



## 16029 - WFC3 UVIS Background Recommendation Check

Cycle: 27, Proposal Category: ENG/WFC3

(Availability Mode: RESTRICTED)

### 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	DARK	WFC3/UVIS	1	04-Nov-2019 16:00:11.0	yes
02	DARK	WFC3/UVIS	1	04-Nov-2019 16:00:12.0	yes
03	DARK	WFC3/UVIS	1	04-Nov-2019 16:00:13.0	yes
04	DARK	WFC3/UVIS	1	04-Nov-2019 16:00:13.0	yes
05	DARK	WFC3/UVIS	1	04-Nov-2019 16:00:14.0	yes
06	DARK	WFC3/UVIS	1	04-Nov-2019 16:00:14.0	yes
07	DARK	WFC3/UVIS	1	04-Nov-2019 16:00:15.0	yes
08	DARK	WFC3/UVIS	1	04-Nov-2019 16:00:15.0	yes
09	DARK	WFC3/UVIS	1	04-Nov-2019 16:00:16.0	yes
10	DARK	WFC3/UVIS	1	04-Nov-2019 16:00:16.0	yes

10 Total Orbits Used

## **ABSTRACT**

Using hot and warm pixels from internal darks, we will reevaluate the optimum background level for mitigating CTE. Recent analysis of an external data set has shown that the current background recommendations could be improved. This is not because the shape of the loss curve has changed, but rather because the level of losses has changed. Previously it was tolerable to lose about 25% of source flux to traps, as those relatively modest losses could be reliably restored by the pixel-based reconstruction procedure. However, this strategy becomes less effective as the CTE losses continue to grow, i.e. it becomes increasingly difficult for the pixel-based CTE correction to reconstruct the image properly.

## **OBSERVING DESCRIPTION**

Short (18s) darks taken at a variety of image background levels (via post-flash) will be used in conjunction with the long (900s) post-flashed darks already being acquired in the monitoring proposals in order to derive a spectrum of the CTE losses. We have confirmed that the factor of ~50 in scaling provides plenty of warm pixels to use in the analysis.

We vary the commanded dark level so that the effective darktime is the same for all exposures (18s). This will allow us to explore the exact same warm pixels in every exposure.

Since we are using LOW current in the flashing (so that we can probe the background at 1-e increments), the highest background we seek (36e) will require 14s of lamp time, with an overhead of 3s when using the lamp, and with a minimum commanded dark time of 1s, so this means 18s is the effective dark time we should shoot for for this exposure, and thus all exposures. The first exposure has 18s with no lamp. The other exposures have commanded darktime = 18s - 3s - lamptime.

We have three exposures per orbit for ten orbits. This will allow us to explore CTE losses at very fine background sampling: 0e, 2e, 4e, 6e, 8e, 10e, 11e, 12e, 13e, 14e, 15e, 16e, 17e, 18e, 19e, 20e, 21e, 22e, 23e, 24e, 25e, 26e, 27e, 28e, 29e, 30e, 31e, 32e, 34e, and 36e.

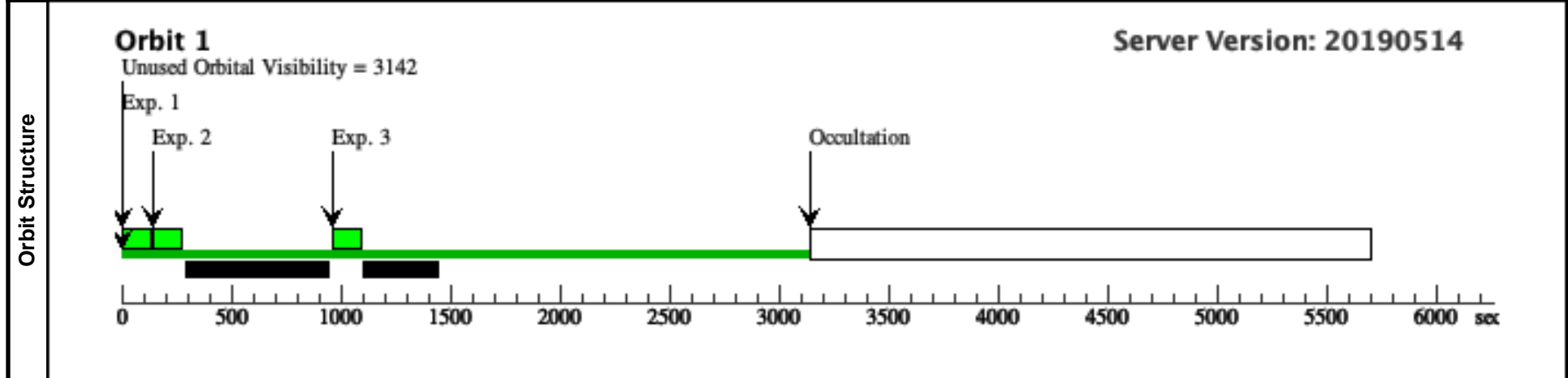
We will take all 10 internal orbits within a period of 10 days, all within the same anneal period (Dec 5- Dec 23). The 10 days will give us 20-30 contemporaneous long darks without anneal interruption for use in the analysis.

Proposal 16029 - 0, 2, 4e (01) - WFC3 UVIS Background Recommendation Check

Mon Nov 04 21:00:16 GMT 2019

<b>Visit</b>	Proposal 16029, 0, 2, 4e (01)									
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 05-DEC-2019 AND 23-DEC-2019: GROUP 01,02,03,04,05,06,07,08,09,10 WITHIN 10D									

<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	0e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF				18.0 Secs (18 Secs)	
									[==>]	[1]
	2	2e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=2			14.2 Secs (14.2 Secs)	
								[==>]	[1]	
3	4e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=4			13.4 Secs (13.4 Secs)		
								[==>]	[1]	

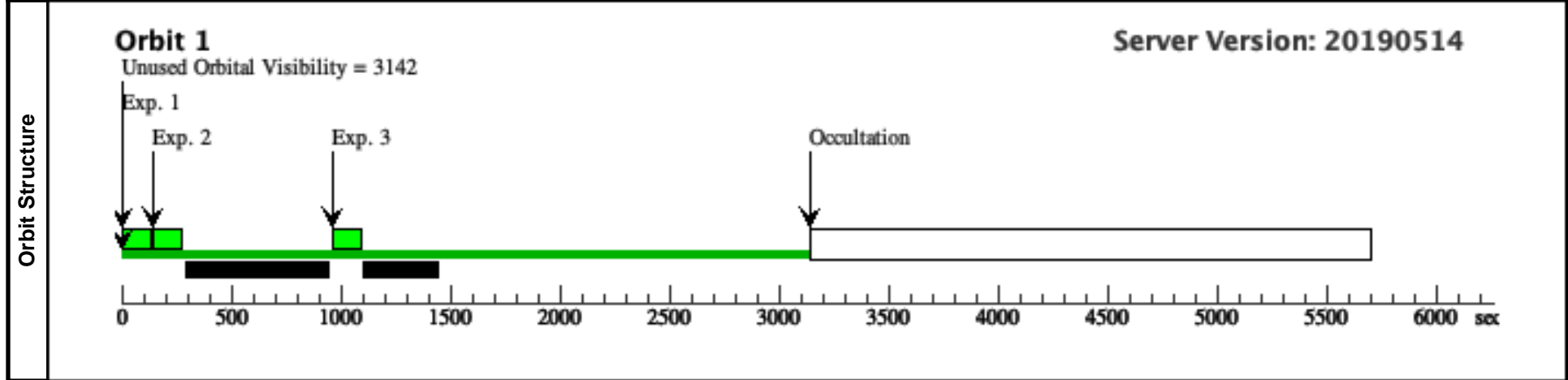


Proposal 16029 - 6, 8, 10e (02) - WFC3 UVIS Background Recommendation Check

Mon Nov 04 21:00:17 GMT 2019

<b>Visit</b>	Proposal 16029, 6, 8, 10e (02)									
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 05-DEC-2019 AND 23-DEC-2019									

<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	6e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=6.0			12.7 Secs (12.7 Secs)	
									[==>]	[1]
	2	8e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=8.0			11.9 Secs (11.9 Secs)	
								[==>]	[1]	
	3	10e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=10.0			11.1 Secs (11.1 Secs)	
								[==>]	[1]	

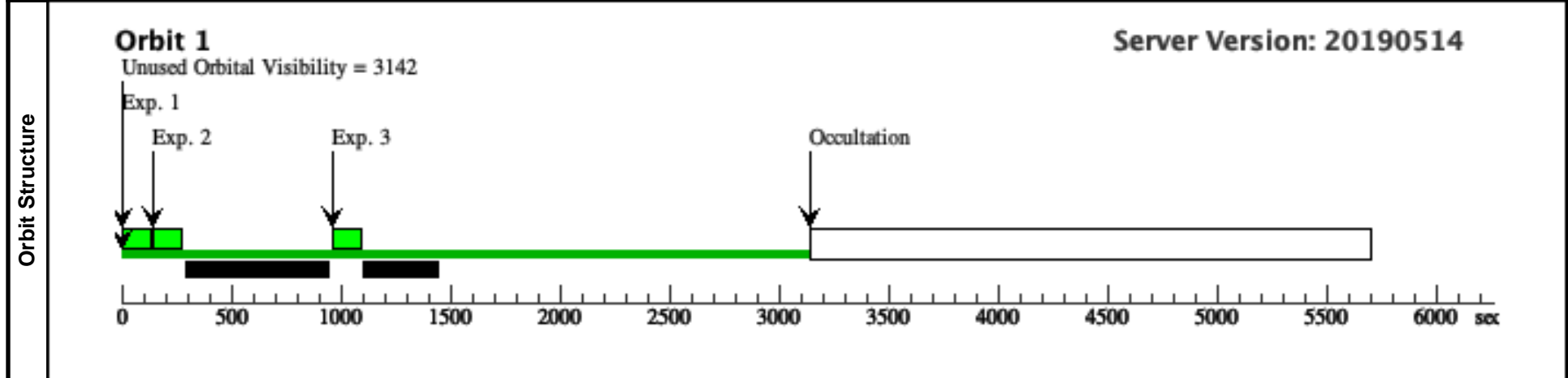


Proposal 16029 - 11, 12, 13e (03) - WFC3 UVIS Background Recommendation Check

Mon Nov 04 21:00:17 GMT 2019

<b>Visit</b>	Proposal 16029, 11, 12, 13e (03)									
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 05-DEC-2019 AND 23-DEC-2019									

<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	11e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=11.0			10.7 Secs (10.7 Secs)	
									[==>]	[1]
	2	12e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=12.0			10.3 Secs (10.3 Secs)	
								[==>]	[1]	
	3	13e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=13.0			9.9 Secs (9.9 Secs)	
								[==>]	[1]	

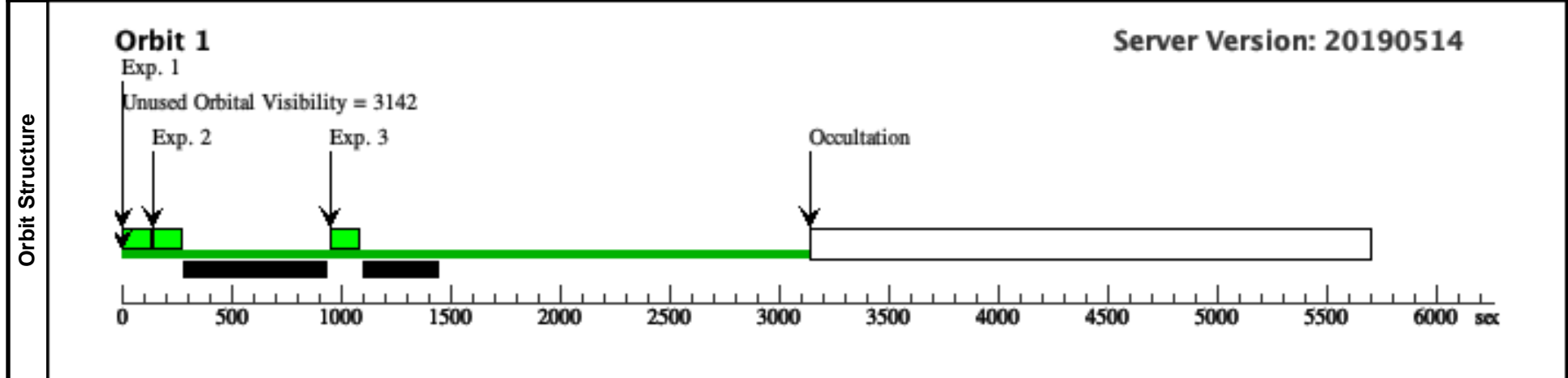


Proposal 16029 - 14, 15, 16e (04) - WFC3 UVIS Background Recommendation Check

Mon Nov 04 21:00:17 GMT 2019

<b>Visit</b>	Proposal 16029, 14, 15, 16e (04)									
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 05-DEC-2019 AND 23-DEC-2019									

<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	14e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=14.0			9.6 Secs (9.6 Secs)	
									[==>]	[1]
	2	15e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=15.0			9.2 Secs (9.2 Secs)	
								[==>]	[1]	
3	16e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=16.0			8.8 Secs (8.8 Secs)		
								[==>]	[1]	

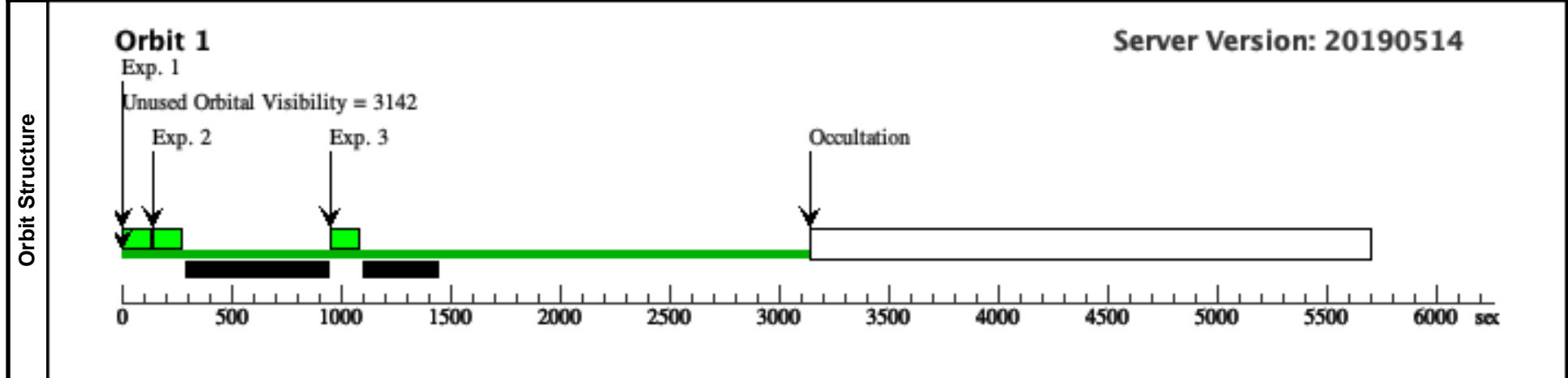


Proposal 16029 - 17, 18, 19e (05) - WFC3 UVIS Background Recommendation Check

Mon Nov 04 21:00:17 GMT 2019

<b>Visit</b>	Proposal 16029, 17, 18, 19e (05)									
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 05-DEC-2019 AND 23-DEC-2019									

<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	17e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=17.0			8.4 Secs (8.4 Secs)	
									[==>]	[1]
	2	18e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=18.0			8.0 Secs (8 Secs)	
								[==>]	[1]	
	3	19e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=19.0			7.7 Secs (7.7 Secs)	
								[==>]	[1]	

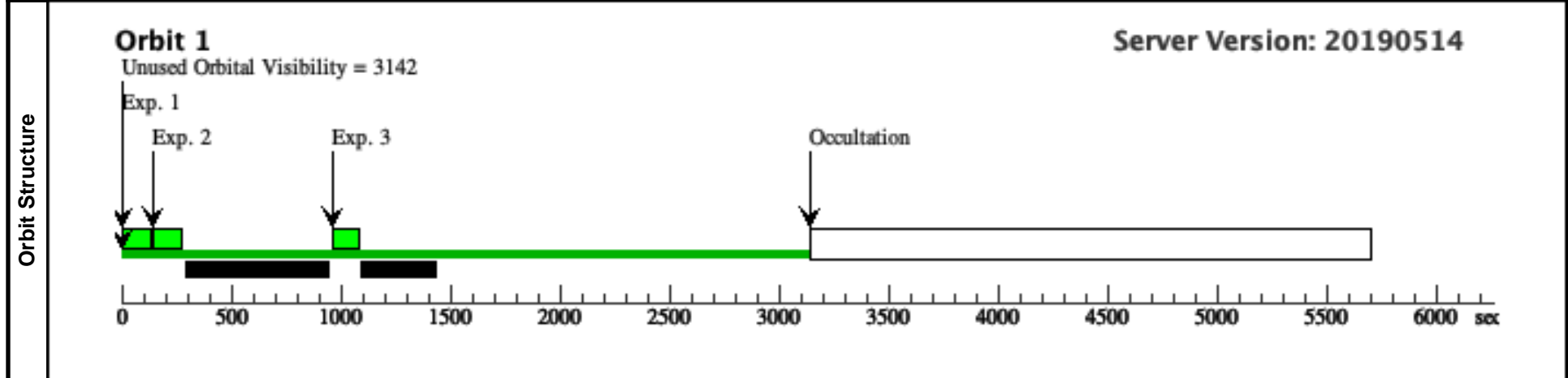


Proposal 16029 - 20, 21, 22e (06) - WFC3 UVIS Background Recommendation Check

Mon Nov 04 21:00:17 GMT 2019

<b>Visit</b>	Proposal 16029, 20, 21, 22e (06)									
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 05-DEC-2019 AND 23-DEC-2019									

<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	20e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=20.0			7.3 Secs (7.3 Secs)	
									[==>]	[1]
	2	21e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=21.0			6.9 Secs (6.9 Secs)	
								[==>]	[1]	
	3	22e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=22.0			6.5 Secs (6.5 Secs)	
								[==>]	[1]	



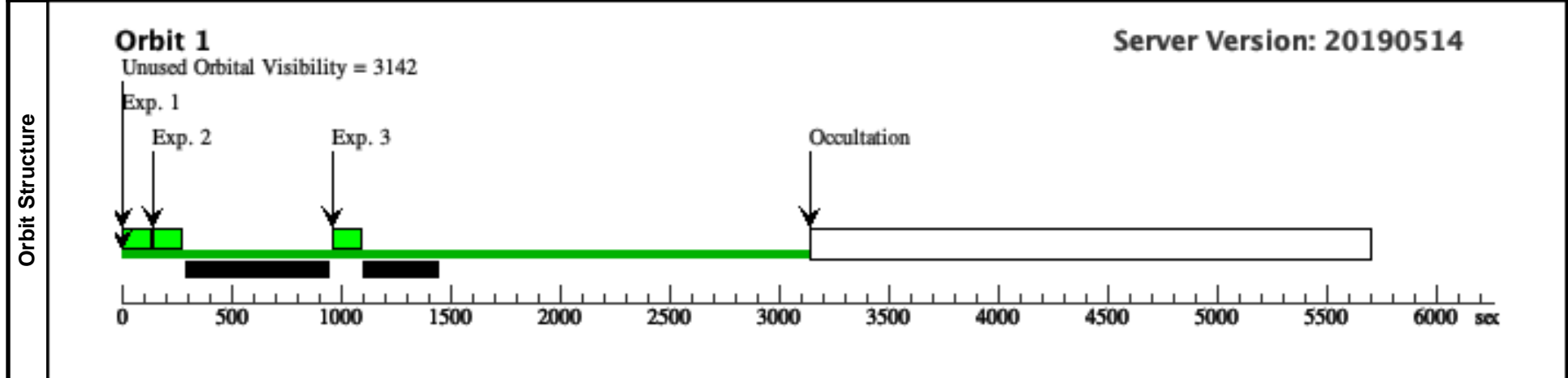


Proposal 16029 - 23, 24, 25e (07) - WFC3 UVIS Background Recommendation Check

Mon Nov 04 21:00:17 GMT 2019

<b>Visit</b>	Proposal 16029, 23, 24, 25e (07)									
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 05-DEC-2019 AND 23-DEC-2019									

<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	23e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=23.0			6.1 Secs (6.1 Secs)	
									[==>]	[1]
	2	24e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=24.0			5.7 Secs (5.7 Secs)	
								[==>]	[1]	
3	25e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASH=25.0			5.3 Secs (5.3 Secs)		
								[==>]	[1]	

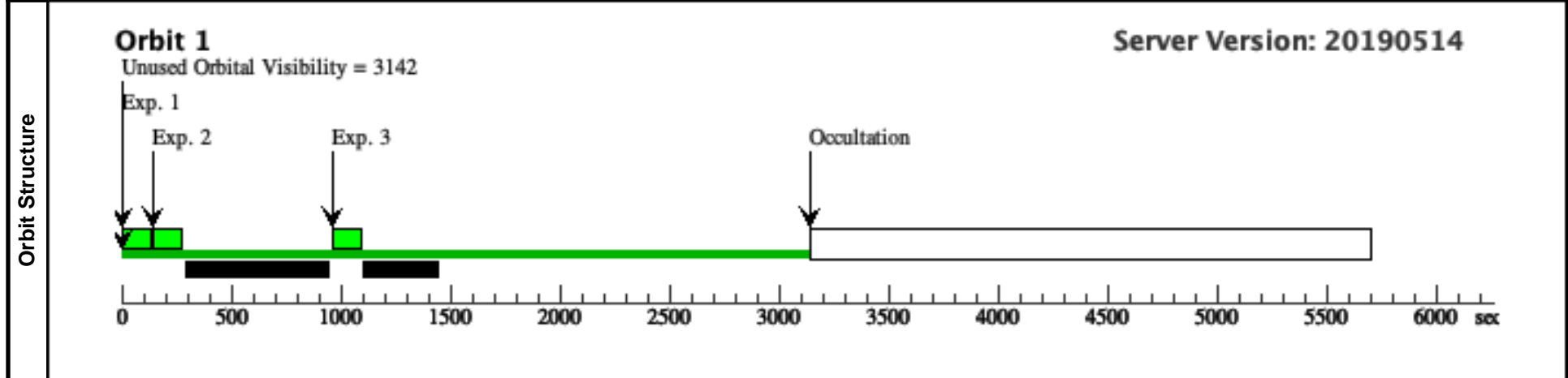


Proposal 16029 - 26, 27, 28e (08) - WFC3 UVIS Background Recommendation Check

Mon Nov 04 21:00:17 GMT 2019

<b>Visit</b>	Proposal 16029, 26, 27, 28e (08)									
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 05-DEC-2019 AND 23-DEC-2019									

<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	26e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=10.1			4.9 Secs (4.9 Secs)	
									[==>]	[1]
	2	27e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=10.5			4.5 Secs (4.5 Secs)	
								[==>]	[1]	
3	28e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=10.9			4.1 Secs (4.1 Secs)		
								[==>]	[1]	

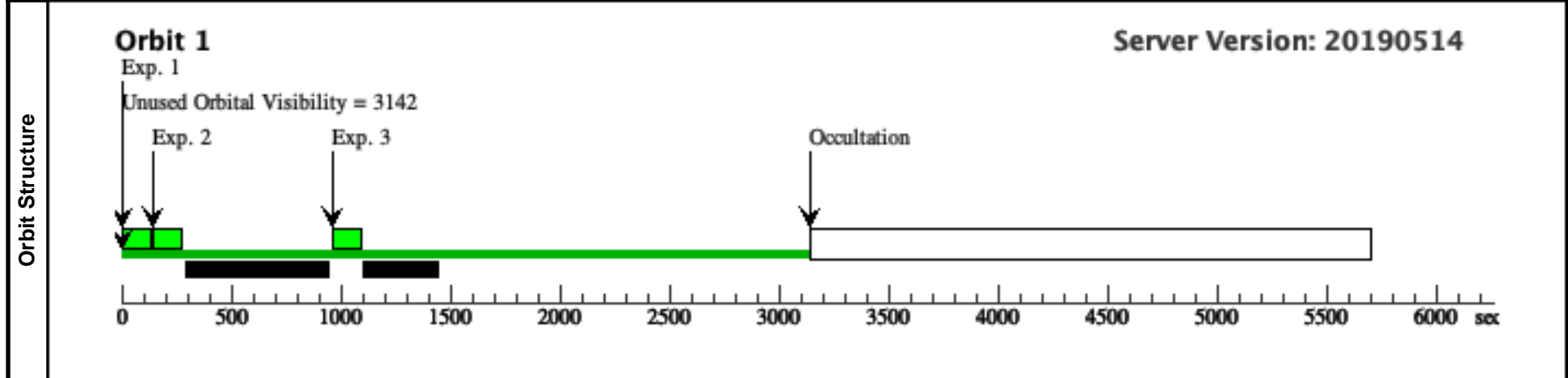


Proposal 16029 - 29, 30, 31e (09) - WFC3 UVIS Background Recommendation Check

Mon Nov 04 21:00:17 GMT 2019

<b>Visit</b>	Proposal 16029, 29, 30, 31e (09)									
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 05-DEC-2019 AND 23-DEC-2019									

<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	29e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW;			3.8 Secs (3.8 Secs)	
						FLASHEXP=11.2			[==>]	[1]
	2	30e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW;			3.4 Secs (3.4 Secs)	
					FLASHEXP=11.6			[==>]	[1]	
3	31e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW;			3.0 Secs (3 Secs)		
					FLASHEXP=12.0			[==>]	[1]	



Proposal 16029 - 32, 34, 36e (10) - WFC3 UVIS Background Recommendation Check

Mon Nov 04 21:00:17 GMT 2019

<b>Visit</b>	Proposal 16029, 32, 34, 36e (10)									
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: WFC3/UVIS									
	Special Requirements: BETWEEN 05-DEC-2019 AND 23-DEC-2019									

<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	32e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=12.4			2.6 Secs (2.6 Secs)	
									[==>]	[1]
	2	34e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=13.2			1.8 Secs (1.8 Secs)	
								[==>]	[1]	
3	36e	DARK	WFC3/UVIS, ACCUM, UVIS-FIX	DEF	FLASHCUR=LOW; FLASHEXP=14.0			1.0 Secs (1 Secs)		
								[==>]	[1]	

