



17353 - WFC3 UVIS CTI Monitor (EPER)

Cycle: 31, Proposal Category: CAL/WFC3

(Availability Mode: RESTRICTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
Mr. Harish Khandrika (PI) (Contact)	Space Telescope Science Institute
Anne O'Connor (CoI)	Space Telescope Science Institute

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 TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:15.0	yes
02	DARK TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:15.0	yes
03	DARK TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:16.0	yes
04	DARK TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:16.0	yes
05	DARK TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:17.0	yes
06	DARK TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:17.0	yes
07	DARK TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:17.0	yes
08	DARK TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:18.0	yes

<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>
09	DARK TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:18.0	yes
10	DARK TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:19.0	yes
11	DARK TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:19.0	yes
12	DARK TUNGSTEN	WFC3/UVIS	1	19-Jul-2023 16:00:20.0	yes

12 Total Orbits Used

ABSTRACT

This proposal measures CTI (Charge Transfer Inefficiency) for WFC3/UVIS, making use of the EPER mode, Extended Pixel Edge Response. EPER is not unique to WFC3 (also used on ACS) and measures trailing charge in detector overscan regions increased by extended pixels. The EPER program has many cycles worth of similar comparison, including proposals 11924, 12347, 12691, 13082, 12565, 14011, 14377, 14540, 14989, 15575, 15720, 16400, 17008

OBSERVING DESCRIPTION

In this 12 orbit program we take pairs of internal flat fields at varying levels of illumination. We take "biases" for this proposals as 1/2 second darks; WFC3/UVIS flight software is unable to take 0 second exposures in the non-standard EPER mode. Every visit pair includes two half-second darks, three F390M internal tungsten flats, and two F438W internal flats. The proposal lasts a full year, made up of 8 week visit pair increments .

The analysis is done with a pipeline to remove noise, calibrate images, and look for trends in CTI data, based on the work of Robberto (ISR 2007-13), automated by Bourque & Kozhurina-Platais (TIR 2012-03), and furthered by Khandrika (ISR 2020-06).

----- Additional Comments -----

Formerly, EPER programs took monthly instead of bi-monthly data.

Proposal 17353 - Visit 01 - WFC3 UVIS CTI Monitor (EPER)

Wed Jul 19 20:00:20 GMT 2023

Visit	Proposal 17353, Visit 01 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 02-NOV-2023:00:00:00 AND 01-DEC-2023:00:00:00; GROUP 01,02 WITHIN 1D									
	(9.2 (01.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser (22.9 (01.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	0.5	DARK	WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER			0.5 Secs (0.5 Secs)	
									[=>]	[1]
	2	9.2	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			9.2 Secs (9.2 Secs)	
								[=>]	[1]	
	3	22.9	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			22.9 Secs (22.9 Secs)	
								[=>]	[1]	
Orbit Structure	<p>Orbit 1 Server Version: 20220630</p> <p>Unused Orbital Visibility = 3142</p> <p>The diagram shows a horizontal timeline from 0 to 6000 seconds. A green bar represents the orbital visibility, which is mostly obscured by a black bar representing occultation starting at approximately 3142 seconds. Three exposures are shown as small green rectangles: Exp. 1 (0-0.5s), Exp. 2 (9.2-9.2s), and Exp. 3 (22.9-22.9s). Reconfiguration events are indicated by vertical arrows between exposures. The occultation bar is a long black rectangle from approximately 3142s to 5700s.</p>									
	<p>Timeline labels: Exp. 1, Reconfig, Exp. 2, Reconfig, Exp. 3, Reconfig, Occultation</p> <p>X-axis: 0, 500, 1000, 1500, 2000, 2500, 3000, 3500, 4000, 4500, 5000, 5500, 6000 sec</p>									

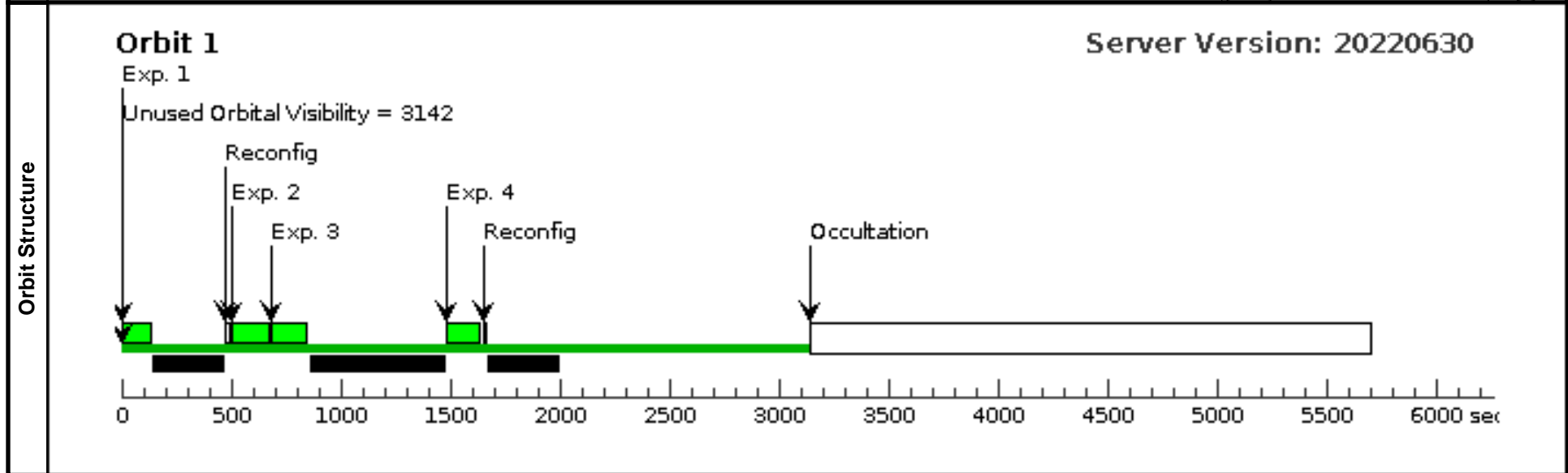
Proposal 17353 - Visit 02 - WFC3 UVIS CTI Monitor (EPER)

Wed Jul 19 20:00:20 GMT 2023

Visit	Proposal 17353, Visit 02	
	Diagnostic Status: Warning	
	Scientific Instruments: WFC3/UVIS	
	Special Requirements: (none)	

Diagnostics	(Visit 02) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU	
	(6.4 (02.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser	
	(7.6 (02.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser	
	(22.7 (02.004)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser	

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	0.5	DARK	WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER			0.5 Secs (0.5 Secs)	
									[==>]	[1]
	2	6.4	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390W	CTE=EPER			6.4 Secs (6.4 Secs)	
								[==>]	[1]	
3	7.6	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER			7.6 Secs (7.6 Secs)		
								[==>]	[1]	
4	22.7	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER			22.7 Secs (22.7 Secs)		
								[==>]	[1]	



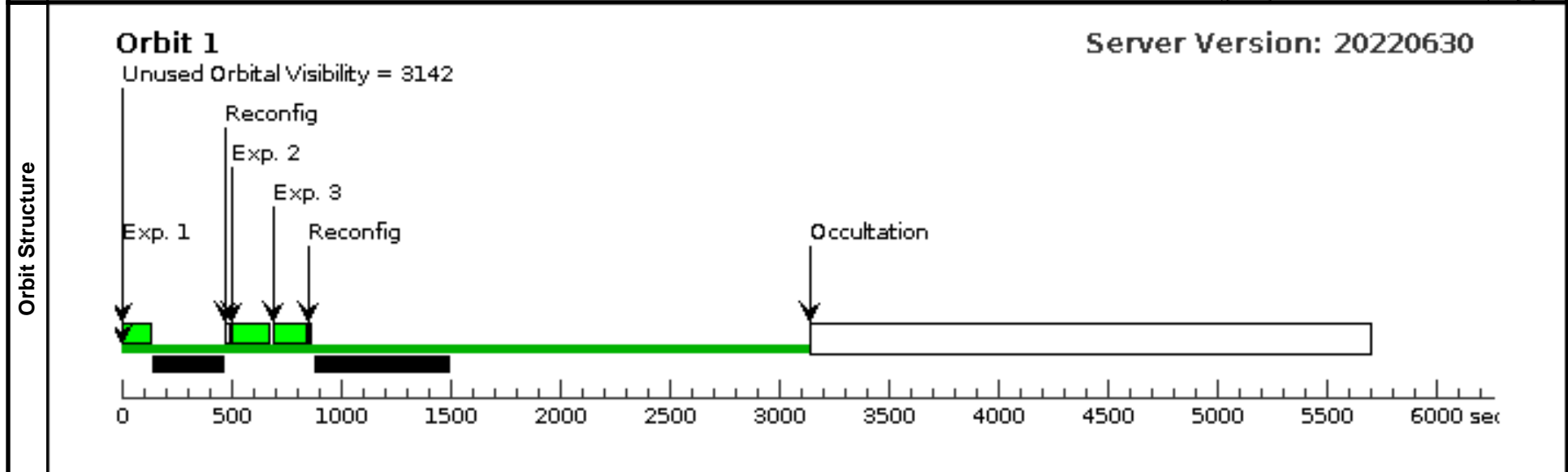
Proposal 17353 - Visit 03 - WFC3 UVIS CTI Monitor (EPER)

Wed Jul 19 20:00:20 GMT 2023

Visit	Proposal 17353, Visit 03 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 01-JAN-2024:00:00:00 AND 01-FEB-2024:00:00:00: GROUP 03,04 WITHIN 1D
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Diagnostics	(9.2 (03.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser (22.9 (03.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	0.5	DARK	WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER			0.5 Secs (0.5 Secs)	
								[=>]	[1]
2	9.2	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			9.2 Secs (9.2 Secs)	
								[=>]	[1]
3	22.9	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			22.9 Secs (22.9 Secs)	
								[=>]	[1]



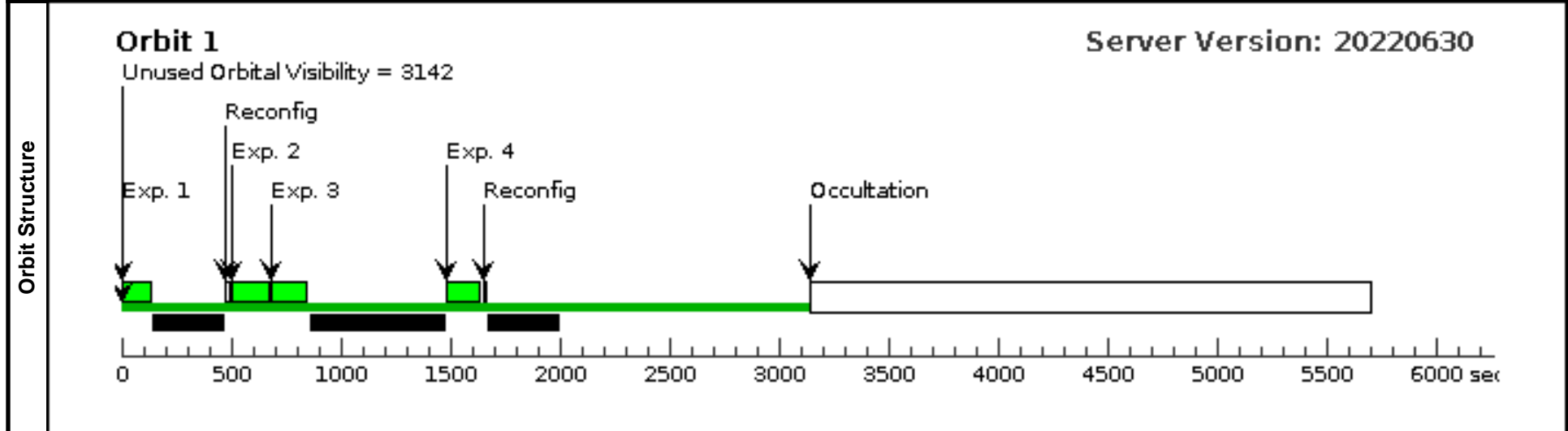
Proposal 17353 - Visit 04 - WFC3 UVIS CTI Monitor (EPER)

Wed Jul 19 20:00:20 GMT 2023

Visit	<p>Proposal 17353, Visit 04</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: WFC3/UVIS</p> <p>Special Requirements: (none)</p>
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Diagnostics	<p>(Visit 04) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU</p> <p>(6.4 (04.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser</p> <p>(7.6 (04.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser</p> <p>(22.7 (04.004)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser</p>
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Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	0.5	DARK	WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER				0.5 Secs (0.5 Secs)
									[==>]	[1]
2	6.4	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390W	CTE=EPER				6.4 Secs (6.4 Secs)	
									[==>]	[1]
3	7.6	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER				7.6 Secs (7.6 Secs)	
									[==>]	[1]
4	22.7	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER				22.7 Secs (22.7 Secs)	
									[==>]	[1]



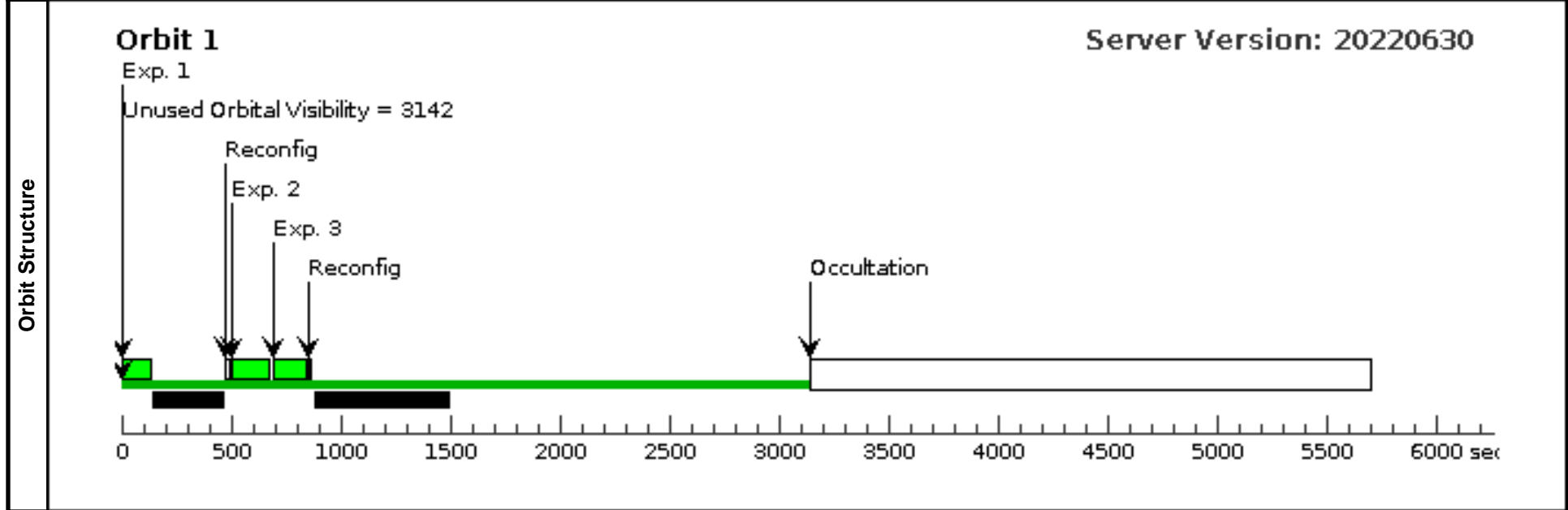
Proposal 17353 - Visit 05 - WFC3 UVIS CTI Monitor (EPER)

Wed Jul 19 20:00:20 GMT 2023

Visit	Proposal 17353, Visit 05 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 01-MAR-2024:00:00:00 AND 01-APR-2024:00:00:00; GROUP 05.06 WITHIN 1D
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Diagnostics	(9.2 (05.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser (22.9 (05.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	0.5	DARK	WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER			0.5 Secs (0.5 Secs) [==>]	[1]
2	9.2	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			9.2 Secs (9.2 Secs) [==>]	[1]
3	22.9	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			22.9 Secs (22.9 Secs) [==>]	[1]



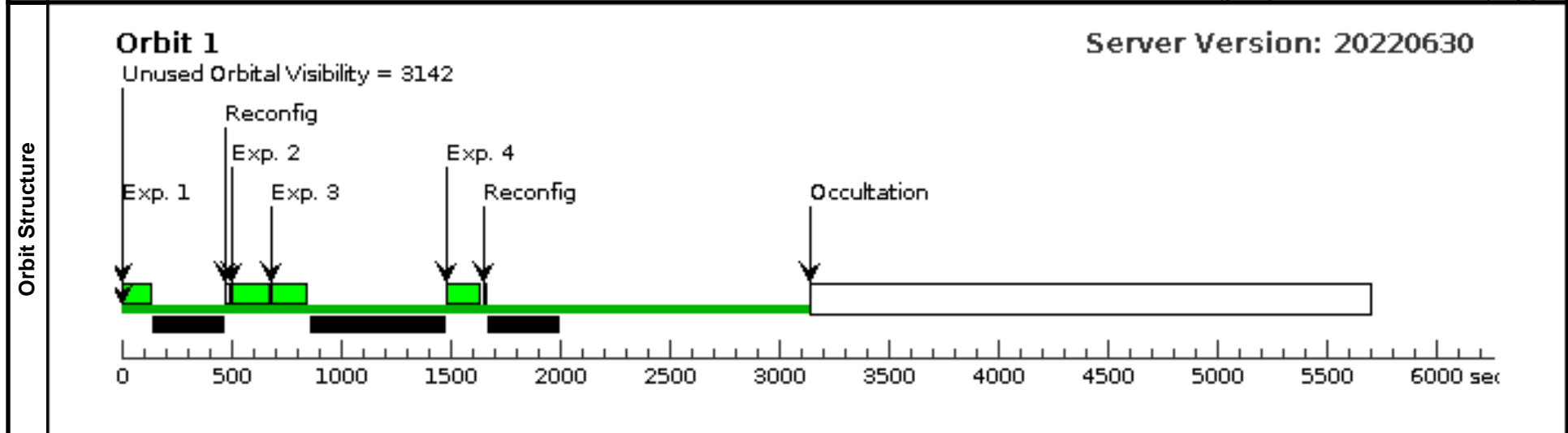
Proposal 17353 - Visit 06 - WFC3 UVIS CTI Monitor (EPER)

Wed Jul 19 20:00:20 GMT 2023

Visit	<p>Proposal 17353, Visit 06</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: WFC3/UVIS</p> <p>Special Requirements: (none)</p>
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Diagnostics	<p>(Visit 06) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU</p> <p>(6.4 (06.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser</p> <p>(7.6 (06.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser</p> <p>(22.7 (06.004)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser</p>
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Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	0.5	DARK		WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER			0.5 Secs (0.5 Secs)
									[==>]	[1]
2	6.4	TUNGSTEN		WFC3/UVIS, ACCUM, UVIS	F390W	CTE=EPER			6.4 Secs (6.4 Secs)	
									[==>]	[1]
3	7.6	TUNGSTEN		WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER			7.6 Secs (7.6 Secs)	
									[==>]	[1]
4	22.7	TUNGSTEN		WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER			22.7 Secs (22.7 Secs)	
									[==>]	[1]



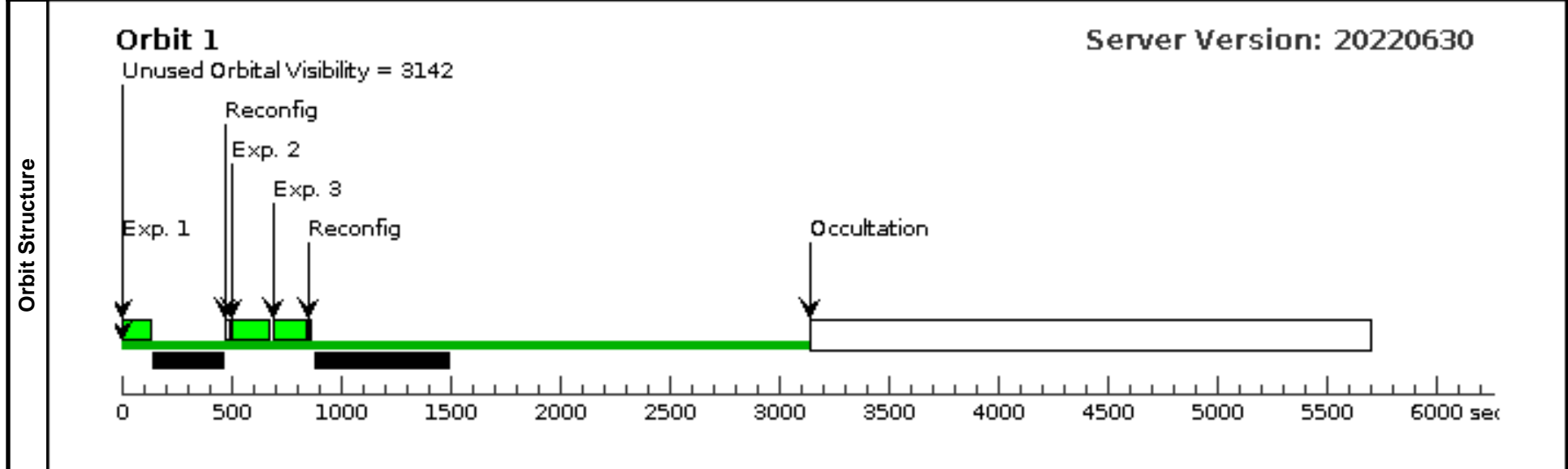
Proposal 17353 - Visit 07 - WFC3 UVIS CTI Monitor (EPER)

Wed Jul 19 20:00:20 GMT 2023

Visit	Proposal 17353, Visit 07 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 01-MAY-2024:00:00:00 AND 01-JUN-2024:00:00:00; GROUP 07.08 WITHIN 1D
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Diagnostics	(9.2 (07.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser (22.9 (07.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	0.5	DARK	WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER			0.5 Secs (0.5 Secs)	
								[=>]	[1]
2	9.2	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			9.2 Secs (9.2 Secs)	
								[=>]	[1]
3	22.9	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			22.9 Secs (22.9 Secs)	
								[=>]	[1]



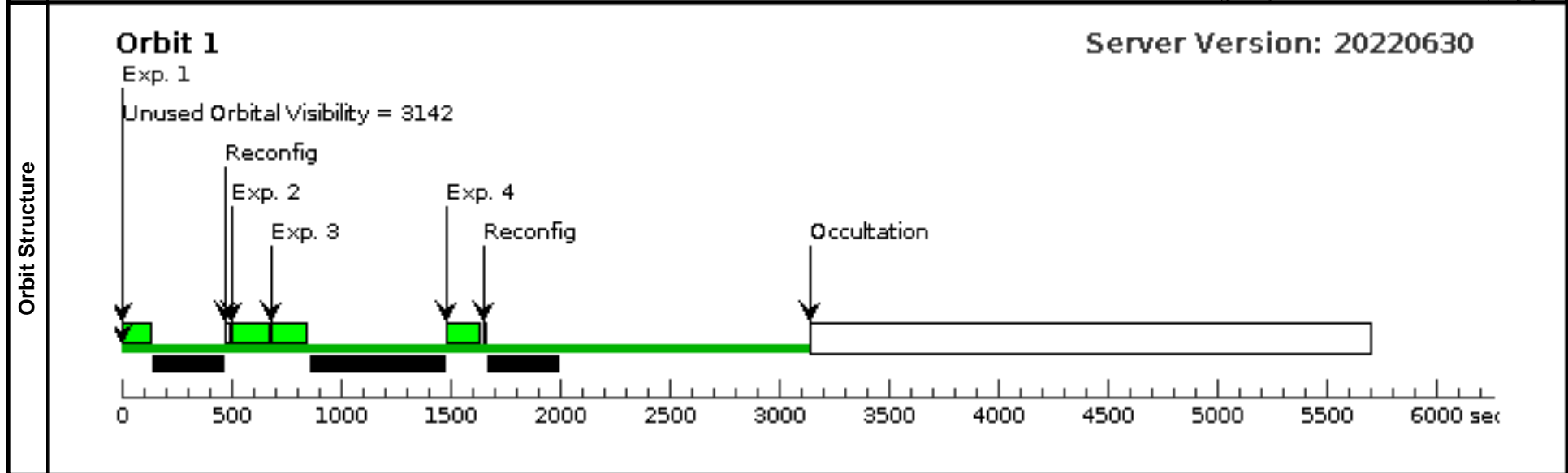
Proposal 17353 - Visit 08 - WFC3 UVIS CTI Monitor (EPER)

Wed Jul 19 20:00:20 GMT 2023

Visit	Proposal 17353, Visit 08 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: (none)
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Diagnostics	(Visit 08) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU (6.4 (08.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser (7.6 (08.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser (22.7 (08.004)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
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Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	0.5	DARK	WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER			0.5 Secs (0.5 Secs)	[1]
2	6.4	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390W	CTE=EPER			6.4 Secs (6.4 Secs)	[1]	
3	7.6	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER			7.6 Secs (7.6 Secs)	[1]	
4	22.7	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER			22.7 Secs (22.7 Secs)	[1]	



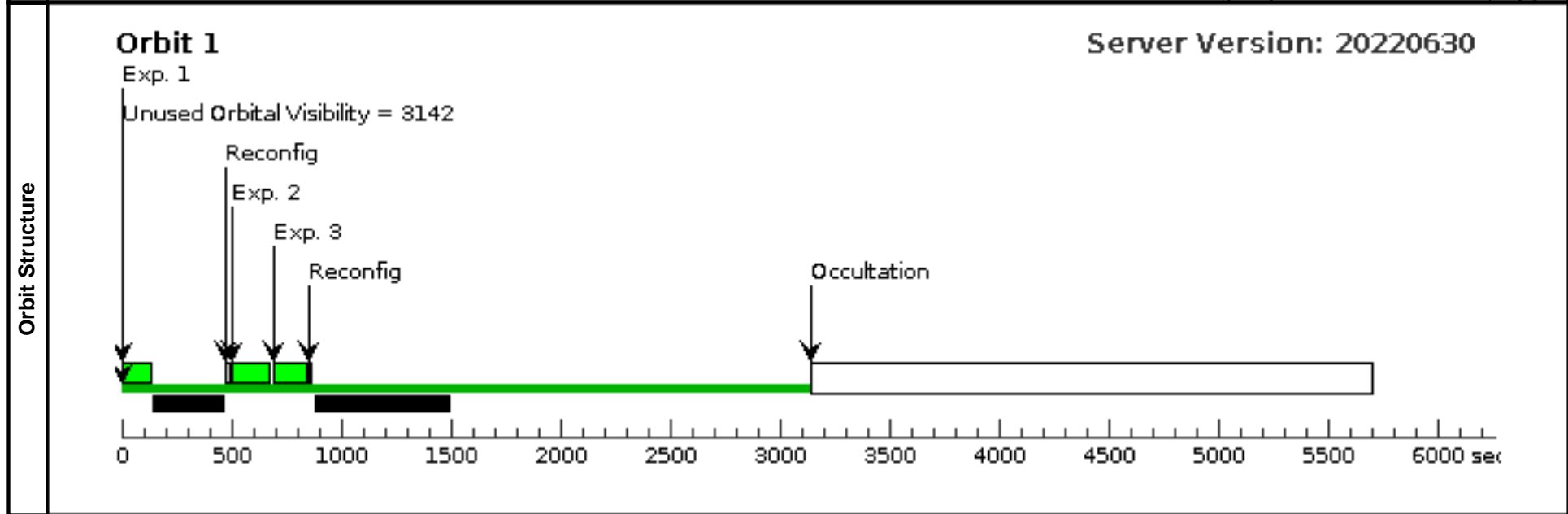
Proposal 17353 - Visit 09 - WFC3 UVIS CTI Monitor (EPER)

Wed Jul 19 20:00:20 GMT 2023

Visit	Proposal 17353, Visit 09 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 01-JUL-2024:00:00:00 AND 01-AUG-2024:00:00:00; GROUP 09.10 WITHIN 1D
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Diagnostics	(9.2 (09.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser (22.9 (09.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	0.5	DARK	WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER			0.5 Secs (0.5 Secs) [==>]	[1]
2	9.2	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			9.2 Secs (9.2 Secs) [==>]	[1]
3	22.9	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			22.9 Secs (22.9 Secs) [==>]	[1]



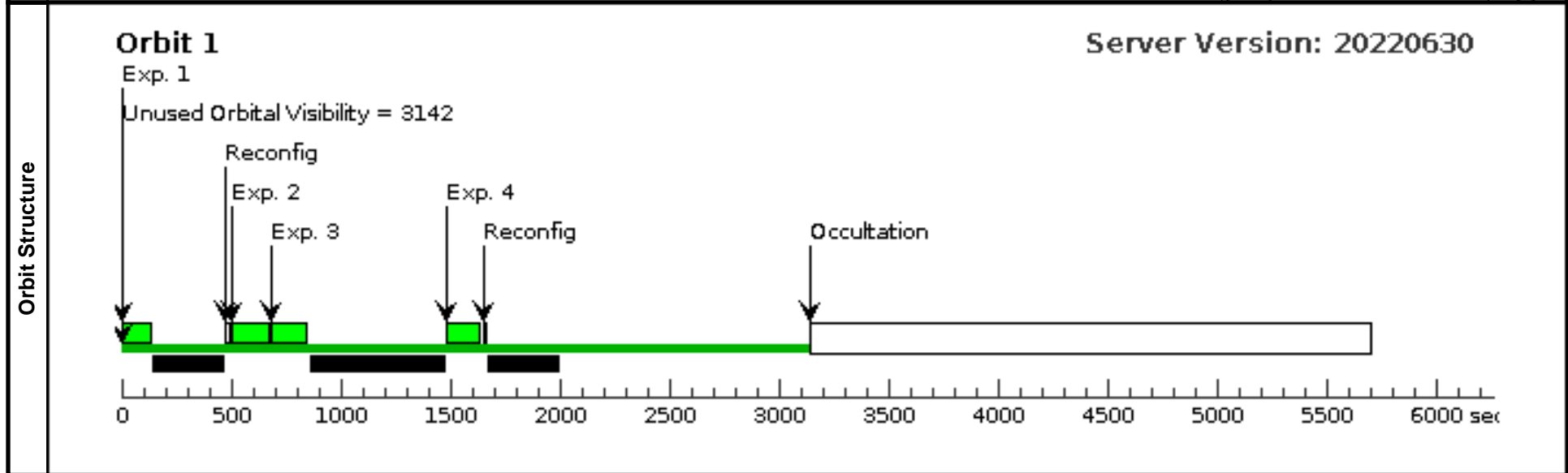
Proposal 17353 - Visit 10 - WFC3 UVIS CTI Monitor (EPER)

Wed Jul 19 20:00:20 GMT 2023

Visit	<p>Proposal 17353, Visit 10</p> <p>Diagnostic Status: Warning</p> <p>Scientific Instruments: WFC3/UVIS</p> <p>Special Requirements: (none)</p>
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Diagnostics	<p>(Visit 10) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU</p> <p>(6.4 (10.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser</p> <p>(7.6 (10.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser</p> <p>(22.7 (10.004)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser</p>
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Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	0.5	DARK		WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER			0.5 Secs (0.5 Secs)
									[==>]	[1]
2	6.4	TUNGSTEN		WFC3/UVIS, ACCUM, UVIS	F390W	CTE=EPER			6.4 Secs (6.4 Secs)	
									[==>]	[1]
3	7.6	TUNGSTEN		WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER			7.6 Secs (7.6 Secs)	
									[==>]	[1]
4	22.7	TUNGSTEN		WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER			22.7 Secs (22.7 Secs)	
									[==>]	[1]



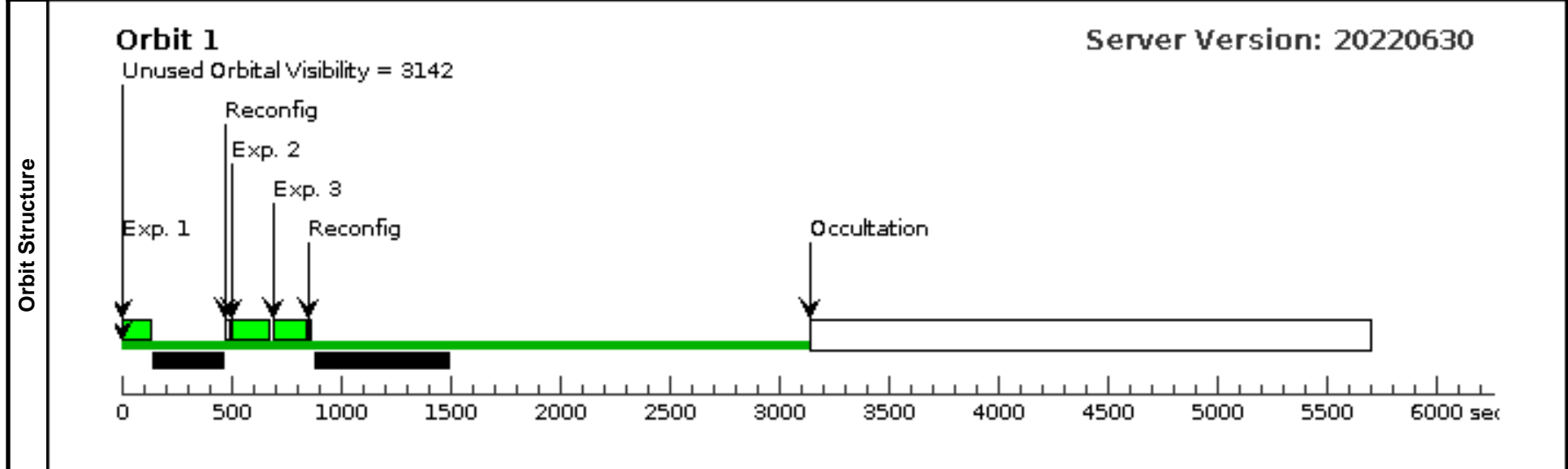
Proposal 17353 - Visit 11 - WFC3 UVIS CTI Monitor (EPER)

Wed Jul 19 20:00:20 GMT 2023

Visit	Proposal 17353, Visit 11 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: BETWEEN 01-SEP-2024:00:00:00 AND 01-OCT-2024:00:00:00: GROUP 11,12 WITHIN 1D
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Diagnostics	(9.2 (11.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser (22.9 (11.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	0.5	DARK	WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER			0.5 Secs (0.5 Secs)	
								[=>]	[1]
2	9.2	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			9.2 Secs (9.2 Secs)	
								[=>]	[1]
3	22.9	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390M	CTE=EPER			22.9 Secs (22.9 Secs)	
								[=>]	[1]



Visit	Proposal 17353, Visit 12 Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: (none)
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Diagnostics	(Visit 12) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU (6.4 (12.002)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser (7.6 (12.003)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser (22.7 (12.004)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
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Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	0.5	DARK	WFC3/UVIS, ACCUM, UVIS	DEF	CTE=EPER				0.5 Secs (0.5 Secs) [==>]
2	6.4	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F390W	CTE=EPER				6.4 Secs (6.4 Secs) [==>]	[1]
3	7.6	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER				7.6 Secs (7.6 Secs) [==>]	[1]
4	22.7	TUNGSTEN	WFC3/UVIS, ACCUM, UVIS	F438W	CTE=EPER				22.7 Secs (22.7 Secs) [==>]	[1]

