



## 17358 - WFC3 IR Linearity Monitor

Cycle: 31, Proposal Category: CAL/WFC3

(Availability Mode: RESTRICTED)

### INVESTIGATORS

<i>Name</i>	<i>Institution</i>
<b>Dr. Joel David Green (PI) (Contact)</b>	<b>Space Telescope Science Institute</b>
Varun Bajaj (CoI) (Contact)	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/IR	1	06-Jul-2023 17:00:15.0	yes
02	DARK TUNGSTEN	WFC3/IR	1	06-Jul-2023 17:00:15.0	yes
03	DARK TUNGSTEN	WFC3/IR	1	06-Jul-2023 17:00:16.0	yes
04	DARK TUNGSTEN	WFC3/IR	1	06-Jul-2023 17:00:16.0	yes
05	DARK TUNGSTEN	WFC3/IR	1	06-Jul-2023 17:00:17.0	yes
06	DARK TUNGSTEN	WFC3/IR	1	06-Jul-2023 17:00:17.0	yes
07	DARK TUNGSTEN	WFC3/IR	1	06-Jul-2023 17:00:18.0	yes
08	DARK TUNGSTEN	WFC3/IR	1	06-Jul-2023 17:00:18.0	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/IR	1	06-Jul-2023 17:00:19.0	yes
10	DARK TUNGSTEN	WFC3/IR	1	06-Jul-2023 17:00:19.0	yes

10 Total Orbits Used

### **ABSTRACT**

The WFC3/IR detector exhibits a non-linear response to incident flux. The data reduction pipeline provides a correction for the non-linearity, which depends on accurate characterization of the response of the detector. To monitor the non-linearity of the WFC3/IR detector, we use a dark observation followed by two internal flats using the Tungsten lamp at different sampling rates, and a trailing dark. Any changes measured in the non-linearity will be updated in the calibration reference file, crucial to providing a correction for accurate photometry. This program is a continuation of the cycle 30 (program 17012) linearity calibration program

### **OBSERVING DESCRIPTION**

To monitor the non-linearity of the WFC3/IR detector, we use a dark observation followed by two internal flats using the Tungsten lamp. We begin with a narrow band flat to ensure that the lamp is warm and stable, but not so bright as to cause persistence, observing the Tungsten lamp with F126N (half SPARS10 and half SPARS50). Then we take internal flats through the F127M filter at different signal levels and sampling sequence (half SPARS10 and half SPARS25). After the F127M flat, a dark is obtained to measure the persistence decay rate.

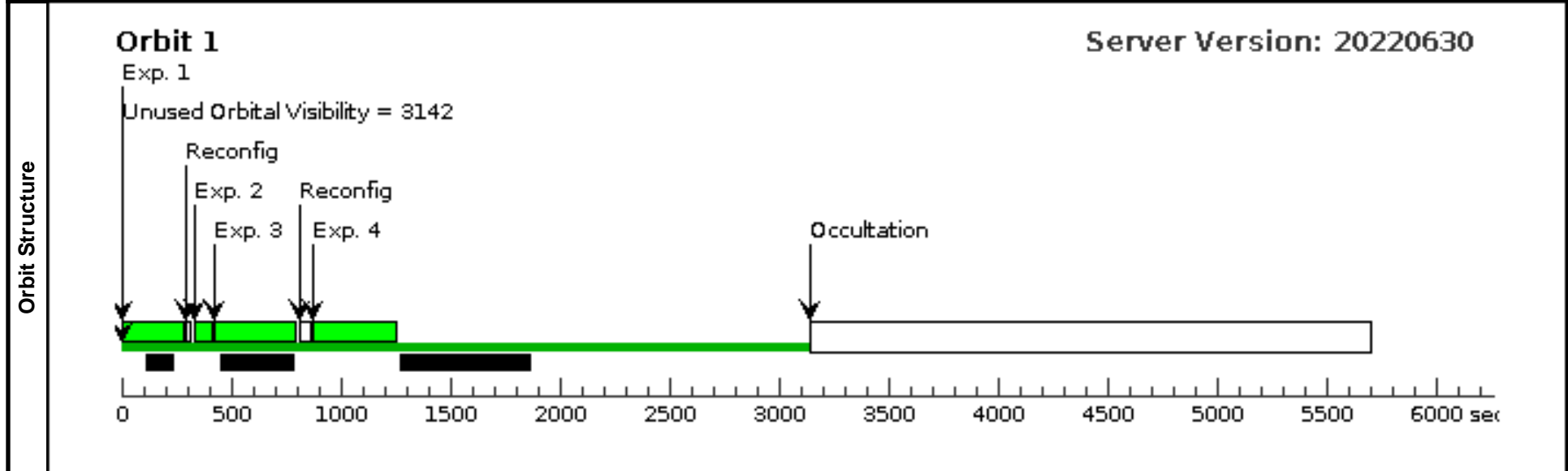
Proposal 17358 - SPARS25a (01) - WFC3 IR Linearity Monitor

Thu Jul 06 21:00:20 GMT 2023

<b>Visit</b>	Proposal 17358, SPARS25a (01) <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/IR Special Requirements: BEFORE 01-FEB-2024:00:00:00
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<b>Diagnostics</b>	(SPARS25a (01)) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=11			252.937441 Secs (252.937 Secs) [==>]	[1]
2	warm up flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F126N	SAMP-SEQ=SPARS 10; NSAMP=6			52.937106 Secs (52.937 Secs) [==>]	[1]
3	full flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F127M	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]
4	Persistence Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]



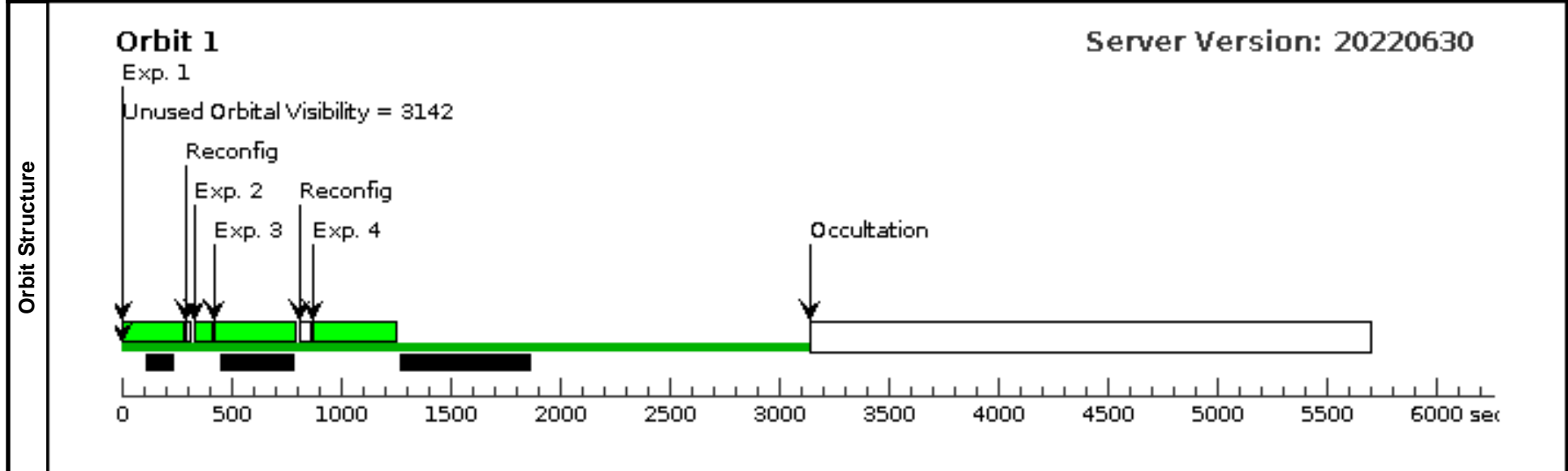
Proposal 17358 - SPARS25b (02) - WFC3 IR Linearity Monitor

Thu Jul 06 21:00:20 GMT 2023

<b>Visit</b>	Proposal 17358, SPARS25b (02) <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/IR Special Requirements: BEFORE 01-FEB-2024:00:00:00

<b>Diagnostics</b>	(SPARS25b (02)) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=11			252.937441 Secs (252.937 Secs) [==>]	[1]
2	warm up flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F126N	SAMP-SEQ=SPARS 10; NSAMP=6			52.937106 Secs (52.937 Secs) [==>]	[1]
3	full flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F127M	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]
4	Persistence Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]



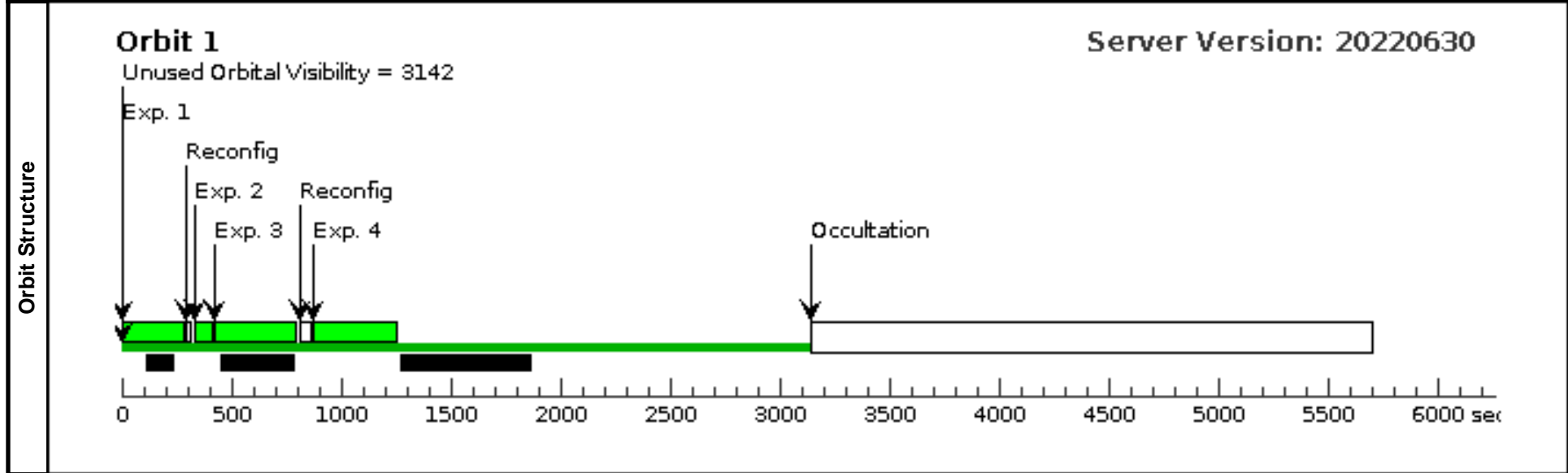
Proposal 17358 - SPARS25c (03) - WFC3 IR Linearity Monitor

Thu Jul 06 21:00:20 GMT 2023

<b>Visit</b>	Proposal 17358, SPARS25c (03) <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/IR Special Requirements: BEFORE 01-FEB-2024:00:00:00
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<b>Diagnostics</b>	(SPARS25c (03)) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=11			252.937441 Secs (252.937 Secs) [==>]	[1]
2	warm up flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F126N	SAMP-SEQ=SPARS 10; NSAMP=6			52.937106 Secs (52.937 Secs) [==>]	[1]
3	full flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F127M	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]
4	Persistence Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]



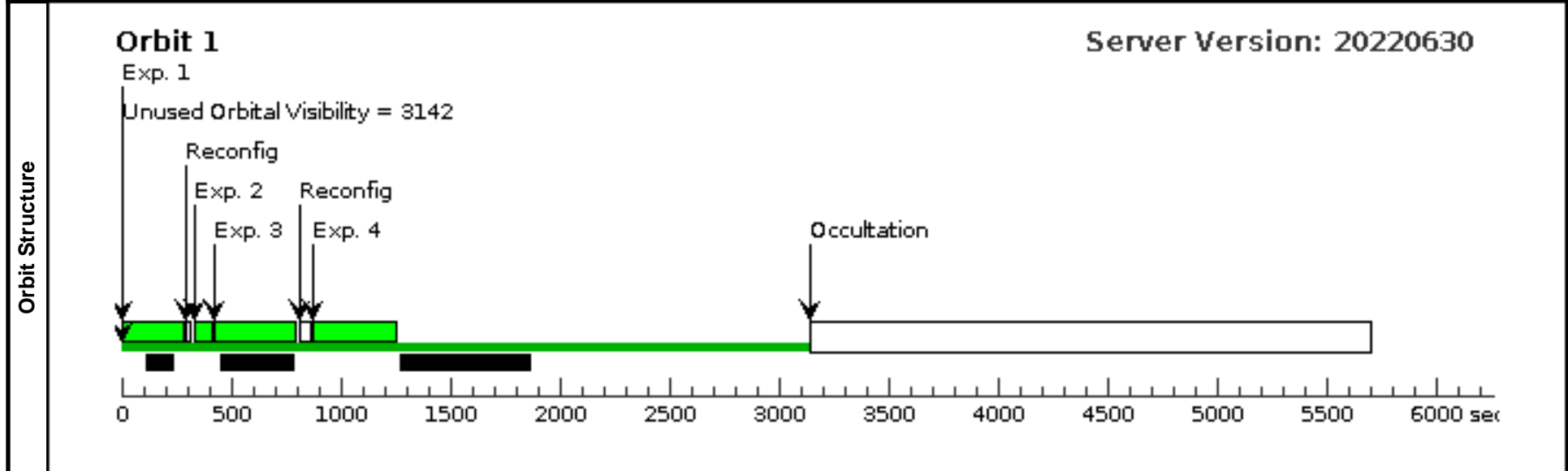
Proposal 17358 - SPARS25d (04) - WFC3 IR Linearity Monitor

Thu Jul 06 21:00:20 GMT 2023

<b>Visit</b>	Proposal 17358, SPARS25d (04) <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/IR Special Requirements: BEFORE 01-FEB-2024:00:00:00

<b>Diagnostics</b>	(SPARS25d (04)) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=11			252.937441 Secs (252.937 Secs) [==>]	[1]
2	warm up flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F126N	SAMP-SEQ=SPARS 10; NSAMP=6			52.937106 Secs (52.937 Secs) [==>]	[1]
3	full flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F127M	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]
4	Persistence Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]



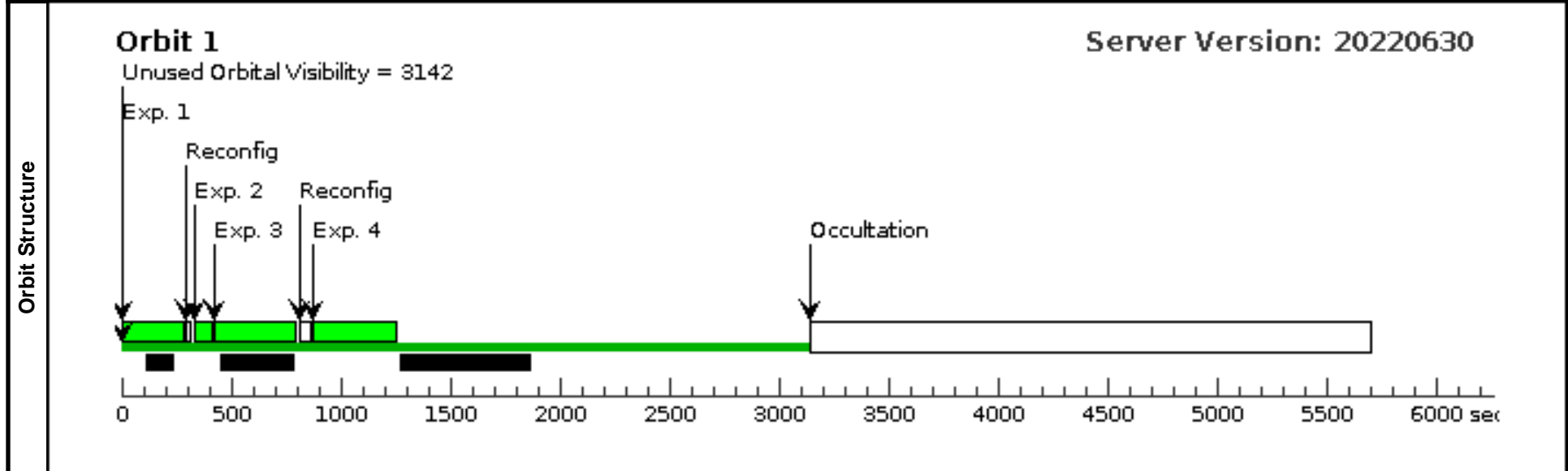
Proposal 17358 - SPARS25e (05) - WFC3 IR Linearity Monitor

Thu Jul 06 21:00:20 GMT 2023

<b>Visit</b>	Proposal 17358, SPARS25e (05) <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/IR Special Requirements: BEFORE 01-FEB-2024:00:00:00

<b>Diagnostics</b>	(SPARS25e (05)) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=11			252.937441 Secs (252.937 Secs) [==>]	[1]
2	warm up flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F126N	SAMP-SEQ=SPARS 10; NSAMP=6			52.937106 Secs (52.937 Secs) [==>]	[1]
3	full flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F127M	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]
4	Persistence Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]



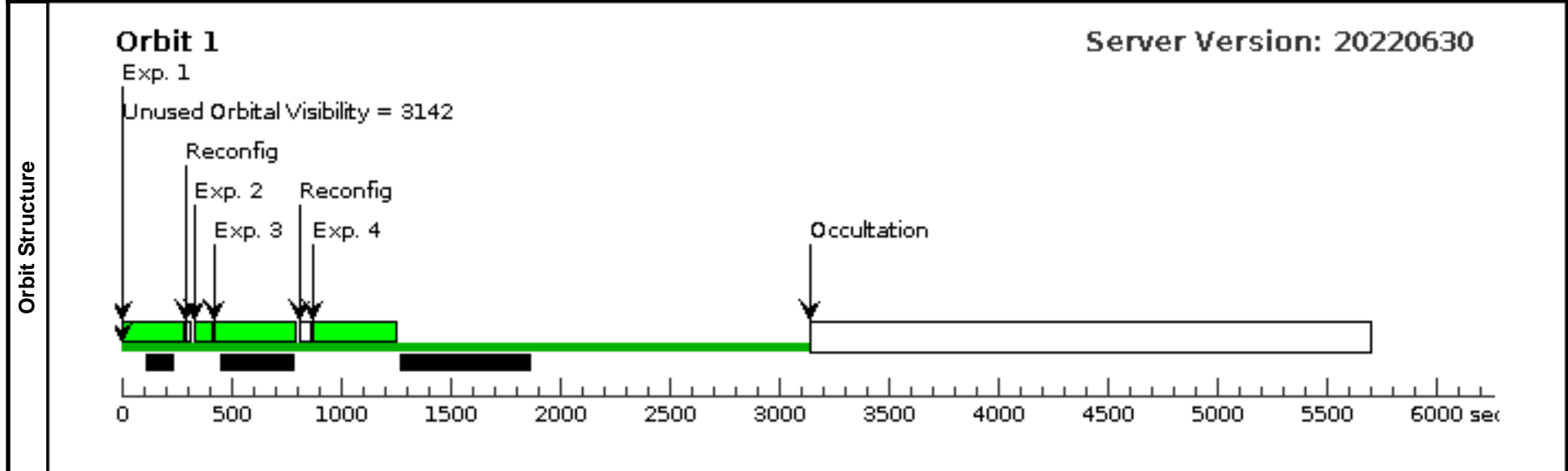
Proposal 17358 - SPARS25f (06) - WFC3 IR Linearity Monitor

Thu Jul 06 21:00:20 GMT 2023

<b>Visit</b>	Proposal 17358, SPARS25f (06) <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/IR Special Requirements: BEFORE 01-FEB-2024:00:00:00
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<b>Diagnostics</b>	(SPARS25f (06)) Warning (Orbit Planner): MAXIMUM DURATION EXCEEDED FOR INTERNAL OR EARTH CALIB SU
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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=11			252.937441 Secs (252.937 Secs) [==>]	[1]
2	warm up flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F126N	SAMP-SEQ=SPARS 10; NSAMP=6			52.937106 Secs (52.937 Secs) [==>]	[1]
3	full flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F127M	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]
4	Persistence Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]

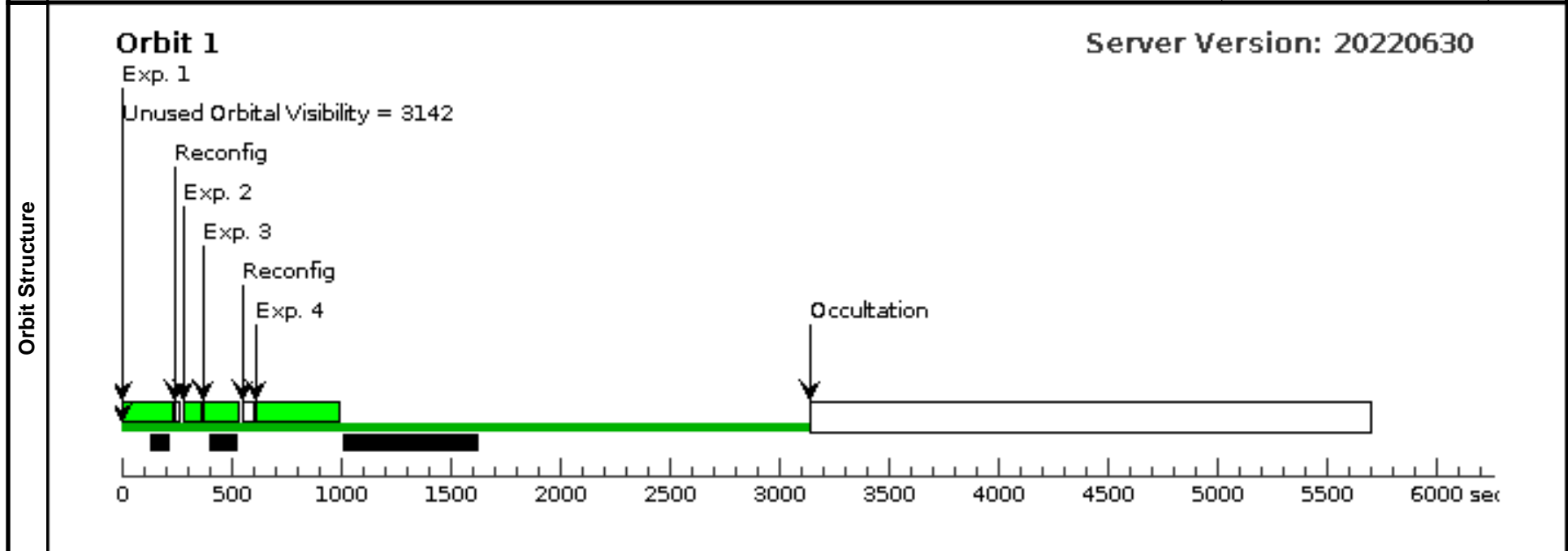


Proposal 17358 - SPARS10a (07) - WFC3 IR Linearity Monitor

Thu Jul 06 21:00:20 GMT 2023

<b>Visit</b>	Proposal 17358, SPARS10a (07)								
	Diagnostic Status: No Diagnostics								
	Scientific Instruments: WFC3/IR								
	Special Requirements: BEFORE 01-FEB-2024:00:00:00								

<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 100; NSAMP=3			202.932937 Secs (202.933 Secs) [==>]	[1]
	2	warm up flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F126N	SAMP-SEQ=SPARS 50; NSAMP=2			52.932742 Secs (52.933 Secs) [==>]	[1]
	3	full flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F127M	SAMP-SEQ=SPARS 10; NSAMP=15			142.945773 Secs (142.946 Secs) [==>]	[1]
4	Persistence Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]	

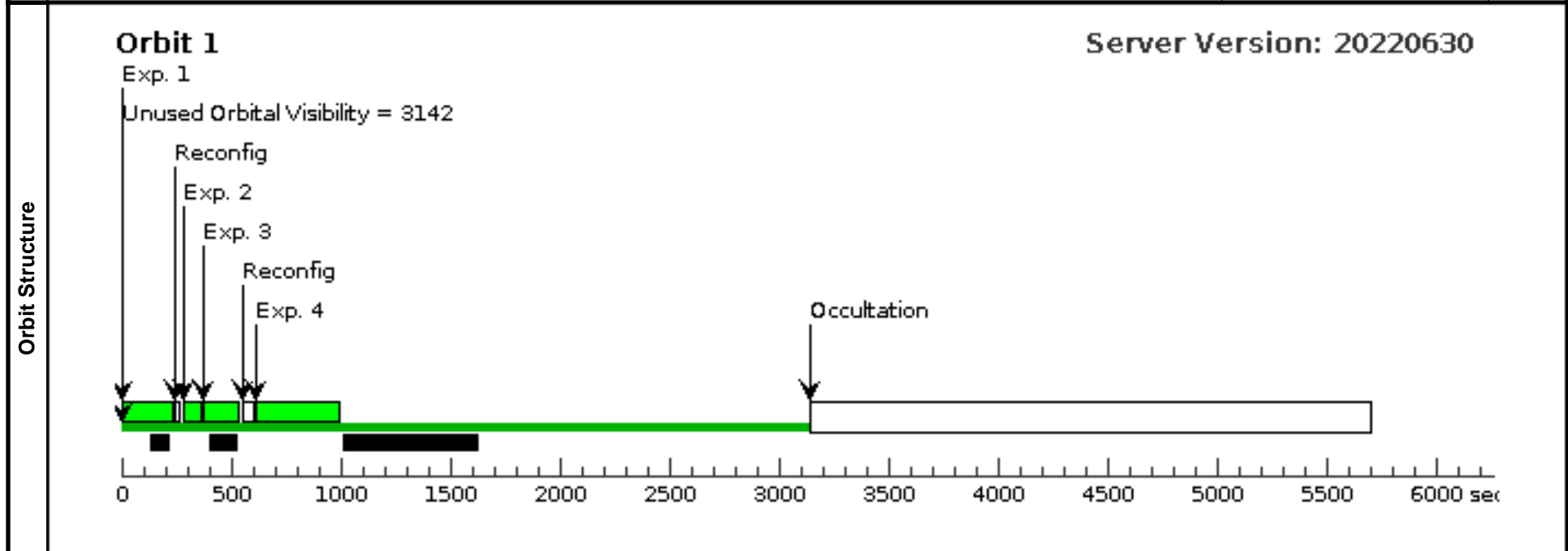


Proposal 17358 - SPARS10b (08) - WFC3 IR Linearity Monitor

Thu Jul 06 21:00:20 GMT 2023

<b>Visit</b>	<b>Proposal 17358, SPARS10b (08)</b>									
	<b>Diagnostic Status: No Diagnostics</b>									
	Scientific Instruments: WFC3/IR									
	Special Requirements: BEFORE 01-FEB-2024:00:00:00									

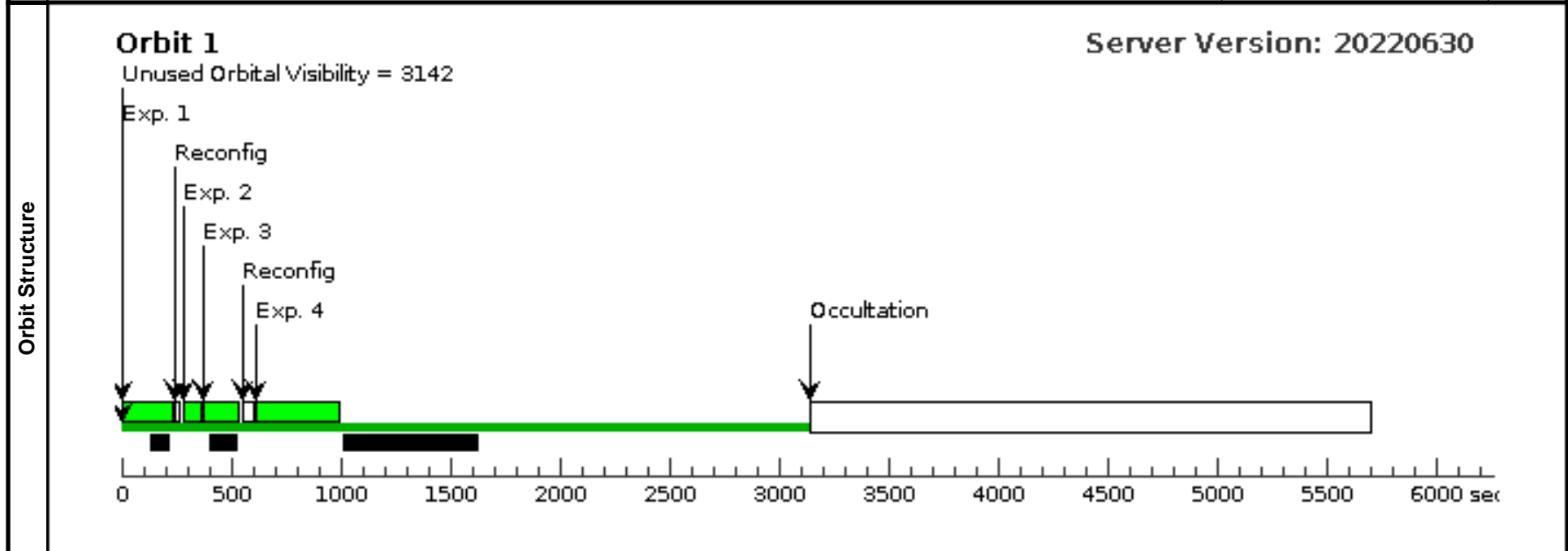
<b>Exposures</b>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 100; NSAMP=3			202.932937 Secs (202.933 Secs) [==>]	[1]
	2	warm up flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F126N	SAMP-SEQ=SPARS 50; NSAMP=2			52.932742 Secs (52.933 Secs) [==>]	[1]
	3	full flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F127M	SAMP-SEQ=SPARS 10; NSAMP=15			142.945773 Secs (142.946 Secs) [==>]	[1]
4	Persistence Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]	[1]	



Proposal 17358 - SPARS10c (09) - WFC3 IR Linearity Monitor

Thu Jul 06 21:00:20 GMT 2023

Visit	Proposal 17358, SPARS10c (09)									
	Diagnostic Status: No Diagnostics									
Scientific Instruments: WFC3/IR										
Special Requirements: BEFORE 01-FEB-2024:00:00:00										
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
1	Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 100; NSAMP=3			202.932937 Secs (202.933 Secs) [==>]		[1]
2	warm up flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F126N	SAMP-SEQ=SPARS 50; NSAMP=2			52.932742 Secs (52.933 Secs) [==>]		[1]
3	full flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F127M	SAMP-SEQ=SPARS 10; NSAMP=15			142.945773 Secs (142.946 Secs) [==>]		[1]
4	Persistence Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs) [==>]		[1]



Proposal 17358 - SPARS10d (10) - WFC3 IR Linearity Monitor

Thu Jul 06 21:00:20 GMT 2023

Visit	Proposal 17358, SPARS10d (10)									
	Diagnostic Status: No Diagnostics									
Scientific Instruments: WFC3/IR										
Special Requirements: BEFORE 01-FEB-2024:00:00:00										
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
Exposures	1	Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 100; NSAMP=3			202.932937 Secs (202.933 Secs)	[1]
									[==>]	
	2	warm up flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F126N	SAMP-SEQ=SPARS 50; NSAMP=2			52.932742 Secs (52.933 Secs)	[1]
									[==>]	
3	full flat	TUNGSTEN	WFC3/IR, MULTIACCUM, IR	F127M	SAMP-SEQ=SPARS 10; NSAMP=15			142.945773 Secs (142.946 Secs)	[1]	
								[==>]		
4	Persistence Dark	DARK	WFC3/IR, MULTIACCUM, IR	BLANK	SAMP-SEQ=SPARS 25; NSAMP=15			352.939501 Secs (352.94 Secs)	[1]	
								[==>]		

