



16413 - WFC3 Astrometric Scale Monitoring

Cycle: 28, Proposal Category: CAL/WFC3

(Availability Mode: RESTRICTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. Vera Kozhurina-Platais (PI) (Contact)	Space Telescope Science Institute	verap@stsci.edu
Varun Bajaj (CoI)	Space Telescope Science Institute	vbajaj@stsci.edu

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) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:12.0	yes
02	(1) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:12.0	yes
03	(1) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:13.0	yes
04	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:13.0	yes
05	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:13.0	yes
06	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:13.0	yes
07	(1) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:14.0	yes
08	(1) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:14.0	yes
09	(1) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:14.0	yes
10	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:14.0	yes
11	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:15.0	yes
12	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:15.0	yes
13	(1) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:15.0	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>
14	(1) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:16.0	yes
15	(1) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:16.0	yes
16	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:16.0	yes
17	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:16.0	yes
18	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:17.0	yes
87	(1) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:17.0	yes
88	(1) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:17.0	yes
89	(1) OMEGACEN	WFC3/UVIS	1	13-May-2021 18:00:18.0	yes
90	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:18.0	yes
91	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:18.0	yes
92	(1) OMEGACEN	WFC3/IR	1	13-May-2021 18:00:18.0	yes

24 Total Orbits Used

ABSTRACT

The standard astrometric catalog in the field of globular cluster Omega Cen has been used to examine the geometric distortion of WFC3 UVIS and IR as function of wavelength in multicycle calibration programs over last 11 years of WFC3 on HST board. All observations from these programs have been reduced and provided the multi-wavelength geometric distortion in UVIS and IR detector. The derived geometric distortion coefficients implemented in the IDCTAB format are used in the HST pipe-line to correct for a ~7% distortion in WFC3/UVIS and IR images down to <1%.

Additional to multi-wavelength WFC3 geometric distortion, all observations of Omega Cen taken through F606W and F160W UVIS and IR filters respectively during the last 11 years (all together 12 epochs) were used to look for time dependency of UVIS and IR geometric distortion and the effect of the scale change due to the thermal breathing. The results of the stability WFC3 geometric distortion published in WFC3-ISR-2015-02 (Kozhurina-Platais & Anderson, 2015), WFC3-2019-09 (Martlin, Kozhurina-Platais), have show that the UVIS geometric distortion is stable over 10 years on-orbit within 0.05 pixels or 2 mas in UVIS. The results of WFC3/IR published in WFC3-ISR-09-19 (M. McKay, Kozhurina-Platais, et al) have show that the IR geometric distortion is stable over 10 years on orbits within 0.1 pixel or 2 mas.

The purpose of this calibration proposal is to continue the monitor of the WFC3 geometric distortion stability of over time. The observations of

Omega Cen through the UVIS F606W filter and the F160W IR filter will be used to derive the skew and scale terms of the geometric distortion and look for any secular changes over time.

OBSERVING DESCRIPTION

Observing_Description:

The observation of Omega Cen through F606W and F160W is used as a standard filter in UVIS and IR, respectively. They are observed with the same pointing but with different roll-angle of the OTA in three time periods - between January 2021 and February 2021; between March 2021 and April 2021; and between June 2021 and September 2021.

The set of 6 exposures in F606W and F160W filters are the allowed full range of roll-angles at the ecliptic latitude of Omega Cen, and ranged approximately from 10 to 350 degree during the Cycle 28 from January 2021 to September 2021 timeframe. Three UVIS exposures and IR 3 exposures in visits 1- 6 will be observed in the following sequence of off-nominal (~ 300 degree) roll-angle.

The next three UVIS exposures and 3 IR exposures in visits 7-12 orbits will be observed in the sequence from off-nominal roll-angle 350 degree. The last three UVIS exposures and 3 IR exposures in 13-18 visit will be observed in the sequence from off-nominal roll-angle 150 degree.

In order to improve the schedule, a small range of roll is allowed at each specific roll angle. The order of the exposures in each orbit is specified by a SEQUENTIAL Special Requirement and the order of the visit is specified by AFTER Special Requirements. To maintain accurate pointing control, 2-guide star acquisitions are used. If suitable guide stars can be found, the same pair of guide stars are used for all 18 exposures.

The geometric distortion of WFC3 in 13 UVIS and 8 IR filters were calibrated using the standard astrometric catalog of Omega Cen (Anderson & van der Martel, 2010). A more recent set of updated distortions were obtained for 20 UVIS filters using the same standard astrometric catalog of Omega Cen in 2018 (Martlin et al. WFC3-ISR-2018-110). The goal of this proposal is to monitor the geometric distortion of both the UVIS and IR detectors. The skew parameter in the ACS/WFC case, is changing with time in the level of 40 mas over 15 years on board of HST. The skew parameter is the non-perpendicularity of coordinate axes and is the major parameter in the geometric distortion model.

As it has shown by Kozhurina-Platais et al (WFC3-ISR -2015-02), the skew in UVIS geometric distortion model during 7 years of WFC3 on board is stable and in the range of +/-4 mas which gives the offset at << +/-0.1 pixels at the far edges of UVIS frames. Thus, the goal of this calibration proposal is to continue to monitor the UVIS and IR skew as a function of time.

Proposal 16413 (STScI Edit Number: 8, Created: Thursday, May 13, 2021 at 5:00:19 PM Eastern Standard Time) - Overview

The 3 exposures in UVIS with steps of roll-angles ± 5 degree of off-nominal roll-angles require 3 orbits, the same 3 exposures in IR with the steps of roll-angles ± 5 degree of nominal roll-angles, also require 3 orbits. However, APT requires each Visit to begin at the start of an orbit and therefore calculates that this proposal requires 18 orbits, which APT indicates is mostly unused. Accordingly, APT generates a Warning that the Visits will not fit within the required 2 orbits and 10 Warnings that the SEQUENTIAL sets cannot fit within one orbit. However, based upon known overheads for the moderate roll-slews used and overheads for full guide star acquisitions, these indicated VISITS (1,2,3, with UVIS and 4,5,6 with IR) should be scheduled in 2 orbits. The exposures with UVIS are: Orbit #1, Visits 1,2,3 off-nominal roll $\pm 5, \pm 5$ degree; Orbit #2, Visits 7,8,9 off-nominal roll $\pm 5, 0, \pm 5$ degree; Orbit #3, Visits 13,14,15 off-nominal roll $\pm 5, 0, \pm 5$ degree. The similar requirement for exposures with IR are: Orbit #1, Visits 3,4,5 off-nominal roll $\pm 5, 0, \pm 5$ degree; Orbit #2, Visits 10,11,12 off-nominal roll $\pm 5, 0, \pm 5$ degree; and Orbit #3, Visits 16,17,18 off-nominal roll $\pm 5, 0, \pm 5$ degree.

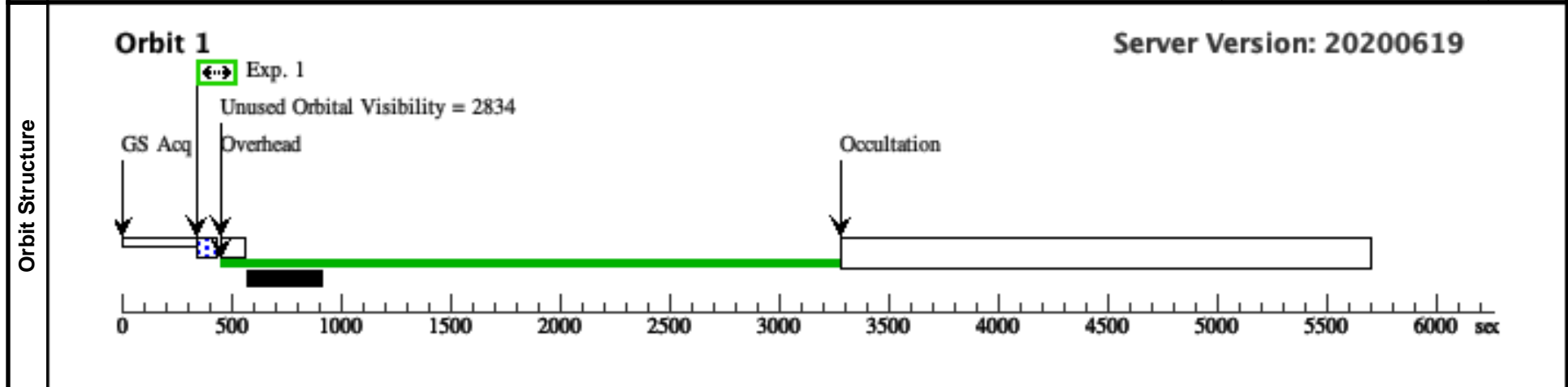
Proposal 16413 - Visit 01 F606W (01) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 01 F606W (01), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/UVIS				
	Special Requirements: ORIENT 313D TO 313 D; BETWEEN 20-FEB-2021:00:00:00 AND 25-FEB-2021:00:00:00; SEQ 01,02,03 WITHIN 1.1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



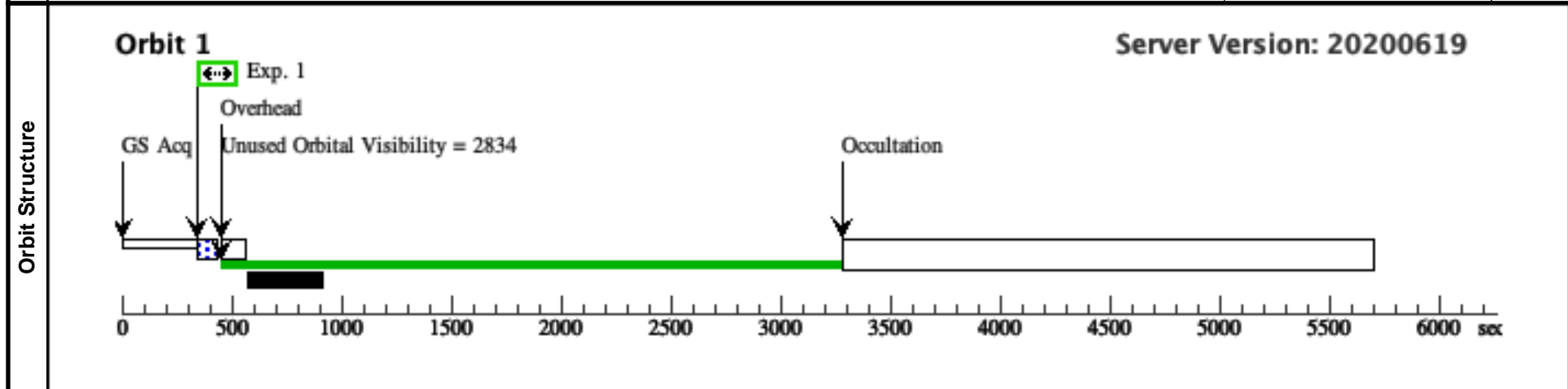
Proposal 16413 - Visit 02 F606W (02) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 02 F606W (02), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/UVIS				
	Special Requirements: ORIENT 315D TO 315 D; BETWEEN 20-FEB-2021:00:00:00 AND 25-FEB-2021:00:00:00; SEQ 01,02,03 WITHIN 1.1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



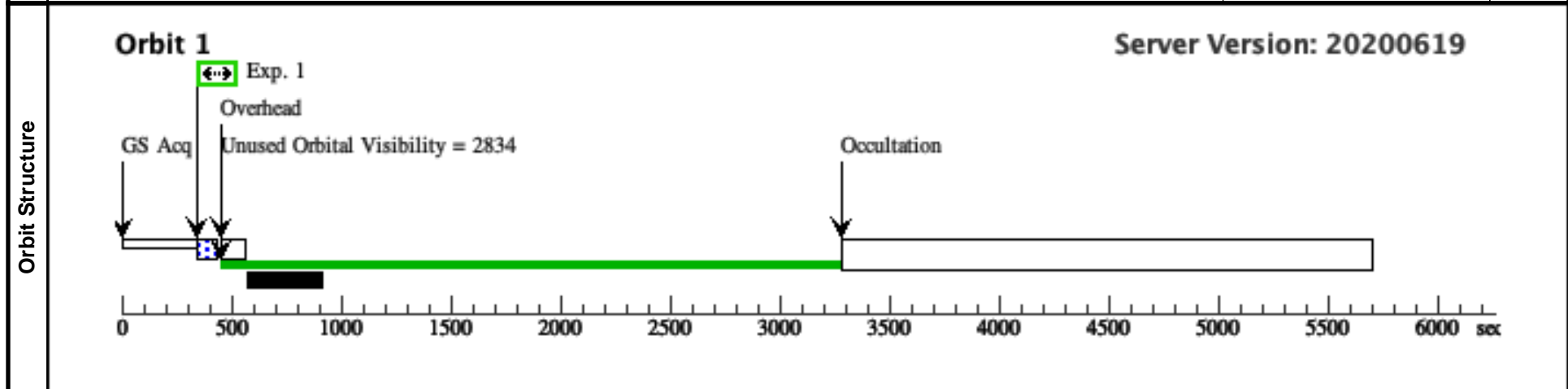
Proposal 16413 - Visit 03 F606W (03) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 03 F606W (03), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/UVIS				
	Special Requirements: ORIENT 317D TO 317 D; BETWEEN 20-FEB-2021:00:00:00 AND 25-FEB-2021:00:00:00; SEQ 01,02,03 WITHIN 1.1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



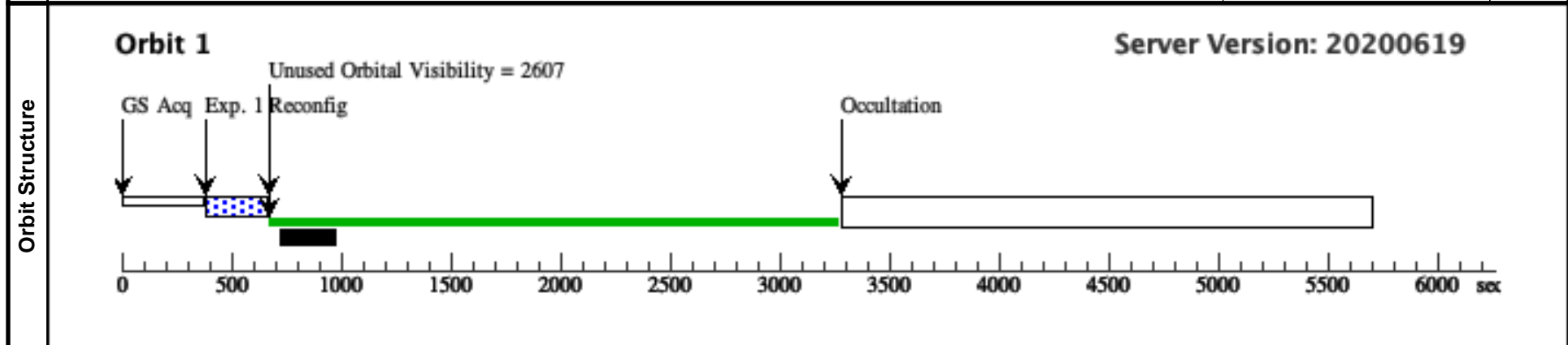
Proposal 16413 - Visit 04 F160W (04) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 04 F160W (04), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: PCS MODE FINE; ORIENT 313.5D TO 313.5 D; BETWEEN 20-FEB-2021:00:00:00 AND 25-FEB-2021:00:00:00; SEQ 04,05,06 WITHIN 1.1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3		252.937441 Secs (252.937 Secs) [==>]	[1]



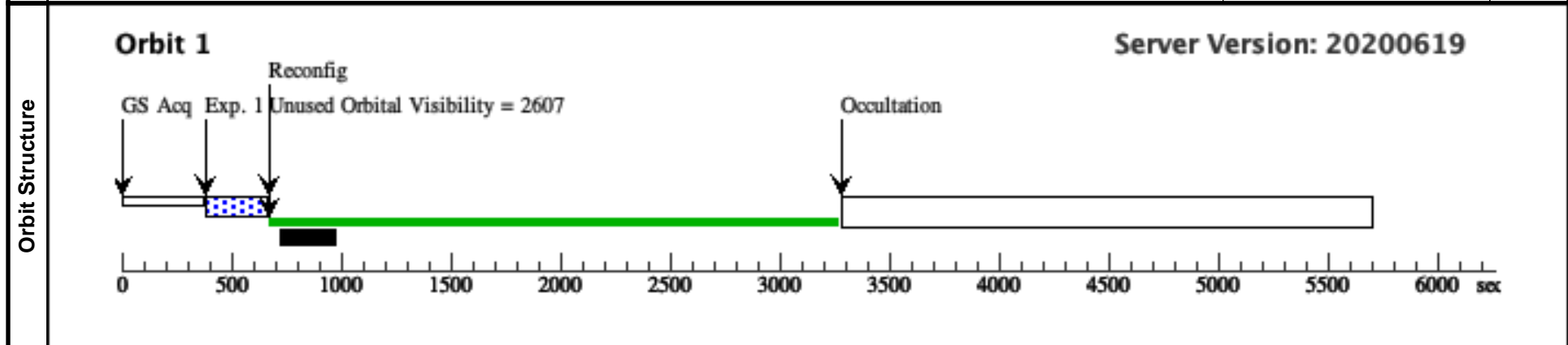
Proposal 16413 - Visit 05 F160W (05) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 05 F160W (05), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: PCS MODE FINE; ORIENT 315D TO 315 D; BETWEEN 20-FEB-2021:00:00:00 AND 25-FEB-2021:00:00:00; SEQ 04,05,06 WITHIN 1.1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3		252.937441 Secs (252.937 Secs) [==>]	[1]



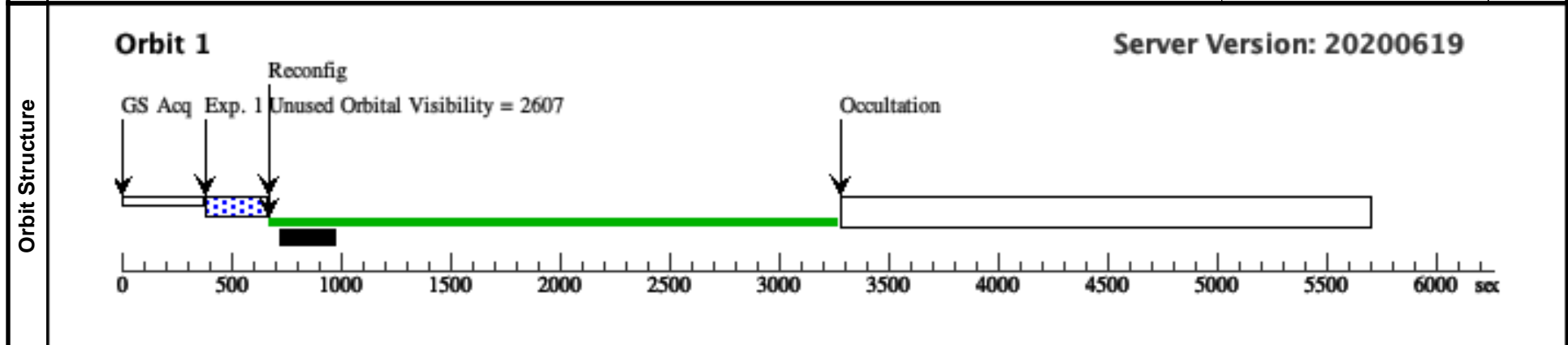
Proposal 16413 - Visit 06 F160W (06) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 06 F160W (06), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: PCS MODE FINE; ORIENT 316.5D TO 316.5 D; BETWEEN 20-FEB-2021:00:00:00 AND 25-FEB-2021:00:00:00; SEQ 04,05,06 WITHIN 1.1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3			252.937441 Secs (252.937 Secs) [==>]



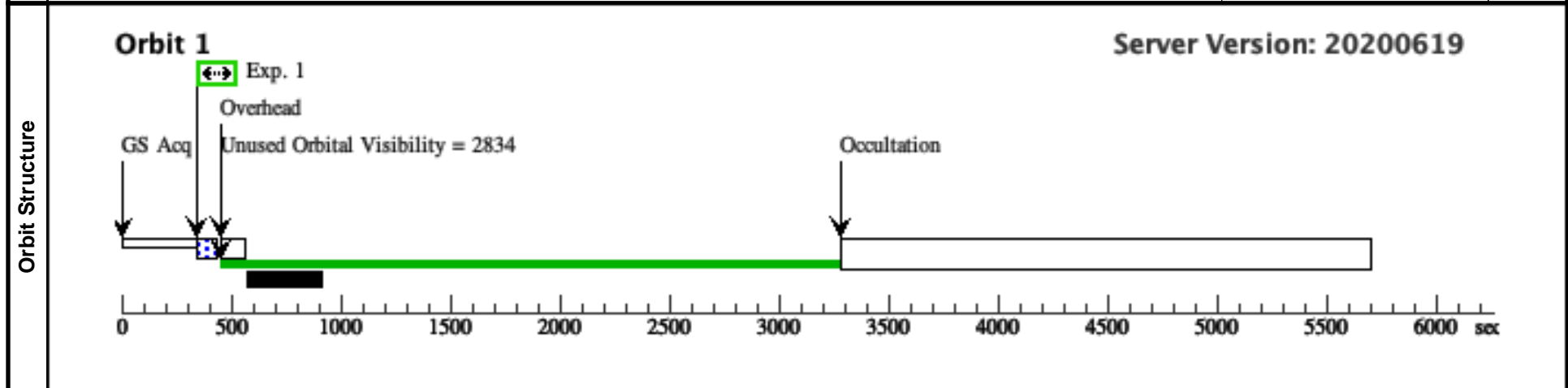
Proposal 16413 - Visit 07 F606W (07) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 07 F606W (07), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/UVIS				
	Special Requirements: ORIENT 325D TO 325 D; BETWEEN 01-MAR-2021:00:00:00 AND 01-MAY-2021:00:00:00; SEQ 07,08,09 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



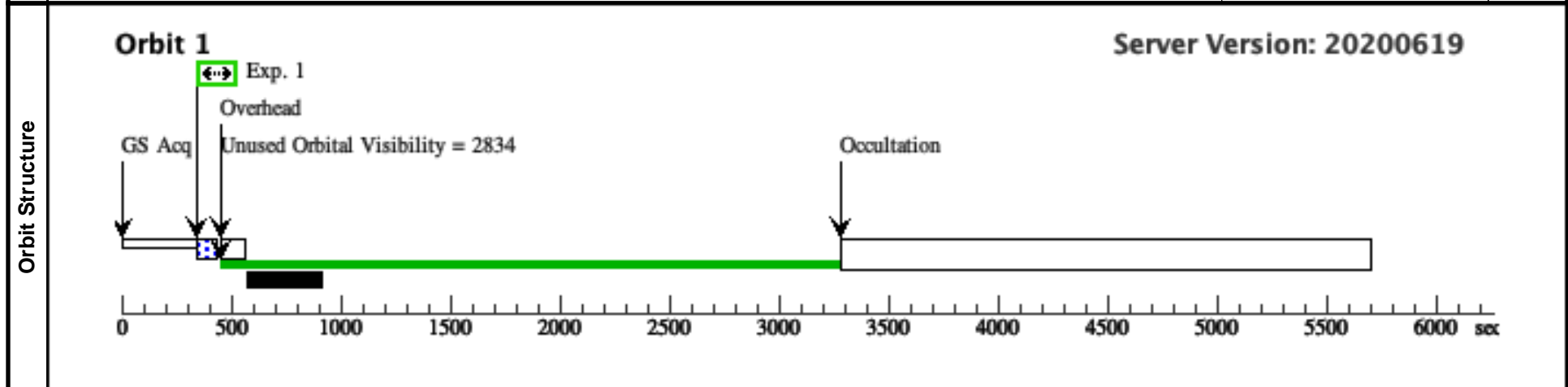
Proposal 16413 - Visit 08 F606W (08) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 08 F606W (08), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/UVIS				
	Special Requirements: ORIENT 327D TO 327 D; BETWEEN 01-MAR-2021:00:00:00 AND 01-MAY-2021:00:00:00; SEQ 07,08,09 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



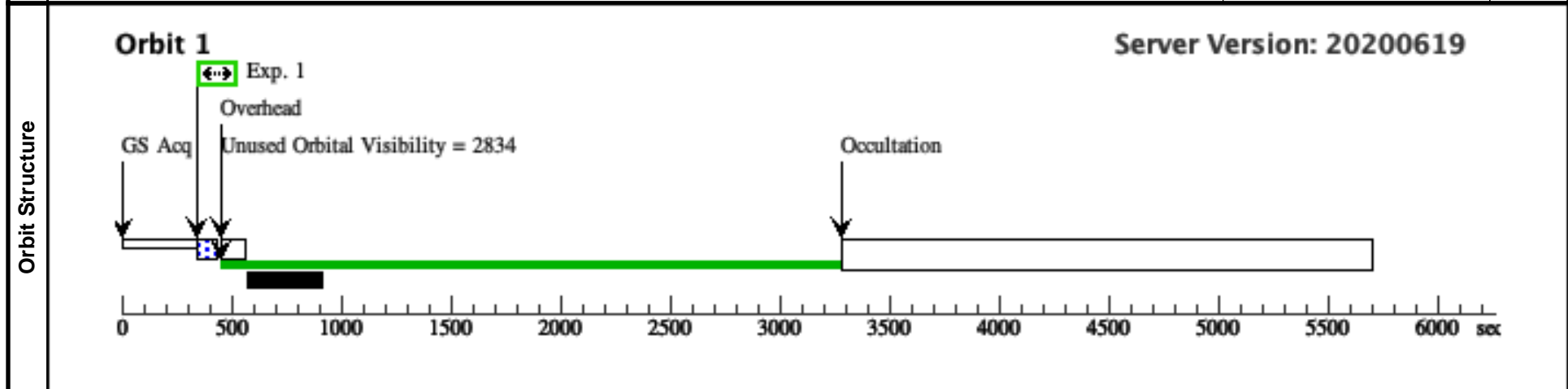
Proposal 16413 - Visit 09 F606W (09) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 09 F606W (09), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/UVIS				
	Special Requirements: ORIENT 328.5D TO 328.5 D; BETWEEN 01-MAR-2021:00:00:00 AND 01-MAY-2021:00:00:00; SEQ 07,08,09 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



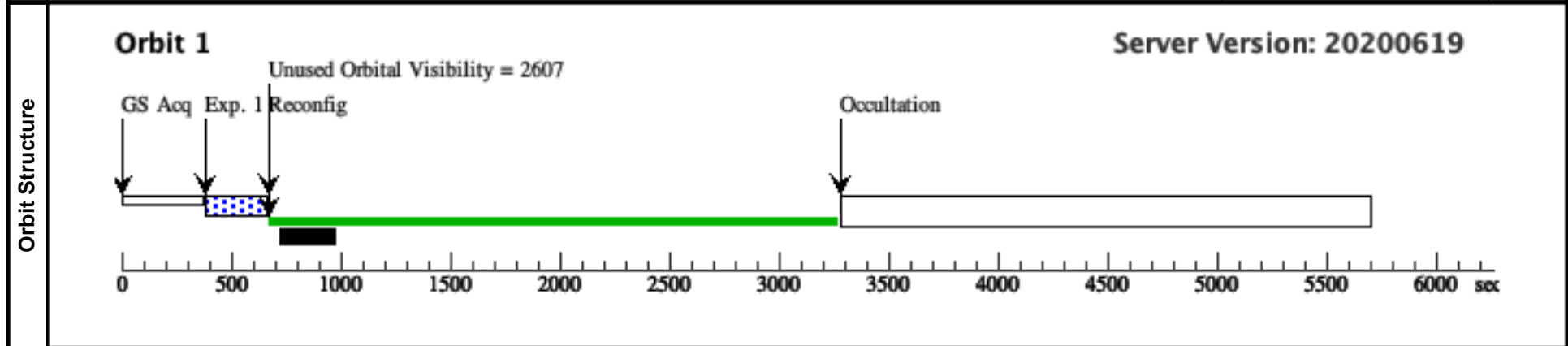
Proposal 16413 - Visit 10 F160W (10) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 10 F160W (10), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: PCS MODE FINE; ORIENT 325D TO 325 D; BETWEEN 01-MAR-2021:00:00:00 AND 01-MAY-2021:00:00:00; SEQ 10,11,12 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals					
	Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3		252.937441 Secs (252.937 Secs) [==>]	[1]



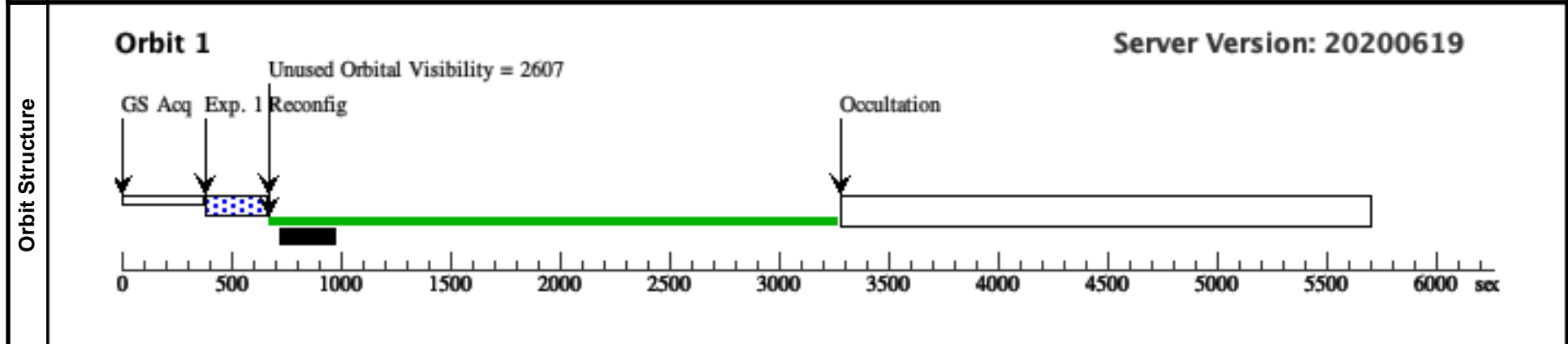
Proposal 16413 - Visit 11 F160W (11) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 11 F160W (11), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: PCS MODE FINE; ORIENT 326.5D TO 326.5 D; BETWEEN 01-MAR-2021:00:00:00 AND 01-MAY-2021:00:00:00; SEQ 10,11,12 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3		252.937441 Secs (252.937 Secs) [==>]	[1]



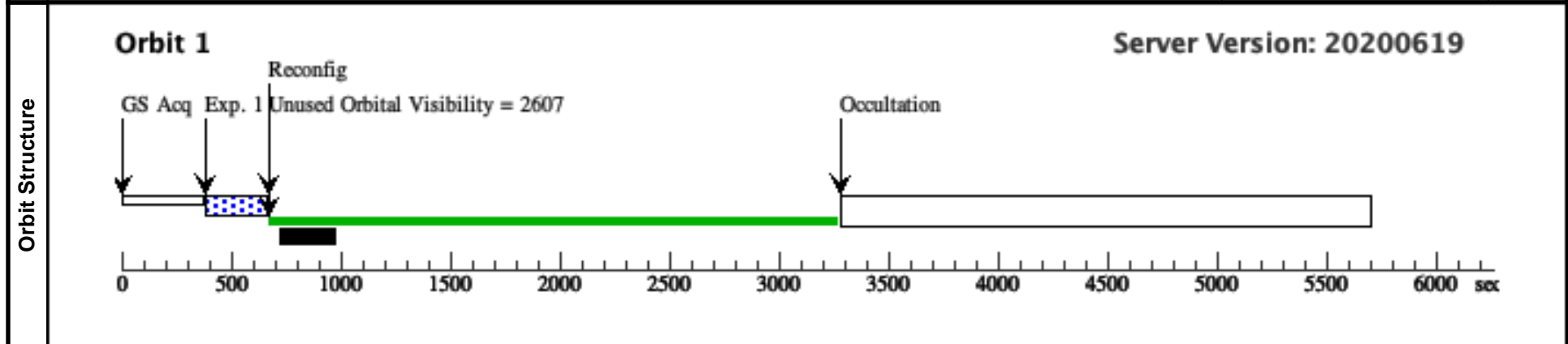
Proposal 16413 - Visit 12 F160W (12) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 12 F160W (12), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: PCS MODE FINE; ORIENT 328D TO 328 D; BETWEEN 01-MAR-2021:00:00:00 AND 01-MAY-2021:00:00:00; SEQ 10,11,12 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3		252.937441 Secs (252.937 Secs) [==>]	[1]



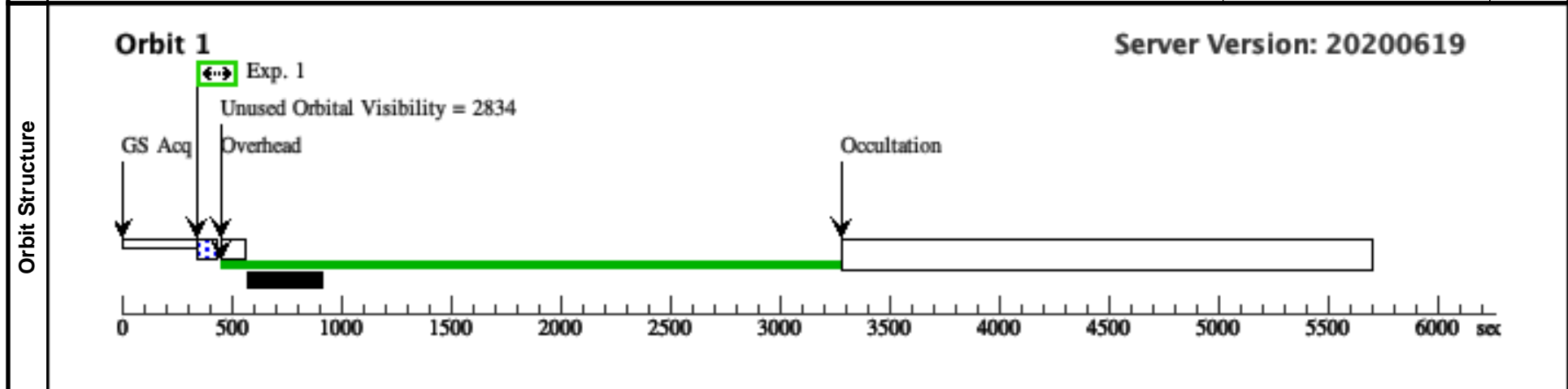
Proposal 16413 - Visit 13 F606W (13) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 13 F606W (13), implementation				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/UVIS				
	Special Requirements: ORIENT 133.5D TO 133.5 D; BETWEEN 01-JUN-2021:00:00:00 AND 01-OCT-2021:00:00:00; SEQ 13,14,15 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



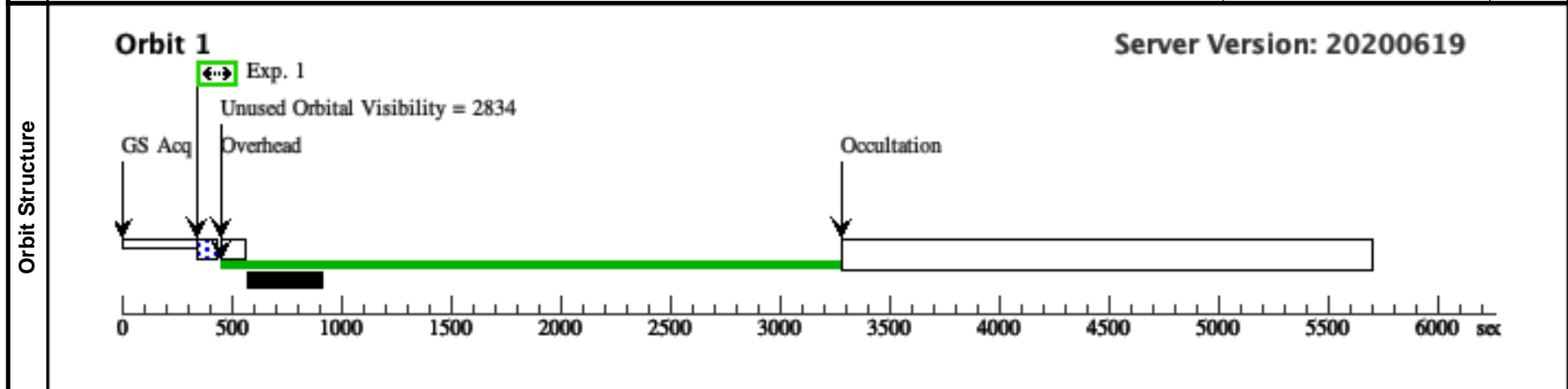
Proposal 16413 - Visit 14 F606W (14) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 14 F606W (14), implementation				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/UVIS				
	Special Requirements: ORIENT 135D TO 135 D; BETWEEN 01-JUN-2021:00:00:00 AND 01-OCT-2021:00:00:00; SEQ 13,14,15 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals					
	Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



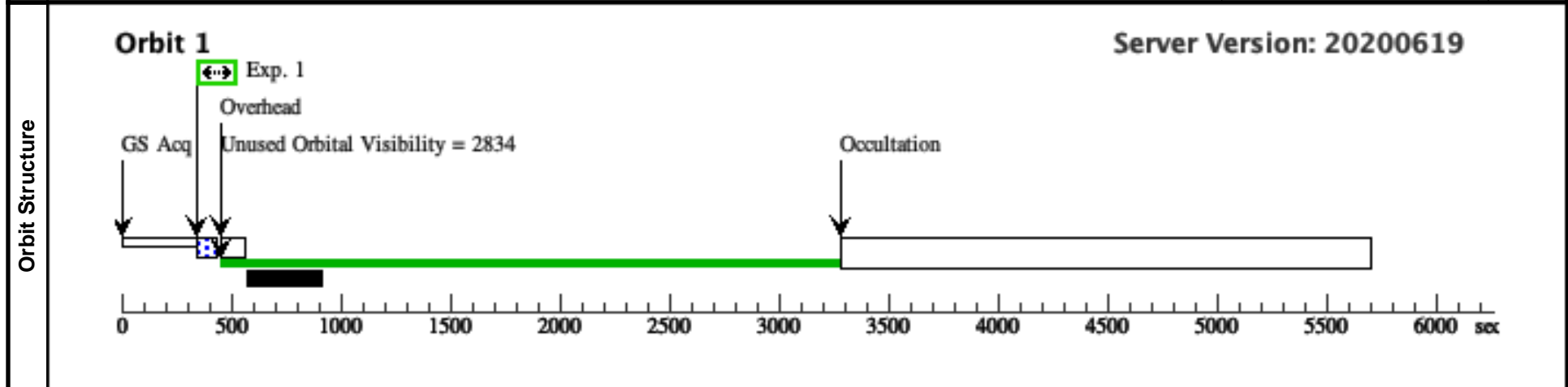
Proposal 16413 - Visit 15 F606W (15) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:19 GMT 2021

Visit	Proposal 16413, Visit 15 F606W (15), implementation				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/UVIS				
	Special Requirements: ORIENT 136.5D TO 136.5 D; BETWEEN 01-JUN-2021:00:00:00 AND 01-OCT-2021:00:00:00; SEQ 13,14,15 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



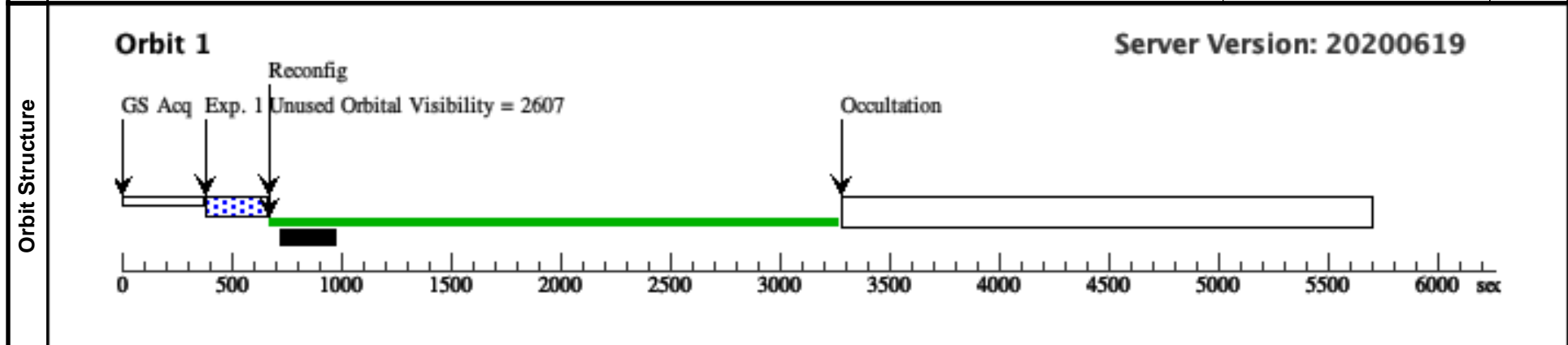
Proposal 16413 - Visit 16 F160W (16) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:20 GMT 2021

Visit	Proposal 16413, Visit 16 F160W (16), implementation				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: PCS MODE FINE; ORIENT 131.5D TO 131.5 D; BETWEEN 01-JUN-2021:00:00:00 AND 01-OCT-2021:00:00:00; SEQ 16,17,18 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals					
	Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3		252.937441 Secs (252.937 Secs) [==>]	[1]



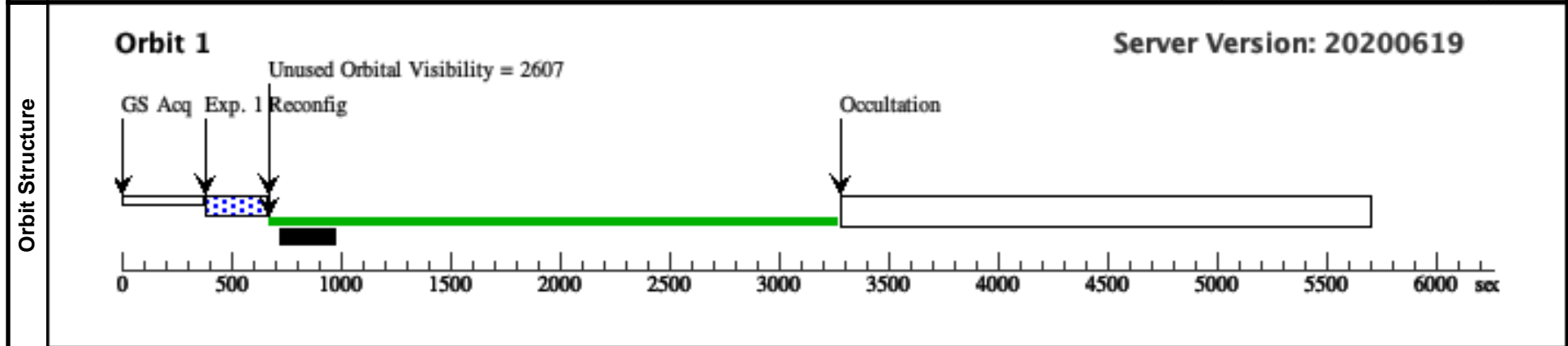
Proposal 16413 - Visit 17 F160W (17) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:20 GMT 2021

Visit	Proposal 16413, Visit 17 F160W (17), implementation				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: PCS MODE FINE; ORIENT 133D TO 133 D; BETWEEN 01-JUN-2021:00:00:00 AND 01-OCT-2021:00:00:00; SEQ 16,17,18 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3		252.937441 Secs (252.937 Secs) [==>]	[1]



Proposal 16413 - Visit 18 F160W (18) - WFC3 Astrometric Scale Monitoring

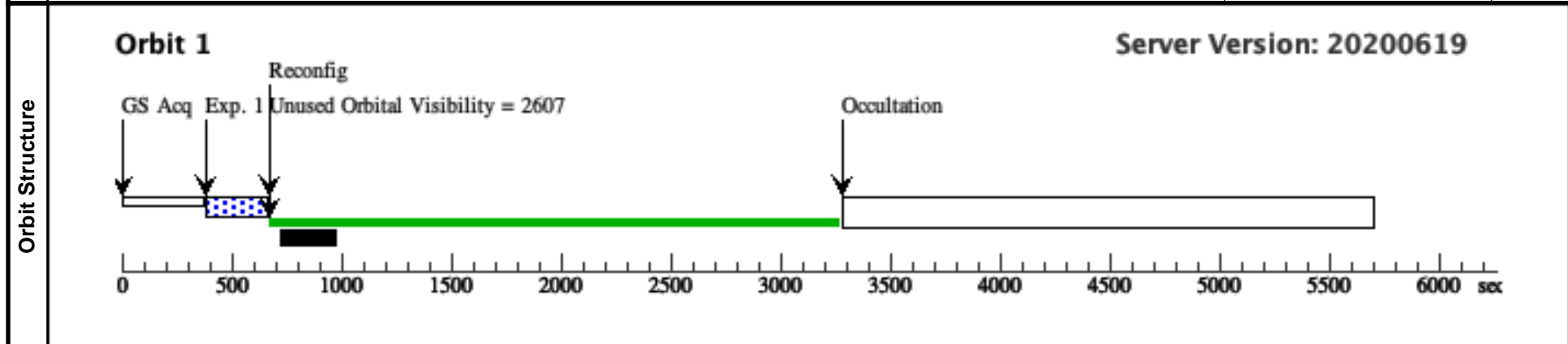
Thu May 13 22:00:20 GMT 2021

Visit	Proposal 16413, Visit 18 F160W (18), implementation				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: WFC3/IR				
	Special Requirements: PCS MODE FINE; ORIENT 134.5D TO 134.5 D; BETWEEN 01-JUN-2021:00:00:00 AND 01-OCT-2021:00:00:00; SEQ 16,17,18 WITHIN 1 Orbits				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS

Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals
 Category=CALIBRATION
 Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3		252.937441 Secs (252.937 Secs) [==>]	[1]



Proposal 16413 - Visit 87 F606W Recovery 07 repeat (87) - WFC3 Astrometric Scale Monitoring

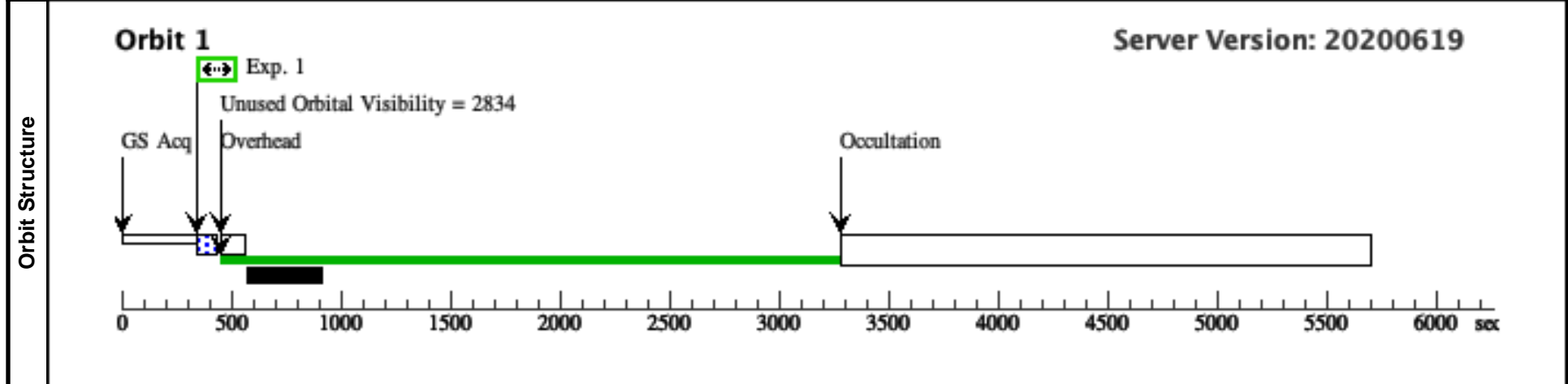
Thu May 13 22:00:20 GMT 2021

Visit	Proposal 16413, Visit 87 F606W Recovery 07 repeat (87), completed				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 325D TO 325 D; SEQ 87,88,89 WITHIN 1 Orbits <i>Comments: This is the repeat of Visit 07 for the WFC3 recovery validation.</i>				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS

Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals
 Category=CALIBRATION
 Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



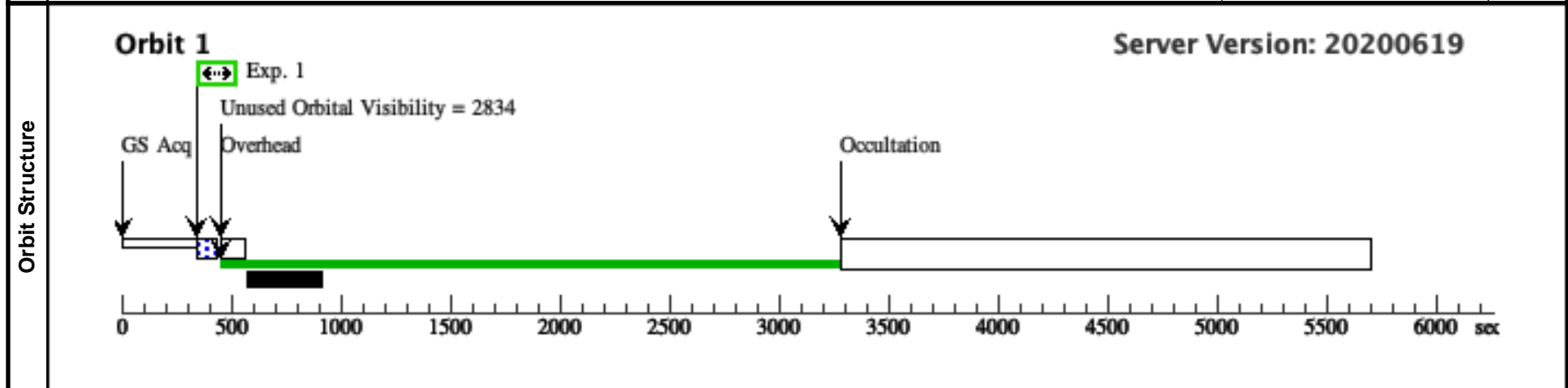
Proposal 16413 - Visit 88 F606W Recovery 08 repeat (88) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:20 GMT 2021

Visit	Proposal 16413, Visit 88 F606W Recovery 08 repeat (88), completed				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 327D TO 327 D; SEQ 87,88,89 WITHIN 1 Orbits <i>Comments: This is the repeat of Visit 07 for the WFC3 recovery validation.</i>				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



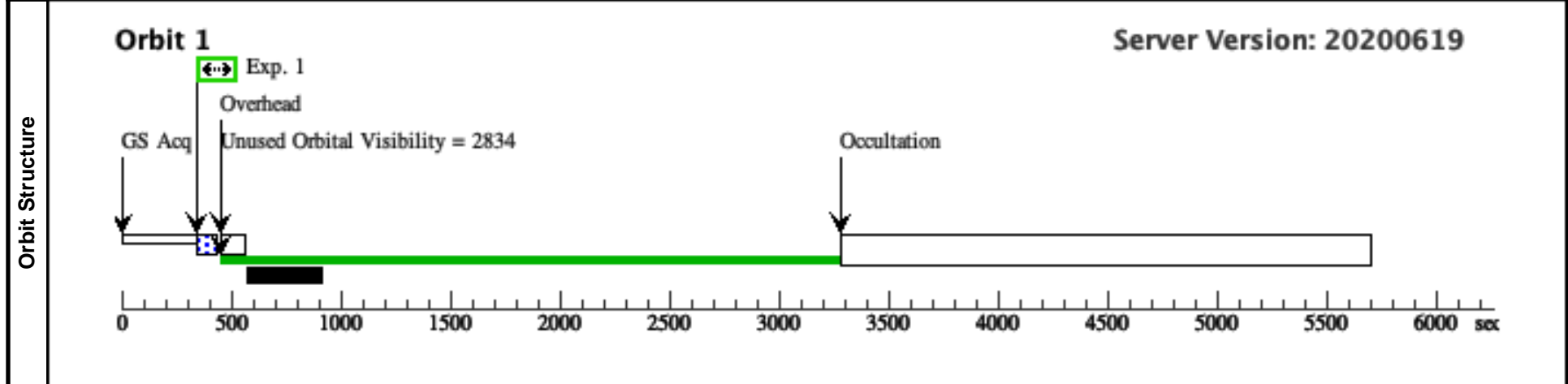
Proposal 16413 - Visit 89 F606W Recovery 09 repeat (89) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:20 GMT 2021

Visit	Proposal 16413, Visit 89 F606W Recovery 09 repeat (89), completed				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 328.5D TO 328.5 D; SEQ 87,88,89 WITHIN 1 Orbits <i>Comments: This is the repeat of Visit 09 for the WFC3 recovery validation.</i>				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]						

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W	(1) OMEGACEN	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=12	GS ACQ SCENARI O BASE1B3		60.0 Secs (60 Secs) [==>]	[1]



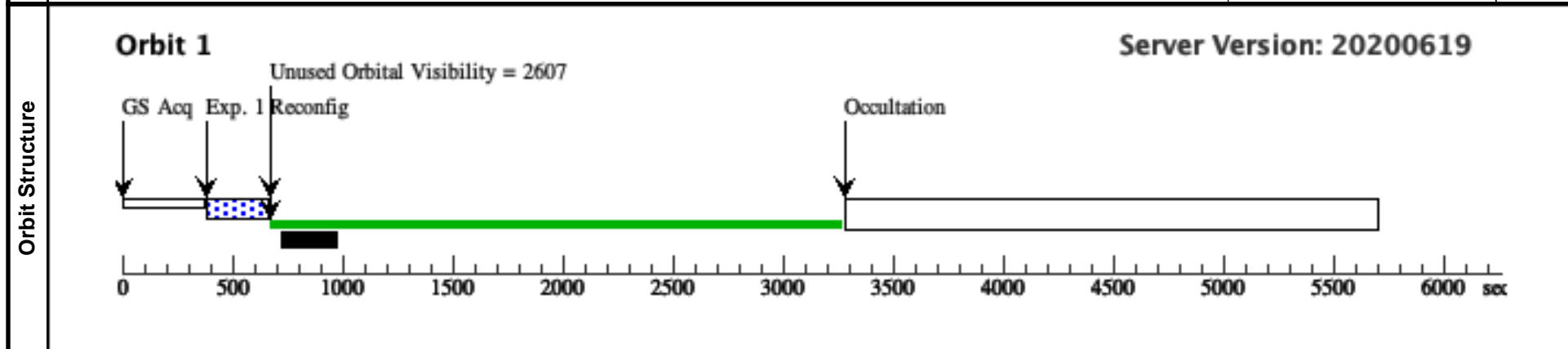
Proposal 16413 - Visit 90 F160W Recovery 10 repeat (90) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:20 GMT 2021

Visit	Proposal 16413, Visit 90 F160W Recovery 10 repeat (90), completed				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: PCS MODE FINE; ORIENT 325D TO 325 D; SEQ 90,91,92 WITHIN 1 Orbits <i>Comments: This is the repeat of Visit 10 for the WFC3 recovery validation.</i>				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3		252.937441 Secs (252.937 Secs) [==>]	[1]



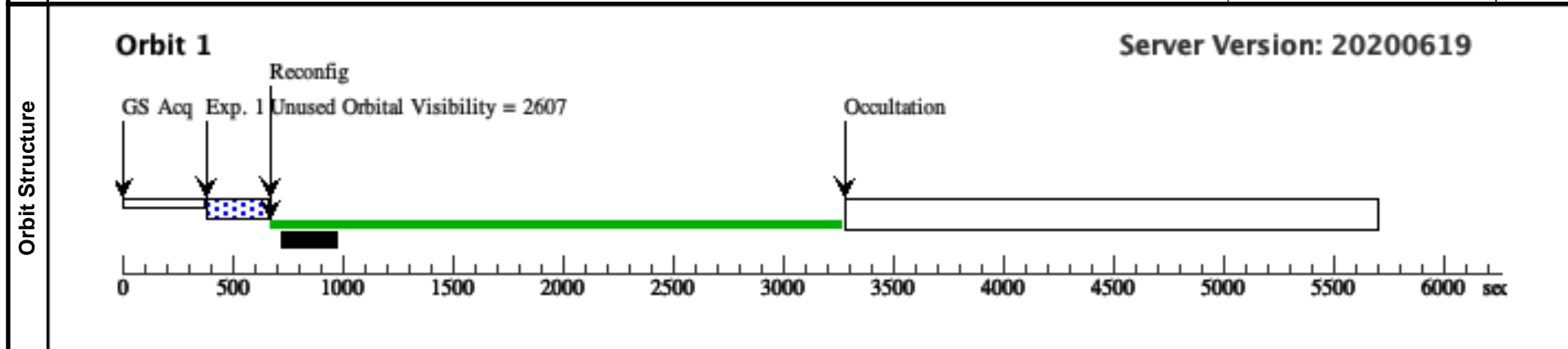
Proposal 16413 - Visit 91 F160W Recovery 11 repeat (91) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:20 GMT 2021

Visit	Proposal 16413, Visit 91 F160W Recovery 11 repeat (91), completed				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: PCS MODE FINE; ORIENT 326.5D TO 326.5 D; SEQ 90,91,92 WITHIN 1 Orbits <i>Comments: This is the repeat of Visit 11 for the WFC3 recovery validation.</i>				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3		252.937441 Secs (252.937 Secs) [==>]	[1]



Proposal 16413 - Visit 92 F160W Recovery 12 repeat (92) - WFC3 Astrometric Scale Monitoring

Thu May 13 22:00:20 GMT 2021

Visit	Proposal 16413, Visit 92 F160W Recovery 12 repeat (92), completed				
	Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: PCS MODE FINE; ORIENT 328D TO 328 D; SEQ 90,91,92 WITHIN 1 Orbits <i>Comments: This is the repeat of Visit 12 for the WFC3 recovery validation.</i>				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 46.2800 (201.6928333d) Dec: -47 28 44.60 (-47.47906d) Equinox: J2000		V=16.8+/-0.1	Reference Frame: ICRS
	<i>Comments: This is the same target (and coordinates) as used in CAL/WFC3 11911, UVIS L-Flats and Geometric Distortion and in other multi-cycles calibration proposals</i> Category=CALIBRATION Description=[ASTROMETRIC, SPATIAL DISTORTION TEST]					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F160W	(1) OMEGACEN	WFC3/IR, MULTIACCUM, IR	F160W	SAMP-SEQ=SPARS 25; NSAMP=11	EXP PCS MODE FI NE; GS ACQ SCENARI O BASE1B3		252.937441 Secs (252.937 Secs) [==>]	[1]

