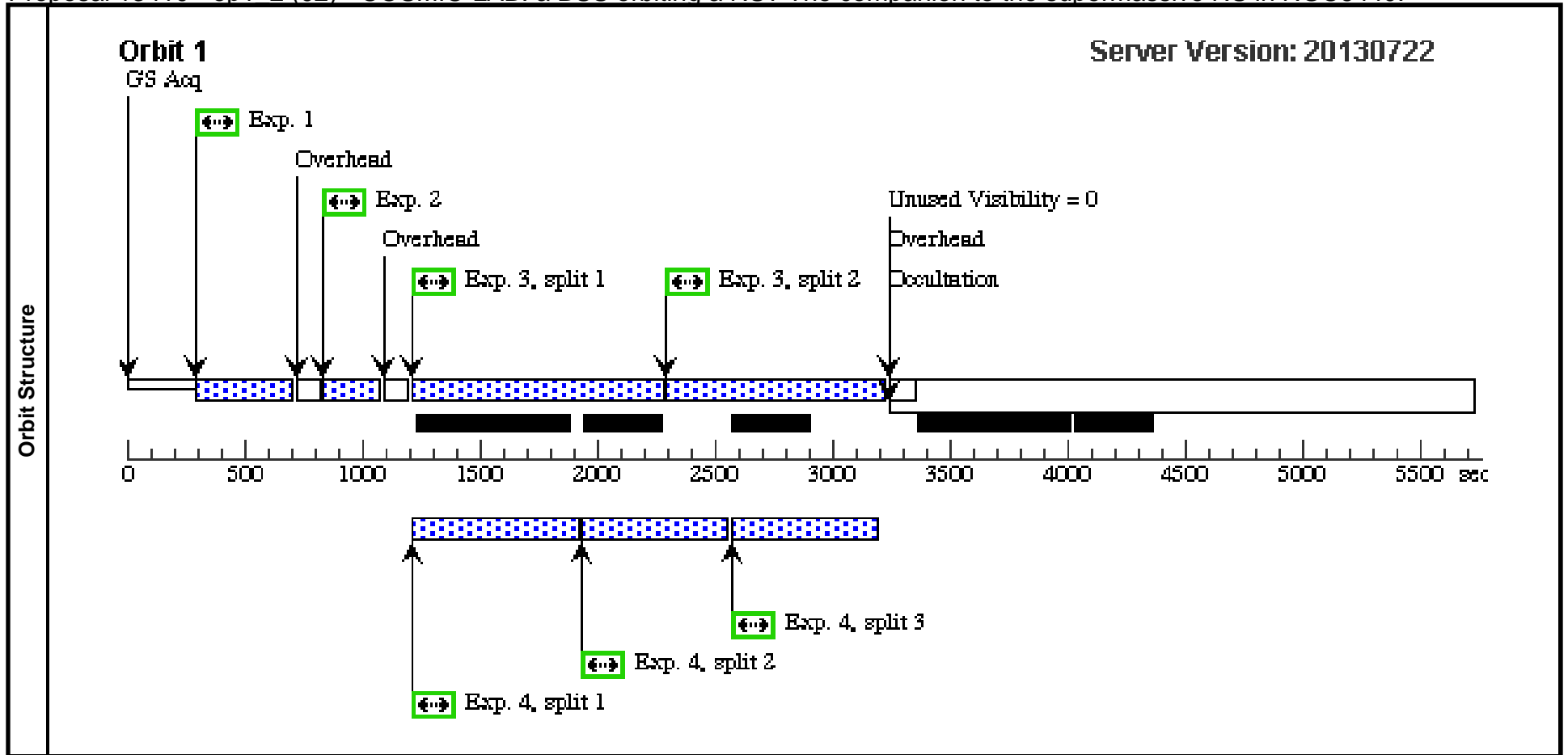
Visit	<p>Proposal 13410, ep1_1 (01), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS, ACS/WFC</p> <p>Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D</p> <p><i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i></p> <p><i>However for safety we report here the coordinates of the two stars:</i></p> <p><i>Target: R.A.=267.2205266 Dec=-20.3605934 (J2000)</i></p> <p><i>Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)</i></p>																				
	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>PSR6440B</td> <td>RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000</td> <td></td> <td>V=21.5</td> <td>Reference Frame: ICRS</td> </tr> </tbody> </table>										#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5
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Fixed Targets																					
	Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit										
		1	ep1_V1	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W				382 Secs (382 Secs)											
										[==>]	[1]										
		2	ep1_I1	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W				222 Secs (222 Secs)											
									[==>]	[1]											
3	ep1_Ha1	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N		CR-SPLIT=2; FLASH=12		Prime + Parallel Group 3-4 in ep1_1 (01)	1868 Secs (1868 Secs)												
									[==>(Split 1)]	[1]											
									[==>(Split 2)]												
4	ep1_par1	ANY	ACS/WFC, ACCUM, WFC1	F606W		CR-SPLIT=3		Prime + Parallel Group 3-4 in ep1_1 (01)	1500 Secs (1500 Secs)												
									[==>(Split 1)]												
									[==>(Split 2)]	[1]											
									[==>(Split 3)]												



Proposal 13410 - ep1_2 (02) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:05 GMT 2013

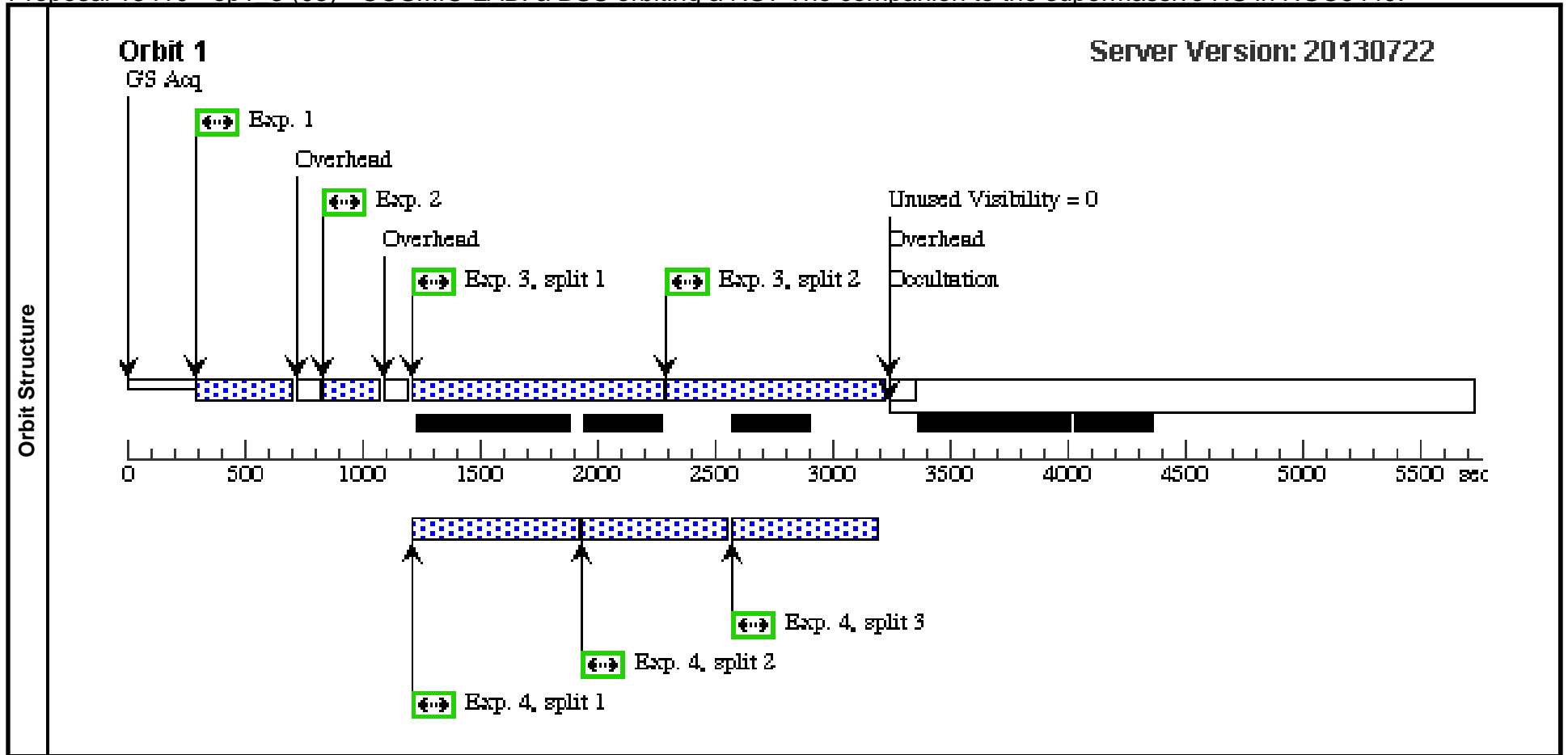
Visit	<p>Proposal 13410, ep1_2 (02), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS, ACS/WFC</p> <p>Special Requirements: ORIENT 8D TO 128 D; ORIENT 138D TO 308 D; AFTER 01 BY 1.50 D TO 1.92 D</p> <p><i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i></p> <p><i>However for safety we report here the coordinates of the two stars:</i></p> <p><i>Target: R.A.=267.2205266 Dec=-20.3605934 (J2000)</i></p> <p><i>Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)</i></p>																				
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#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																
(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS																
Fixed Targets																					
	Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit										
		1	ep1_V2	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG -0.099,-0.165		382 Secs (382 Secs)											
										[==>]	[1]										
		2	ep1_I2	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		SAME POS AS 1		222 Secs (222 Secs)											
									[==>]	[1]											
3	ep1_Ha2	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N	CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Group 3-4 in ep1_2 (02)	1868 Secs (1868 Secs)													
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								[==>(Split 2)]													
4	ep1_par2	ANY	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=3		Prime + Parallel Group 3-4 in ep1_2 (02)	1500 Secs (1500 Secs)													
								[==>(Split 1)]													
								[==>(Split 2)]	[1]												
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Proposal 13410 - ep1_3 (03) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:06 GMT 2013

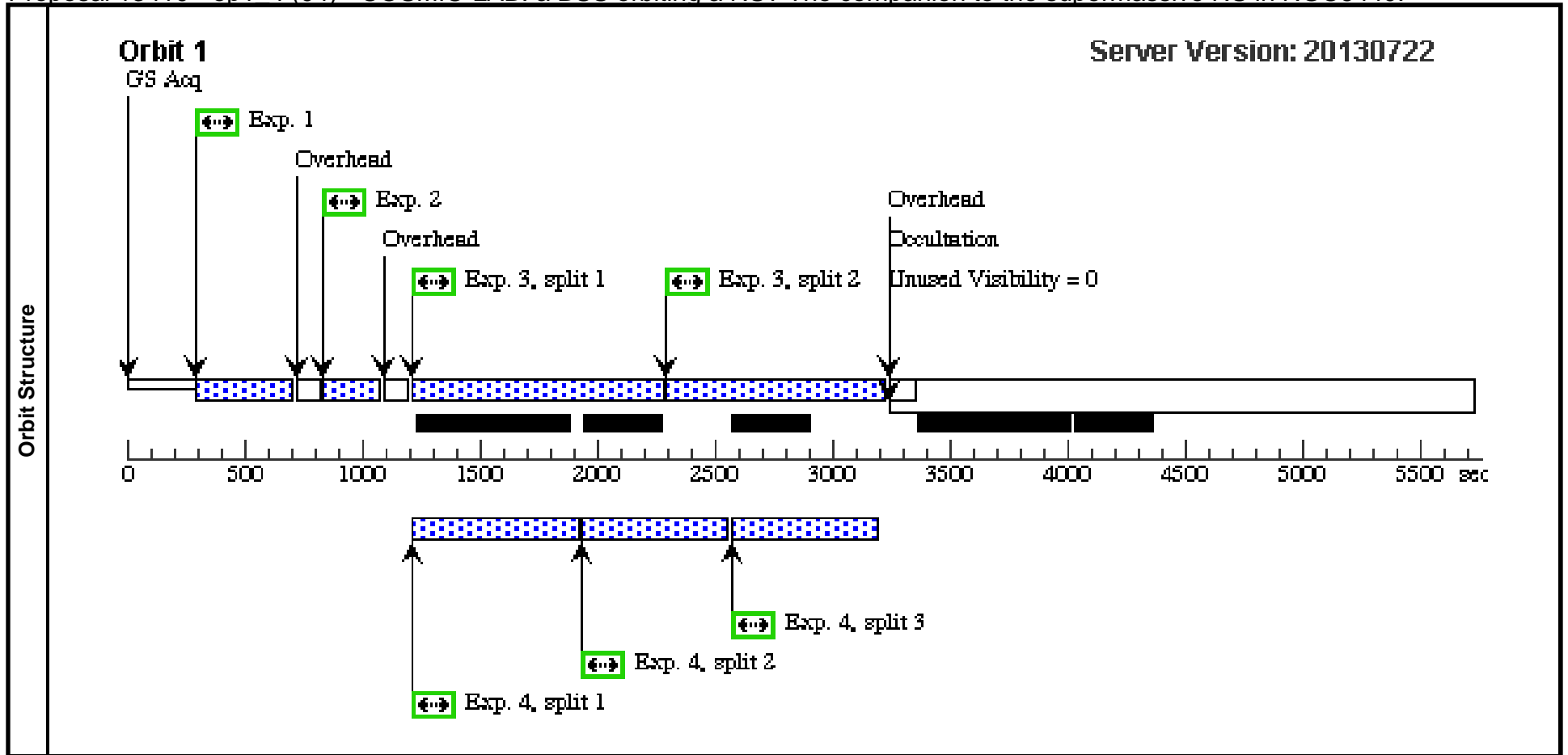
Visit	<p>Proposal 13410, ep1_3 (03), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS, ACS/WFC</p> <p>Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 01 BY 3.22 D TO 3.64 D</p> <p><i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i></p> <p><i>However for safety we report here the coordinates of the two stars:</i></p> <p><i>Target: R.A.=267.2205266 Dec=-20.3605934 (J2000)</i></p> <p><i>Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)</i></p>																				
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#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																
(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS																
Fixed Targets																					
	Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit										
		1	ep1_V3	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG 0.059,-0.095		382 Secs (382 Secs)											
										[==>]	[1]										
		2	ep1_I3	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		SAME POS AS 1		222 Secs (222 Secs)											
									[==>]	[1]											
3	ep1_Ha3	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N	CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Group 3-4 in ep1_3 (03)	1868 Secs (1868 Secs)													
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								[==>(Split 2)]													
4	ep1_par3	ANY	ACS/WFC, ACCUM, WFC1	F606W	CR-SPLIT=3		Prime + Parallel Group 3-4 in ep1_3 (03)	1500 Secs (1500 Secs)													
								[==>(Split 1)]													
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Proposal 13410 - ep1_4 (04) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:07 GMT 2013

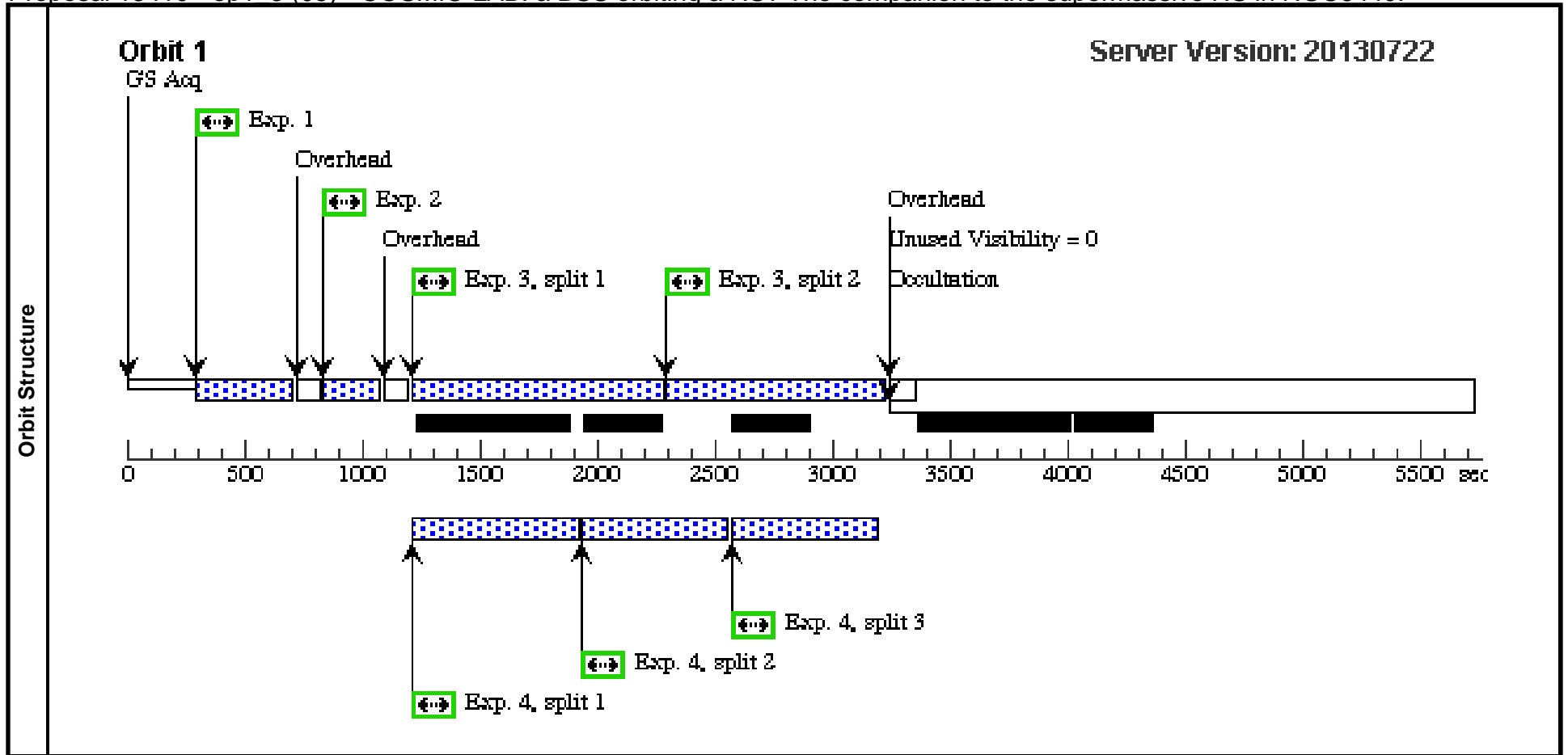
Visit	<p>Proposal 13410, ep1_4 (04), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS, ACS/WFC</p> <p>Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 01 BY 4.93 D TO 5.35 D</p> <p><i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i></p> <p><i>However for safety we report here the coordinates of the two stars:</i></p> <p><i>Target: R.A.=267.2205266 Dec=-20.3605934 (J2000)</i></p> <p><i>Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)</i></p>																				
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(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS																
Fixed Targets																					
	Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit										
		1	ep1_V4	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG 0.218,-0.024		382 Secs (382 Secs)											
										[==>]	[1]										
		2	ep1_I4	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		SAME POS AS 1		222 Secs (222 Secs)											
									[==>]	[1]											
3	ep1_Ha4	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N		CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Group 3-4 in ep1_4 (04)	1868 Secs (1868 Secs)												
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									[==>(Split 2)]												
4	ep1_par4	ANY	ACS/WFC, ACCUM, WFC1	F814W		CR-SPLIT=3		Prime + Parallel Group 3-4 in ep1_4 (04)	1500 Secs (1500 Secs)												
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									[==>(Split 2)]	[1]											
									[==>(Split 3)]												



Proposal 13410 - ep1_5 (05) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:08 GMT 2013

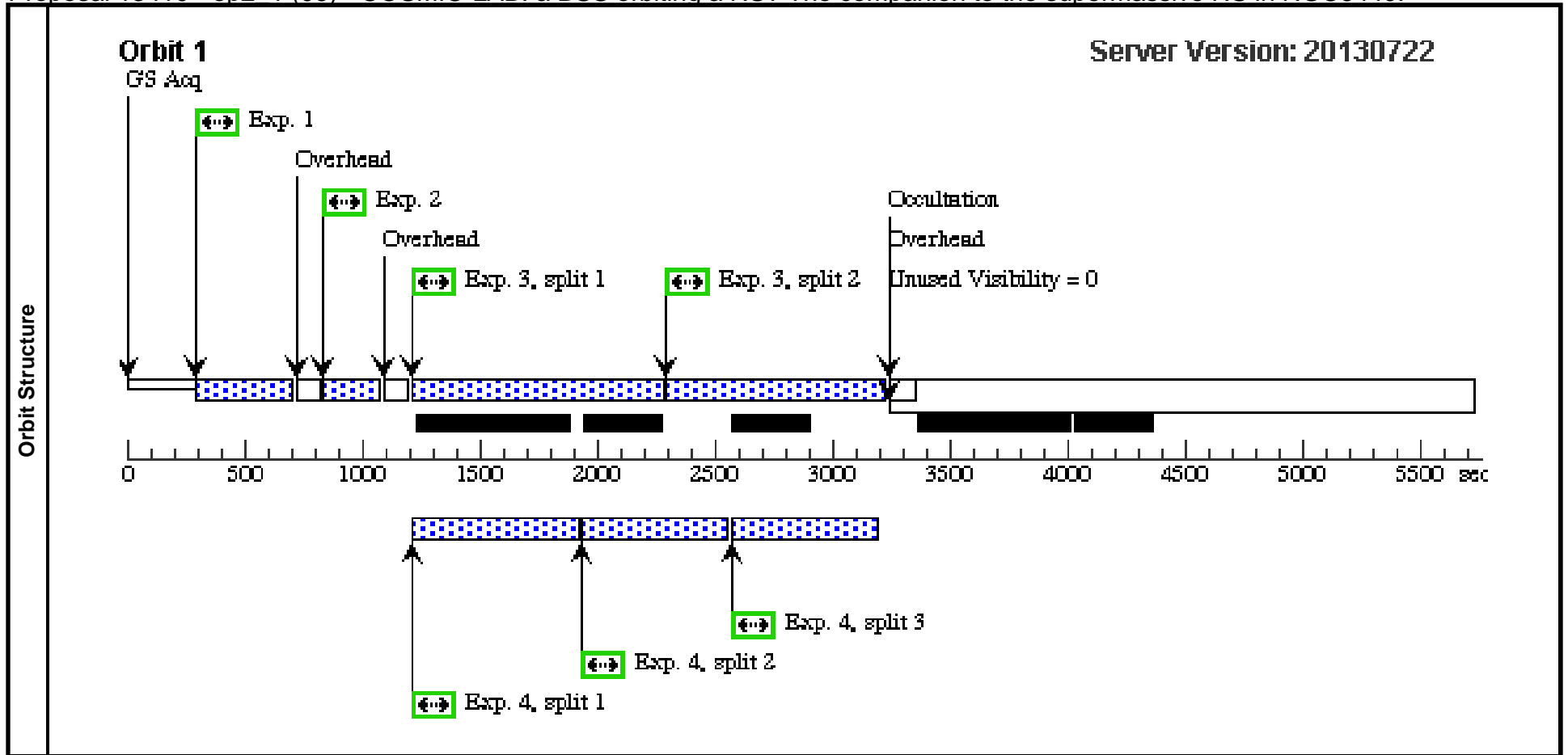
Visit	<p>Proposal 13410, ep1_5 (05), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS, ACS/WFC</p> <p>Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 01 BY 6.64 D TO 7.06 D</p> <p><i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i></p> <p><i>However for safety we report here the coordinates of the two stars:</i></p> <p><i>Target: R.A.=267.2205266 Dec=-20.3605934 (J2000)</i></p> <p><i>Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)</i></p>																				
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#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																
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	Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit										
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		2	ep1_I5	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		SAME POS AS 1		222 Secs (222 Secs)											
									[==>]	[1]											
3	ep1_Ha5	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N		CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Group 3-4 in ep1_5 (05)	1868 Secs (1868 Secs)												
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									[==>(Split 2)]												
4	ep1_par5	ANY	ACS/WFC, ACCUM, WFC1	F606W		CR-SPLIT=3		Prime + Parallel Group 3-4 in ep1_5 (05)	1500 Secs (1500 Secs)												
									[==>(Split 1)]												
									[==>(Split 2)]	[1]											
									[==>(Split 3)]												



Proposal 13410 - ep2_1 (06) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:09 GMT 2013

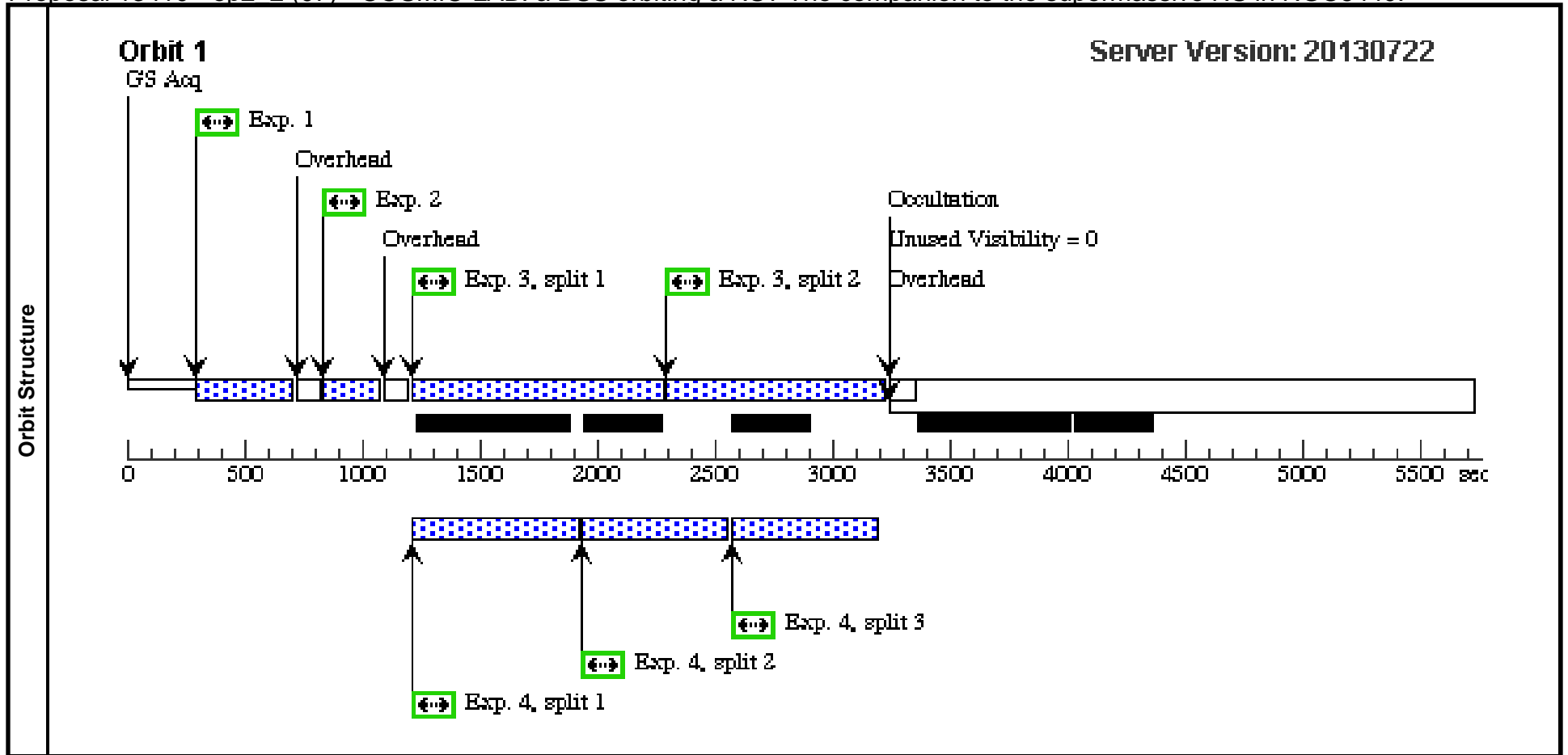
Visit	<p>Proposal 13410, ep2_1 (06), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS, ACS/WFC</p> <p>Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 05 BY 205.3 D TO 205.7 D</p> <p><i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i></p> <p><i>However for safety we report here the coordinates of the two stars:</i></p> <p><i>Target: R.A.=267.2205266 Dec=-20.3605934 (J2000)</i></p> <p><i>Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)</i></p>																				
	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>PSR6440B</td> <td>RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000</td> <td></td> <td>V=21.5</td> <td>Reference Frame: ICRS</td> </tr> </tbody> </table>										#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																
(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS																
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit											
	1	ep2_V1	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG 0.099,0.165		382 Secs (382 Secs)												
									[==>]	[1]											
	2	ep2_I1	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W			SAME POS AS 1	222 Secs (222 Secs)												
									[==>]	[1]											
3	ep2_Ha1	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N		CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Group 3-4 in ep2_1 (06)	1868 Secs (1868 Secs)												
									[==>(Split 1)]	[1]											
									[==>(Split 2)]												
4	ep2_par1	ANY	ACS/WFC, ACCUM, WFC1	F814W		CR-SPLIT=3		Prime + Parallel Group 3-4 in ep2_1 (06)	1500 Secs (1500 Secs)												
									[==>(Split 1)]												
									[==>(Split 2)]	[1]											
									[==>(Split 3)]												



Proposal 13410 - ep2_2 (07) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:09 GMT 2013

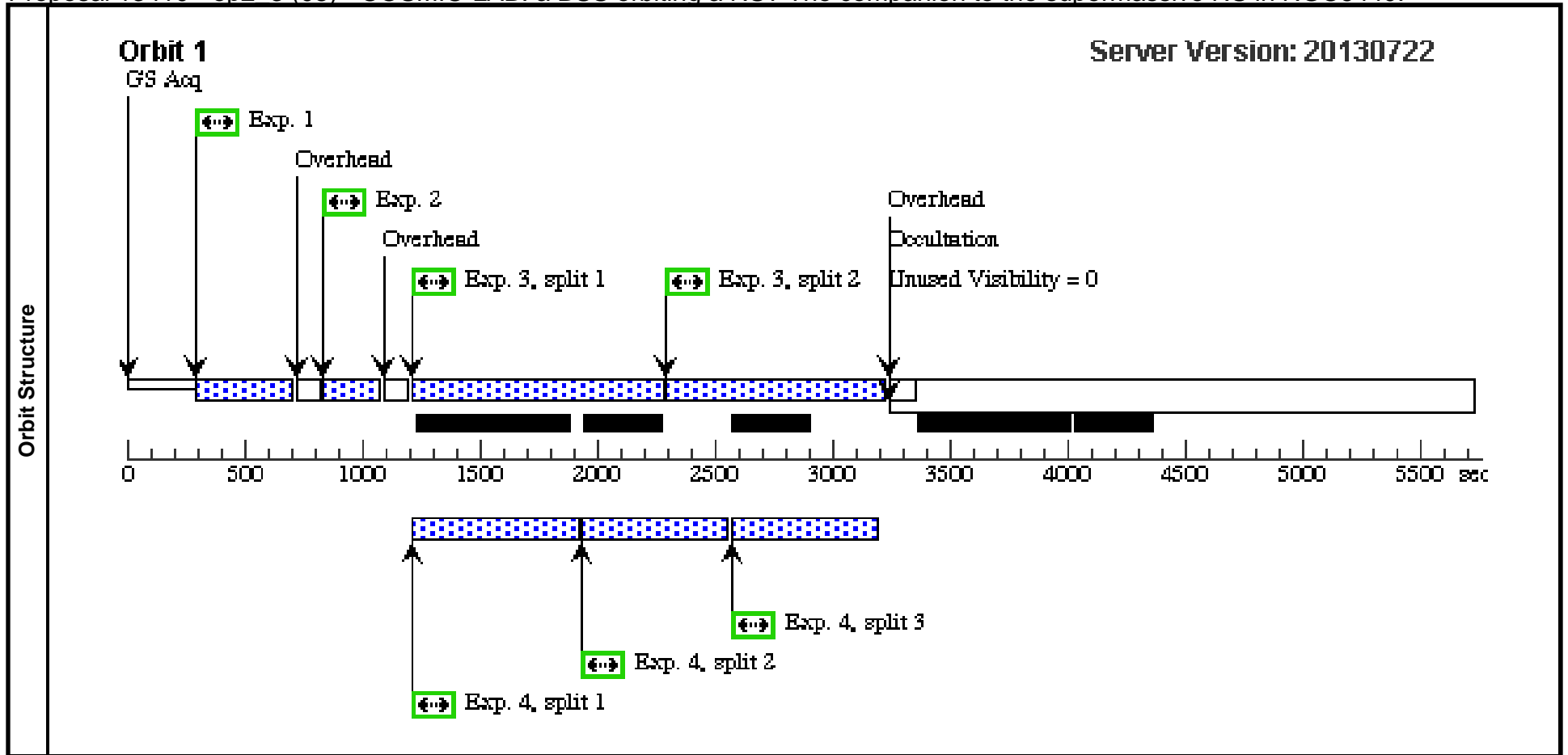
Visit	<p>Proposal 13410, ep2_2 (07), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS, ACS/WFC</p> <p>Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 06 BY 1.50 D TO 1.92 D</p> <p><i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i></p> <p><i>However for safety we report here the coordinates of the two stars:</i></p> <p><i>Target: R.A.=267.2205266 Dec=-20.3605934 (J2000)</i></p> <p><i>Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)</i></p>									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
(1)		PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ep2_V2	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG -0.059,0 .095		382 Secs (382 Secs)	
									[==>]	[1]
	2	ep2_I2	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		SAME POS AS 1		222 Secs (222 Secs)	
									[==>]	[1]
3	ep2_Ha2	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N	CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Gro up 3-4 in ep2_2 (07)	1868 Secs (1868 Secs)		
								[==>(Split 1)]	[1]	
								[==>(Split 2)]		
4	ep2_par2	ANY	ACS/WFC, ACCUM, WFC1	F606W	CR-SPLIT=3		Prime + Parallel Gro up 3-4 in ep2_2 (07)	1500 Secs (1500 Secs)		
								[==>(Split 1)]		
								[==>(Split 2)]	[1]	
								[==>(Split 3)]		



Proposal 13410 - ep2_3 (08) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:10 GMT 2013

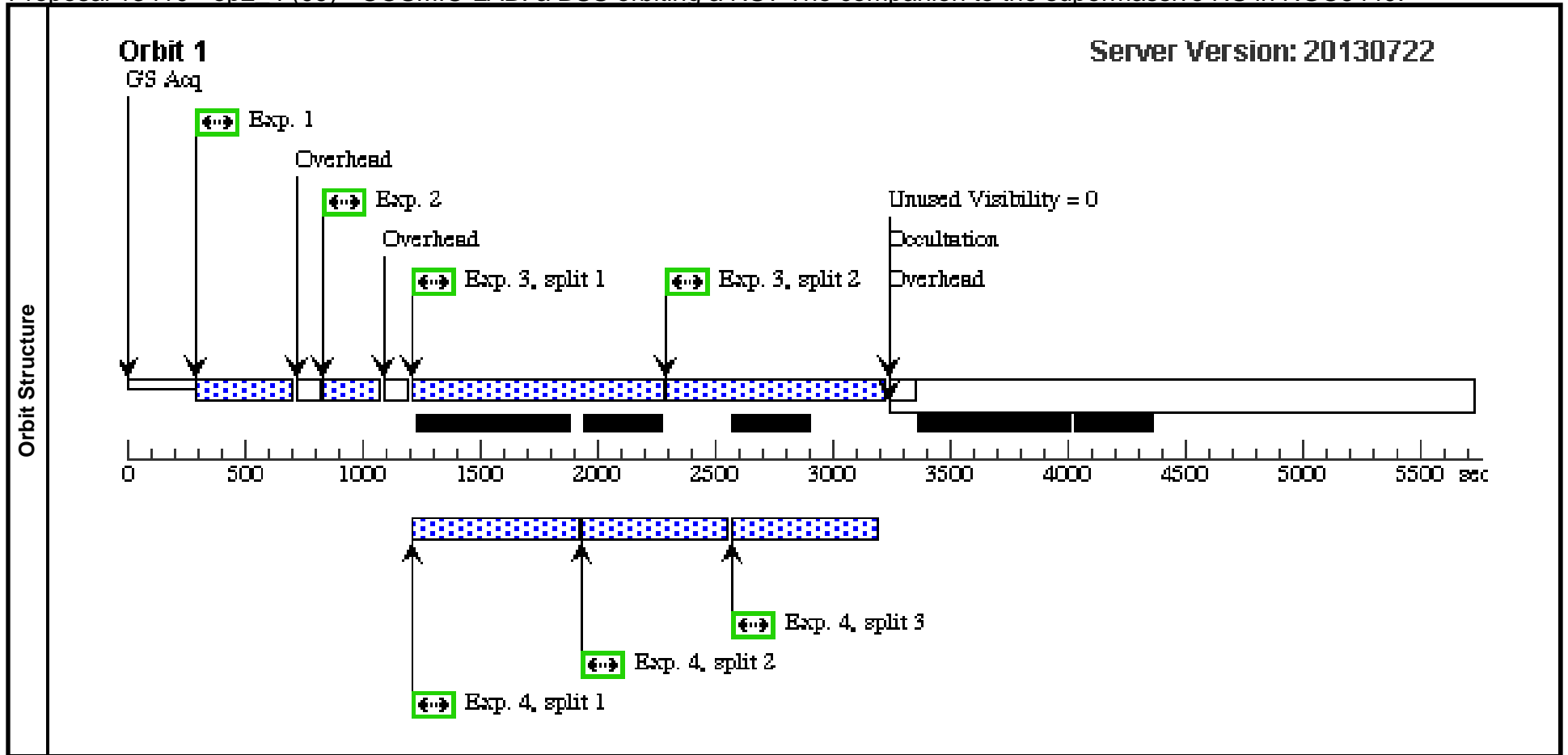
Visit	<p>Proposal 13410, ep2_3 (08), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS, ACS/WFC</p> <p>Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 06 BY 3.22 D TO 3.64 D</p> <p><i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i></p> <p><i>However for safety we report here the coordinates of the two stars:</i></p> <p><i>Target: R.A.=267.2205266 Dec=-20.3605934 (J2000)</i></p> <p><i>Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)</i></p>																				
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#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																
(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS																
Fixed Targets																					
	Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit										
		1	ep2_V3	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG -0.218,0 .024		382 Secs (382 Secs)											
										[==>]	[1]										
		2	ep2_I3	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		SAME POS AS 1		222 Secs (222 Secs)											
									[==>]	[1]											
3	ep2_Ha3	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N	CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Gro up 3-4 in ep2_3 (08)	1868 Secs (1868 Secs)													
								[==>(Split 1)]	[1]												
								[==>(Split 2)]													
4	ep2_par3	ANY	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=3		Prime + Parallel Gro up 3-4 in ep2_3 (08)	1500 Secs (1500 Secs)													
								[==>(Split 1)]													
								[==>(Split 2)]	[1]												
								[==>(Split 3)]													



Proposal 13410 - ep2_4 (09) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:11 GMT 2013

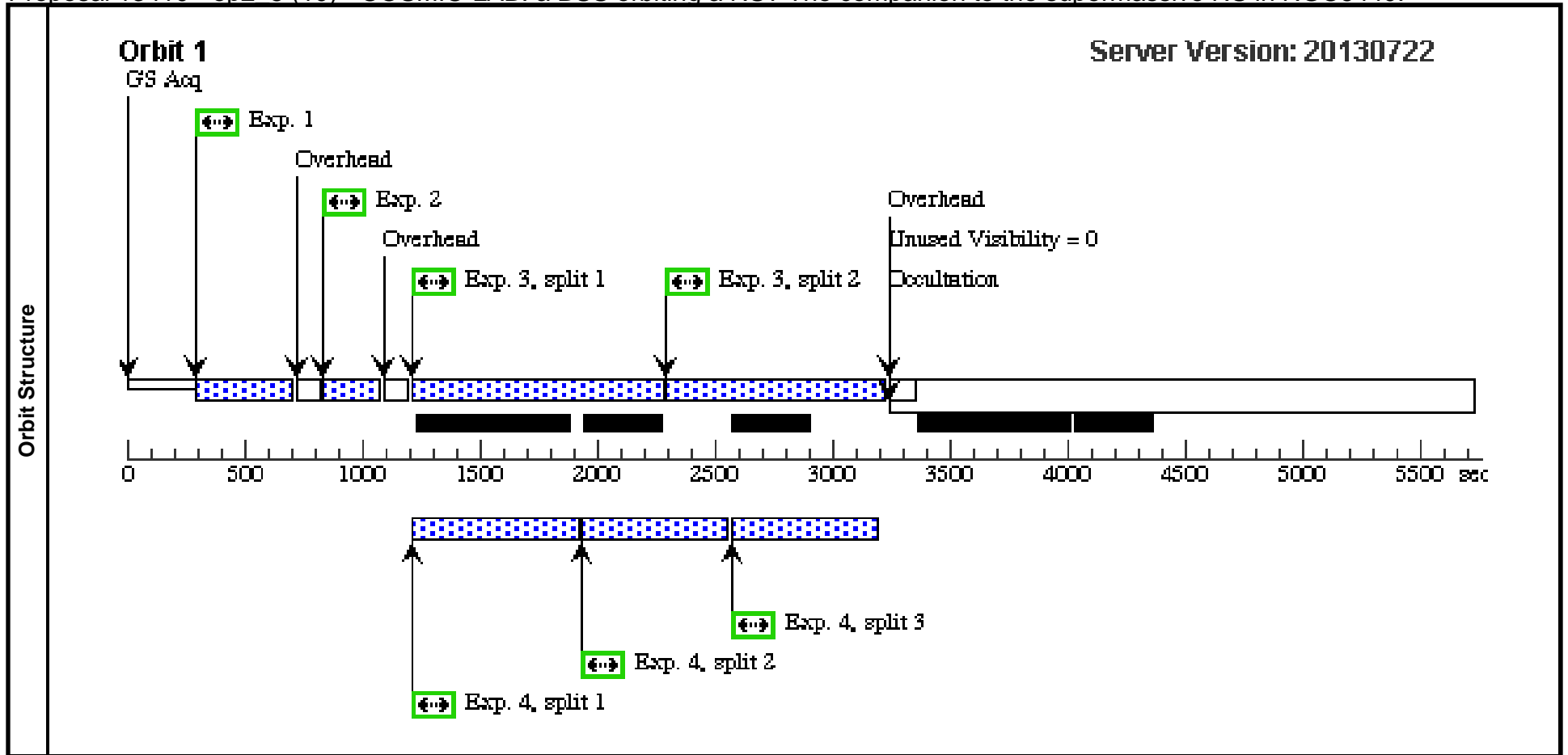
Visit	<p>Proposal 13410, ep2_4 (09), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS, ACS/WFC</p> <p>Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 06 BY 4.93 D TO 5.35 D</p> <p><i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i></p> <p><i>However for safety we report here the coordinates of the two stars:</i></p> <p><i>Target: R.A.=267.2205266 Dec=-20.3605934 (J2000)</i></p> <p><i>Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)</i></p>																				
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#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																
(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS																
Fixed Targets																					
	Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit										
		1	ep2_V4	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG -0.158,-0.070		382 Secs (382 Secs)											
										[==>]	[1]										
		2	ep2_I4	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		SAME POS AS 1		222 Secs (222 Secs)											
									[==>]	[1]											
3	ep2_Ha4	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N	CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Group 3-4 in ep2_4 (09)	1868 Secs (1868 Secs)													
								[==>(Split 1)]	[1]												
								[==>(Split 2)]													
4	ep2_par4	ANY	ACS/WFC, ACCUM, WFC1	F606W	CR-SPLIT=3		Prime + Parallel Group 3-4 in ep2_4 (09)	1500 Secs (1500 Secs)													
								[==>(Split 1)]													
								[==>(Split 2)]	[1]												
								[==>(Split 3)]													



Proposal 13410 - ep2_5 (10) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:12 GMT 2013

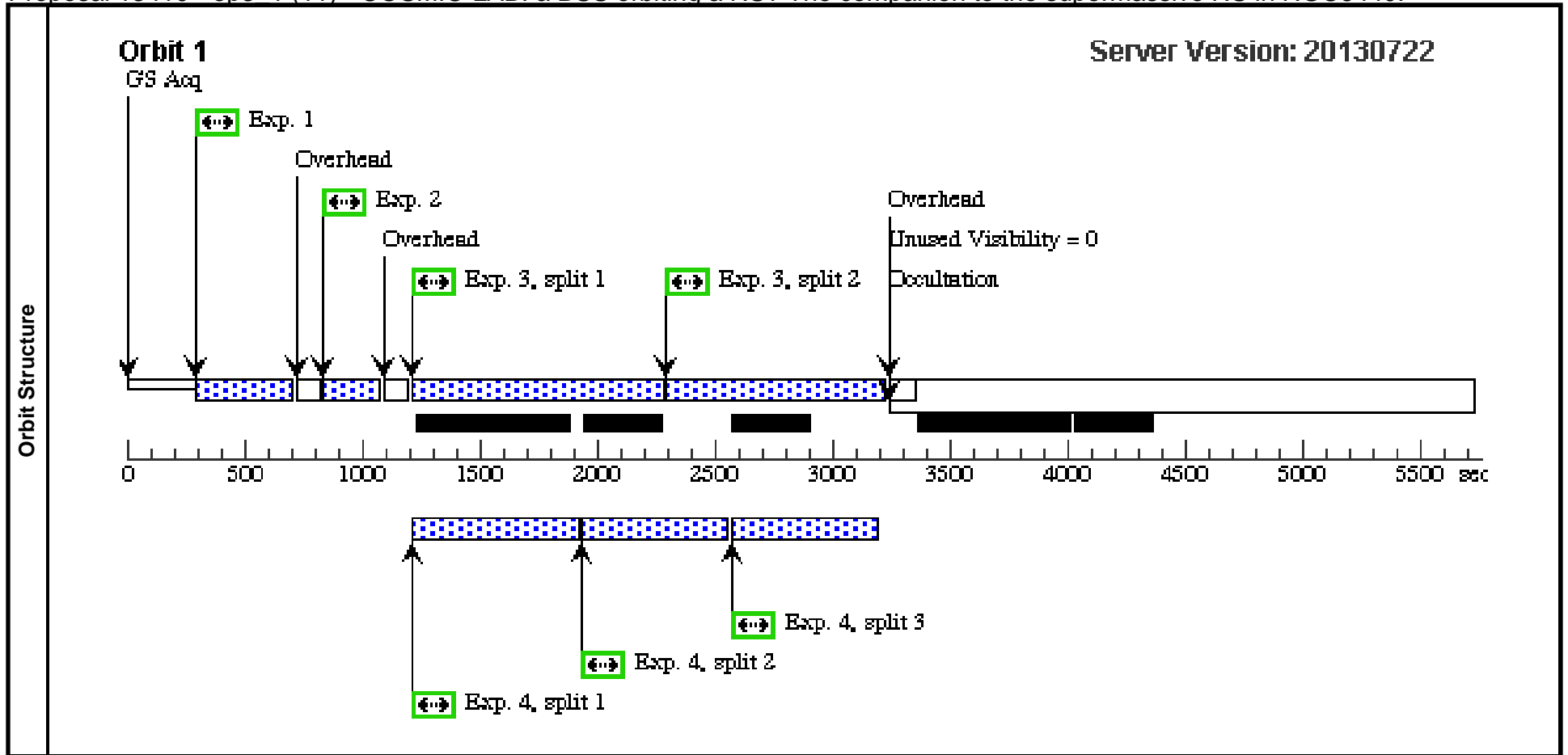
Visit	<p>Proposal 13410, ep2_5 (10), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS, ACS/WFC</p> <p>Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 06 BY 6.64 D TO 7.06 D</p> <p><i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i></p> <p><i>However for safety we report here the coordinates of the two stars:</i></p> <p><i>Target: R.A.=267.2205266 Dec=-20.3605934 (J2000)</i></p> <p><i>Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)</i></p>																				
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#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																
(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS																
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit											
	1	ep2_V5	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG -0.158,-0.110		382 Secs (382 Secs)												
									[==>]	[1]											
	2	ep2_I5	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W			SAME POS AS 1	222 Secs (222 Secs)												
									[==>]	[1]											
3	ep2_Ha5	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N		CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Group 3-4 in ep2_5 (10)	1868 Secs (1868 Secs)												
									[==>(Split 1)]	[1]											
									[==>(Split 2)]												
4	ep2_par5	ANY	ACS/WFC, ACCUM, WFC1	F814W		CR-SPLIT=3		Prime + Parallel Group 3-4 in ep2_5 (10)	1500 Secs (1500 Secs)												
									[==>(Split 1)]												
									[==>(Split 2)]	[1]											
									[==>(Split 3)]												



Proposal 13410 - ep3_1 (11) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:12 GMT 2013

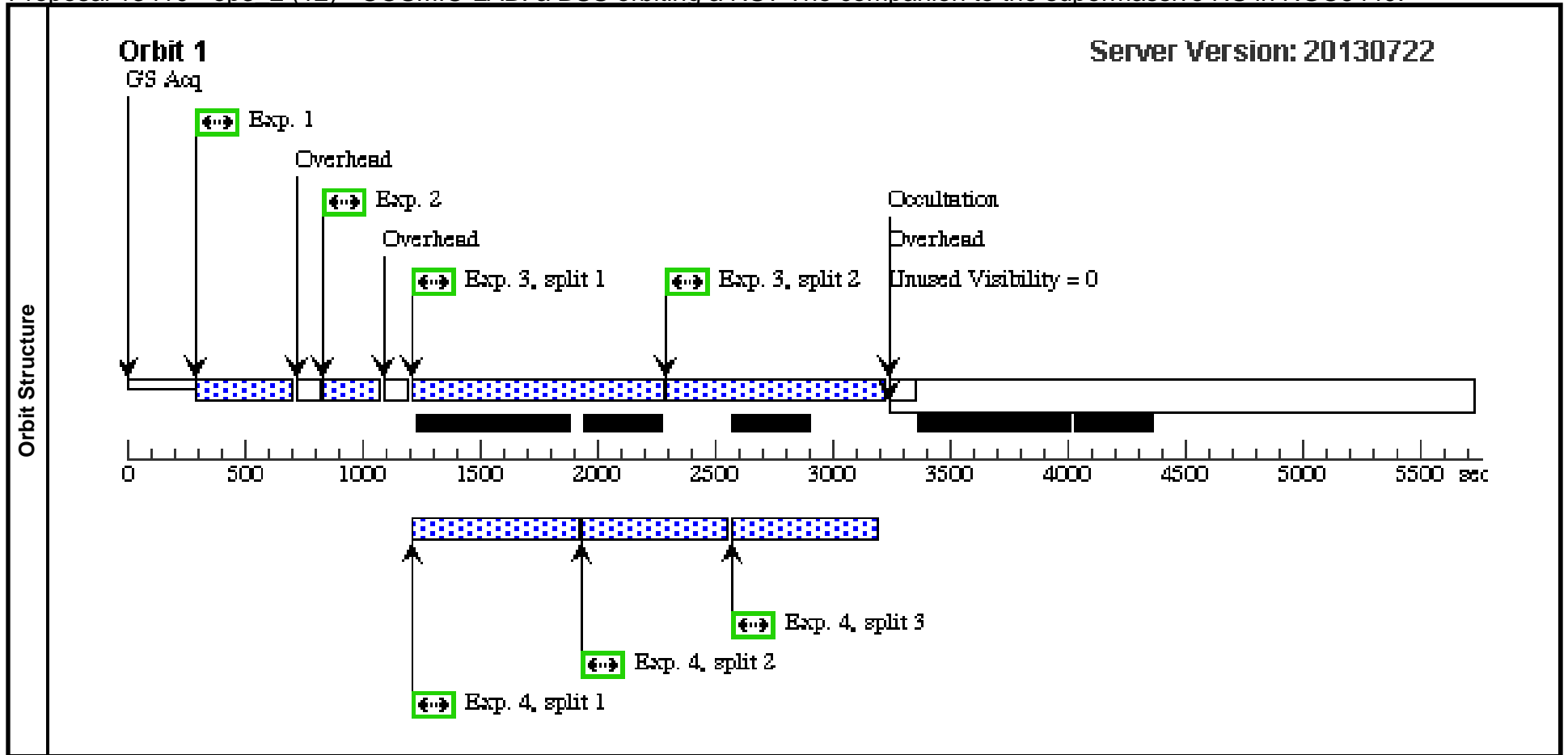
Visit	<p>Proposal 13410, ep3_1 (11), implementation</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS, ACS/WFC</p> <p>Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 10 BY 102.55 D TO 102.95 D</p> <p><i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i></p> <p><i>However for safety we report here the coordinates of the two stars:</i></p> <p><i>Target: R.A.=267.2205266 Dec=-20.3605934 (J2000)</i></p> <p><i>Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)</i></p>																				
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#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																
(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS																
Fixed Targets																					
	Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit										
		1	ep3_V1	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG -0.099,0 .052		382 Secs (382 Secs)											
										[==>]	[1]										
		2	ep3_I1	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		SAME POS AS 1		222 Secs (222 Secs)											
									[==>]	[1]											
3	ep3_Ha1	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N		CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Group 3-4 in ep3_1 (11)	1868 Secs (1868 Secs)												
									[==>(Split 1)]	[1]											
									[==>(Split 2)]												
4	ep3_par1	ANY	ACS/WFC, ACCUM, WFC1	F606W		CR-SPLIT=3		Prime + Parallel Group 3-4 in ep3_1 (11)	1500 Secs (1500 Secs)												
									[==>(Split 1)]												
									[==>(Split 2)]	[1]											
									[==>(Split 3)]												



Proposal 13410 - ep3_2 (12) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:13 GMT 2013

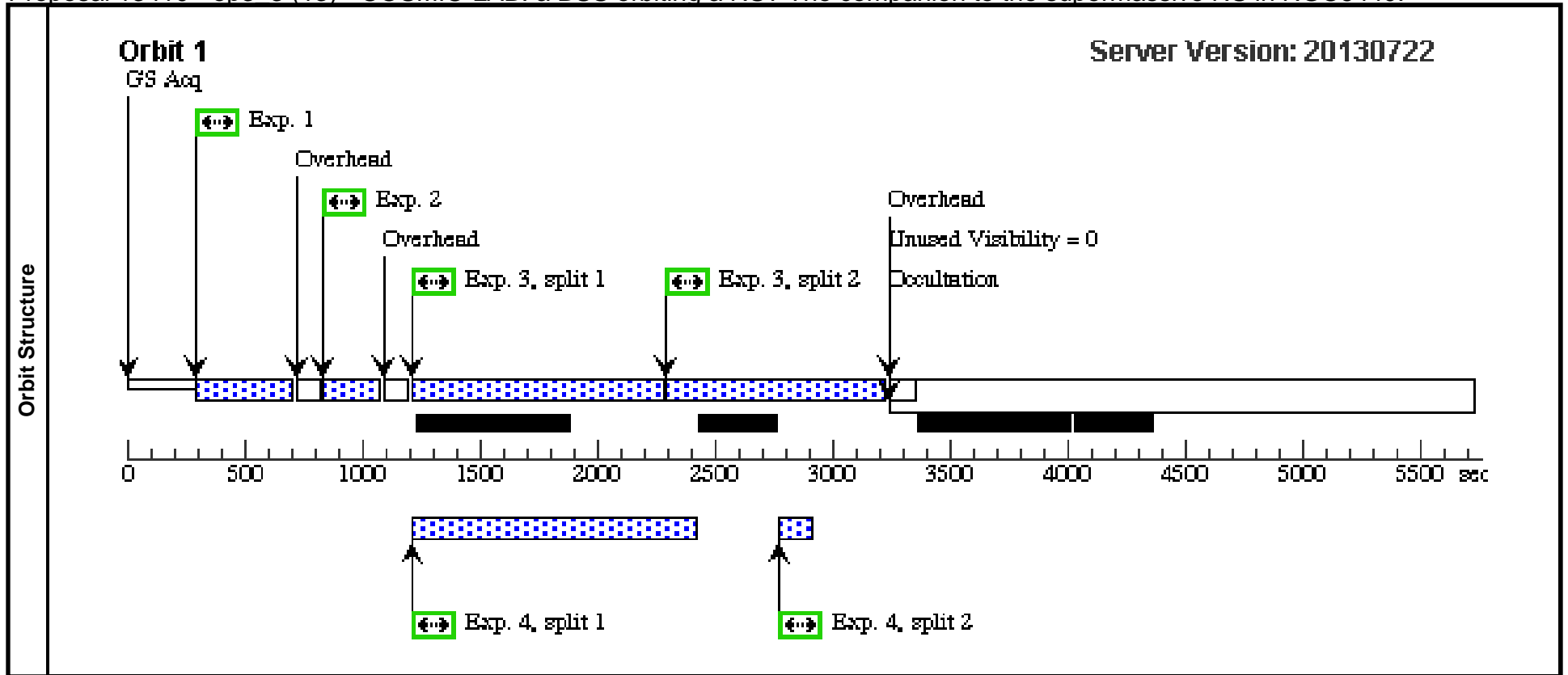
Visit	Proposal 13410, ep3_2 (12), implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 11 BY 1.50 D TO 1.92 D Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook. However for safety we report here the coordinates of the two stars: Target: R.A.=267.2205266 Dec=-20.3605934 (J2000) Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)																				
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#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																
(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS																
Fixed Targets																					
	Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit										
		1	ep3_V2	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG -0.040,0 .214		382 Secs (382 Secs) [==>]	[1]										
		2	ep3_I2	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		SAME POS AS 1		222 Secs (222 Secs) [==>]	[1]										
		3	ep3_Ha2	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N	CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Group 3-4 in ep3_2 (12)	1868 Secs (1868 Secs) [==>(Split 1)] [==>(Split 2)]	[1]										
4		ep3_par3	ANY	ACS/WFC, ACCUM, WFC1	F814W	CR-SPLIT=3		Prime + Parallel Group 3-4 in ep3_2 (12)	1500 Secs (1500 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)]	[1]											



Proposal 13410 - ep3_3 (13) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:14 GMT 2013

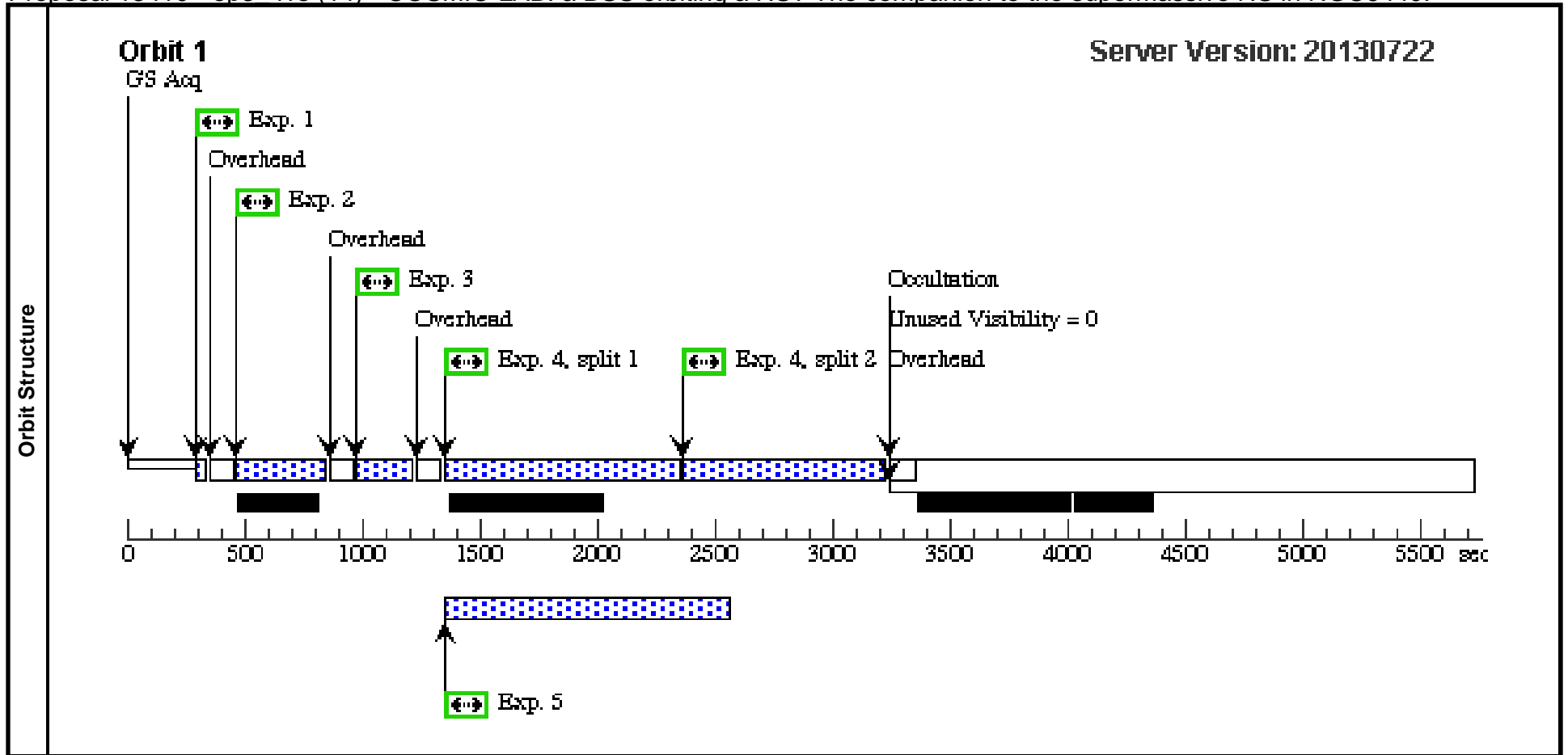
Visit	Proposal 13410, ep3_3 (13), implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 11 BY 3.22 D TO 3.64 D <i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i> <i>However for safety we report here the coordinates of the two stars:</i> Target: R.A.=267.2205266 Dec=-20.3605934 (J2000) Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)																																																											
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	1	ep3_V3	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG 0.059,0.162		382 Secs (382 Secs) [==>]	[1]																																																		
	2	ep3_I3	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		SAME POS AS 1		222 Secs (222 Secs) [==>]	[1]																																																		
	3	ep3_Ha3	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N	CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Group 3-4 in ep3_3 (13)	1868 Secs (1868 Secs) [==>(Split 1)] [==>(Split 2)]	[1]																																																		
4	ep3_par3	ANY	ACS/WFC, ACCUM, WFC1	F606W	CR-SPLIT=2		Prime + Parallel Group 3-4 in ep3_3 (13)	1000 Secs (1010 Secs) [==>1000.0 Secs (Split 1)] [==>10.0 Secs (Split 2)]	[1]																																																			
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Proposal 13410 - ep3_4vs (14) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:14 GMT 2013

Visit	Proposal 13410, ep3_4vs (14), implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 11 BY 4.93 D TO 5.35 D <i>Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook.</i> <i>However for safety we report here the coordinates of the two stars:</i> Target: R.A.=267.2205266 Dec=-20.3605934 (J2000) Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)																				
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#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous																
(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS																
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit											
	1	ep3_Vs	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		POS TARG 0.158,0.110		10 Secs (10 Secs)												
									[==>]	[1]											
	2	ep3_V4	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W			SAME POS AS 1	382 Secs (382 Secs)												
									[==>]	[1]											
	3	ep3_I4	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W			SAME POS AS 1	222 Secs (222 Secs)												
								[==>]	[1]												
4	ep3_Ha4	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N		CR-SPLIT=2; FLASH=12	SAME POS AS 1	Prime + Parallel Group 4-5 in ep3_4vs (14)	1728 Secs (1728 Secs)												
									[==>(Split 1)]	[1]											
									[==>(Split 2)]												
5	ep3_par4	ANY	ACS/WFC, ACCUM, WFC1	F814W				Prime + Parallel Group 4-5 in ep3_4vs (14)	1000 Secs (1000 Secs)												
									[==>]	[1]											



Proposal 13410 - ep3_5is (15) - COSMIC-LAB: a BSS orbiting a NS? The companion to the supermassive NS in NGC6440.

Tue Sep 17 01:09:15 GMT 2013

Visit	Proposal 13410, ep3_5is (15), implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 8D TO 128 D; ORIENT 188D TO 308 D; AFTER 11 BY 6.64 D TO 7.06 D Comments: In order to avoid a possible contamination to the target region by spikes of a close bright star, we calculated the range of allowed orientations by following the instructions in the Section 7.2.2 of the phase 2 Handbook. However for safety we report here the coordinates of the two stars: Target: R.A.=267.2205266 Dec=-20.3605934 (J2000) Bright star: R.A.=267.2204492 Dec=-20.3604035 (J2000)									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	PSR6440B	RA: 17 48 52.9530 (267.2206375d) Dec: -20 21 38.86 (-20.36079d) Equinox: J2000		V=21.5	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ep3_Is	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		POS TARG 0.099,-0.052		6 Secs (6 Secs) [==>]	[1]
	2	ep3_I5	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F814W		SAME POS AS 1		221 Secs (221 Secs) [==>]	[1]
	3	ep3_Ha5	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F656N	CR-SPLIT=2; FLASH=12	SAME POS AS 1		1720 Secs (1720 Secs) [==>(Split 1)] [==>(Split 2)]	[1]
	4	ep3_V5	(1) PSR6440B	WFC3/UVIS, ACCUM, UVIS1	F606W		SAME POS AS 1	Prime + Parallel Group 4-5 in ep3_5is (15)	382 Secs (382 Secs) [==>]	[1]
	5	ep3_par5	ANY	ACS/WFC, ACCUM, WFC1	F814W			Prime + Parallel Group 4-5 in ep3_5is (15)	10 Secs (10 Secs) [==>]	[1]

