15576 - WFC3 UVIS CTE Monitor (star cluster)

Cycle: 26, Proposal Category: CAL/WFC3

(Availability Mode: RESTRICTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
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Dr. Jay Anderson (CoI)	Space Telescope Science Institute	jayander@stsci.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(2) NGC-6791	WFC3/UVIS	1	07-Aug-2018 15:05:10.0	yes
02	(1) NGC-104	WFC3/UVIS	3	07-Aug-2018 15:05:13.0	yes
03	(2) NGC-6791	WFC3/UVIS	1	07-Aug-2018 15:05:15.0	yes
04	(1) NGC-104	WFC3/UVIS	3	07-Aug-2018 15:05:18.0	yes

8 Total Orbits Used

ABSTRACT

We monitor the Charge Transfer Efficiency (CTE) with changing epoch, varying target brightness, and varying image background. The aperture phometry-based CTE model and the empirical pixel-based CTE correction is derived and updated from the results of this proposal. NGC 6791 (a sparse cluster) and NGC 104 of 47 Tuc (a dense field) are the targets for this proposal, as these were the targets of former

WFC3 CTE monitor proposals. This allows for comparison to former CTE loss and changing CTE with field density. NGC 104 has been observed with varying post-flash levels and with ACS, which allows for comparison between ACS/WFC3 CTE and changing post-flash.

OBSERVING DESCRIPTION

We propose these 8 orbits to continue the external CTE monitoring proposals starting in cycle 17. The varying post-flash was used to estimate the impact of post-flash on CTE mitigation, starting in cycle 20.

When observed with filter F502N, the observation of NGC 6791 (a sparse cluster) and NGC 104 of 47 Tuc (a dense field) will monitor variation of CTE with field density. We dither long exposures by 2000 pixels vertically, so that the absolute CTE can be measured. Shorter exposures will provide a long to short flux ratio. With varying field density, post-flash, and exposure length, we build and maintain a CTE model based on many parameters. While historically the external CTE proposal was 3 epochs per cycle, the smooth and slow evolution of CTE degredation allows for fewer epochs.

We observe NGC 6791 using F502N in pairs of exposure with a difference of 2000 pixels vertically dithered.
As well as two long exposure pairs, one will have an applied post-flash of 12 electrons/pixel, which is the current reccomendation for CTE-mitigation.

NGC 104 orbits have one long and one short pair of exposures with no post-flash. One short exposure pair with post-flash of 12, and the remaining eight long pairs of exposures have varied post-flash from 6-130 electrons/pixel. This background was estimated by Bagget & Anderson 2012 (HST WFC3 ISR 2012-12). Like NGC 6791 the difference in the pairs will be a dither of 2000 pixels.

This proposals consists of eight total oribts over 2 epochs (4 per epoch) with 1 and 3 orbits on NGC 6791 and NGC 104 respectively per orbit.

This proposal a continuation of external CTE calibration from 17 to now 26, including CAL/WFC3 proposals 11924, 12379, 12692, 13083, 13566, 14012, 14378, 14541, 14990.

------- Scheduling -------

The CTE long-term monitoring observations will be taken at two epochs in Cycle 26, starting six months after the latest Cycle 25 observations. The first epoch should be scheduled in January/February 2019, the second epoch in July/August 2019.

We ask that both pairs of NGC 6791 and 47 Tuc observations (Visits 01-02, Visits 03-04) are taken within seven days from each other, to sample the CTE at similar epochs.

We have set visit-level timing requirements for visit groups accordingly.

------ Calibration Justification -------

These data will be used to determine the rate of change of the CTE with time, and with position on the detector. Results will be compared to Cycles 17-25 CTE measurements for WFC3/UVIS CCDs, as well as to ACS/CCDs, and where possible to CTE measurements of first and second generation HST instruments.

The analysis of the data will be used to continue calibrating a model of CTE-induced losses in both FLT and DRZ UVIS images, with a precision of better than 1% for stellar photometry and less than 5% for astrometric effects from CTE-induced source centroid shifts.

The backgound levels, set through post-flash in some exposures, will allow to monitor the performance of post-flash to mitigate CTE.

All exposures taken in this program will also be used to test the pixel-based UVIS CTE correction algorithm developed by J. Anderson.

Proposal 15576 - Visit 01 - WFC3 UVIS CTE Monitor (star cluster)

Visit

Proposal 15576, Visit 01 Tue Aug 07 19:05:19 GMT 2018

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 01-JAN-2019 AND 28-FEB-2019

Comments: USE SAME GUIDE STAR THROUGHOUT VISIT.
USE SAME ORIENTATION THROUGHOUT VISIT.

Diagnostics

(Visit 01) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE
(Visit 01) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE
(Visit 01) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE
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(Visit 01) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT
(Exposure 1 (Visit 01)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 2 (Visit 01)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 4 (Visit 01)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 6 (Visit 01)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

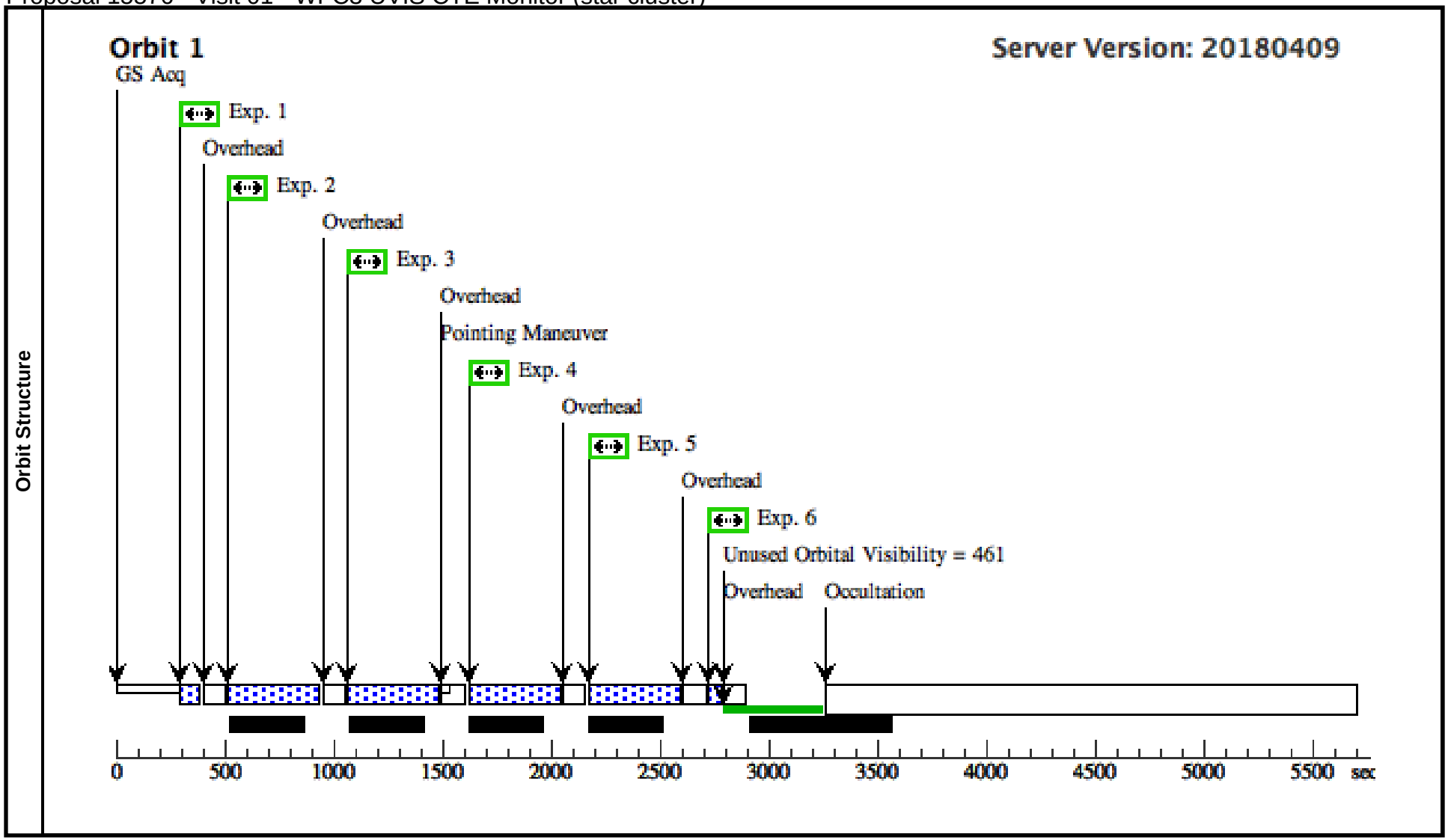
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	NGC-6791	RA: 19 20 53.9500 (290.2247917d) Dec: +37 48 9.60 (37.80267d) Equinox: J2000		V=9.5	Reference Frame: ICRS

Comments:
Category=STELLAR CLUSTER
Description=[OPEN CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO			60 Secs (60 Secs)	
								[==>]	***[1]***
2		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO			420 Secs (420 Secs)	
								[==>]	***[1]***
3		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.			420 Secs (420 Secs)	
								[==>]	***[1]***
4		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO	POS TARG 0,81.6		420 Secs (420 Secs)	
								[==>]	***[1]***
5		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.	POS TARG 0,81.6		420 Secs (420 Secs)	
								[==>]	***[1]***
6		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO	POS TARG 0,81.6		60 Secs (60 Secs)	
								[==>]	***[1]***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Orbit 1
Server Version: 20180409
GS Acq
Exp. 1
Overhead
Exp. 2
Overhead
Exp. 3
Overhead
Pointing Maneuver
Exp. 4
Overhead
Exp. 5
Overhead
Exp. 6
Unused Orbital Visibility = 461
Overhead
Occultation
0
500
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1500
2000
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3000
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Visit

Proposal 15576, Visit 02 Tue Aug 07 19:05:19 GMT 2018

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: GROUP 02,01 WITHIN 7D

Comments: USE SAME GUIDE STAR THROUGHOUT VISIT.
USE SAME ORIENTATION THROUGHOUT VISIT.

Diagnostics

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(Exposure 1 (Visit 02)) 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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(Exposure 19 (Visit 02)) 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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(Exposure 21 (Visit 02)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC-104	RA: 00 22 38.2500 (5.6593750d)		V=4.91	Reference Frame: ICRS
	Alt Name1: 47-TUC	Dec: -72 03 54.00 (-72.06500d)			
		Equinox: J2000			

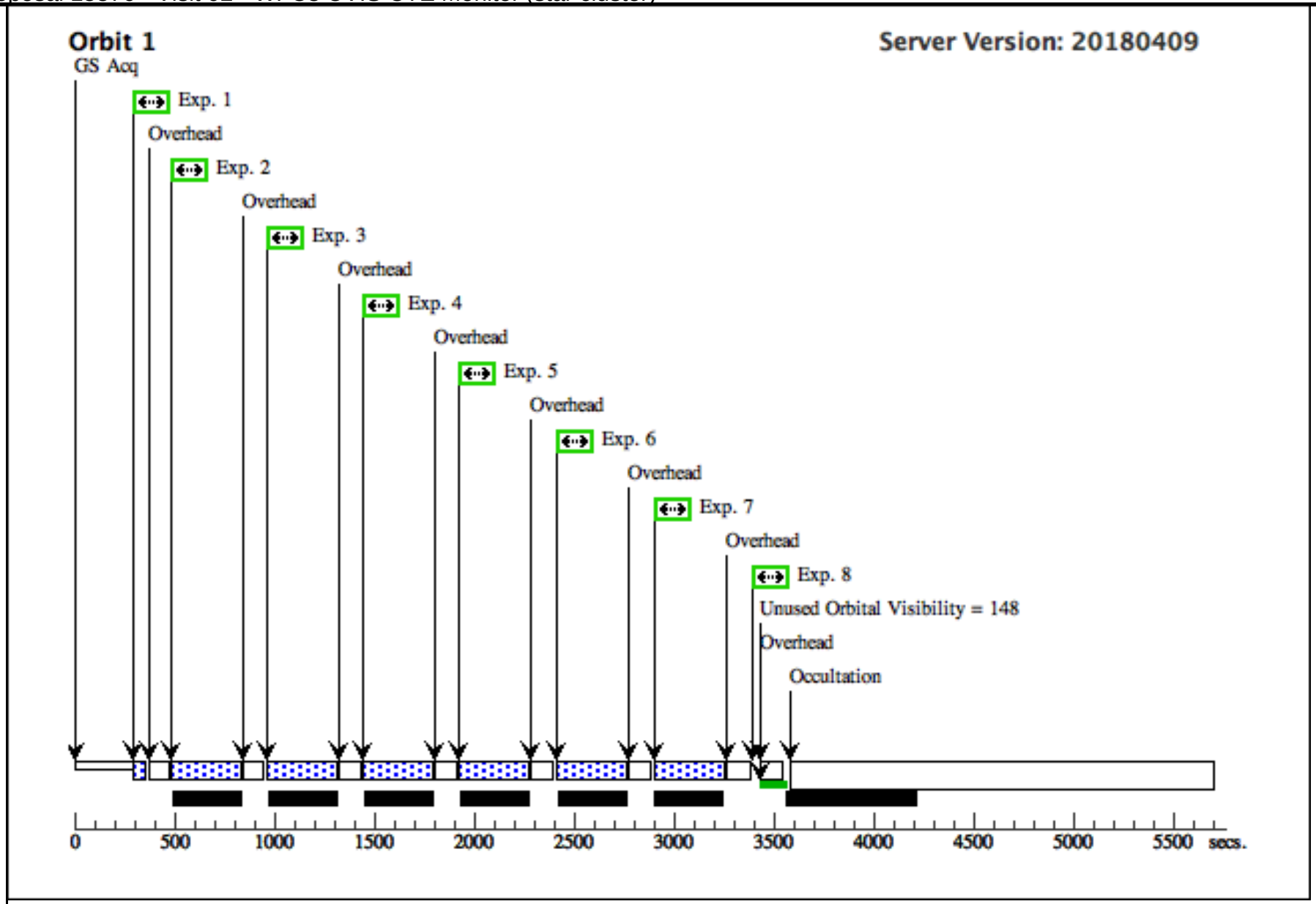
Comments:
Category=STELLAR CLUSTER
Description=[GLOBULAR CLUSTER]

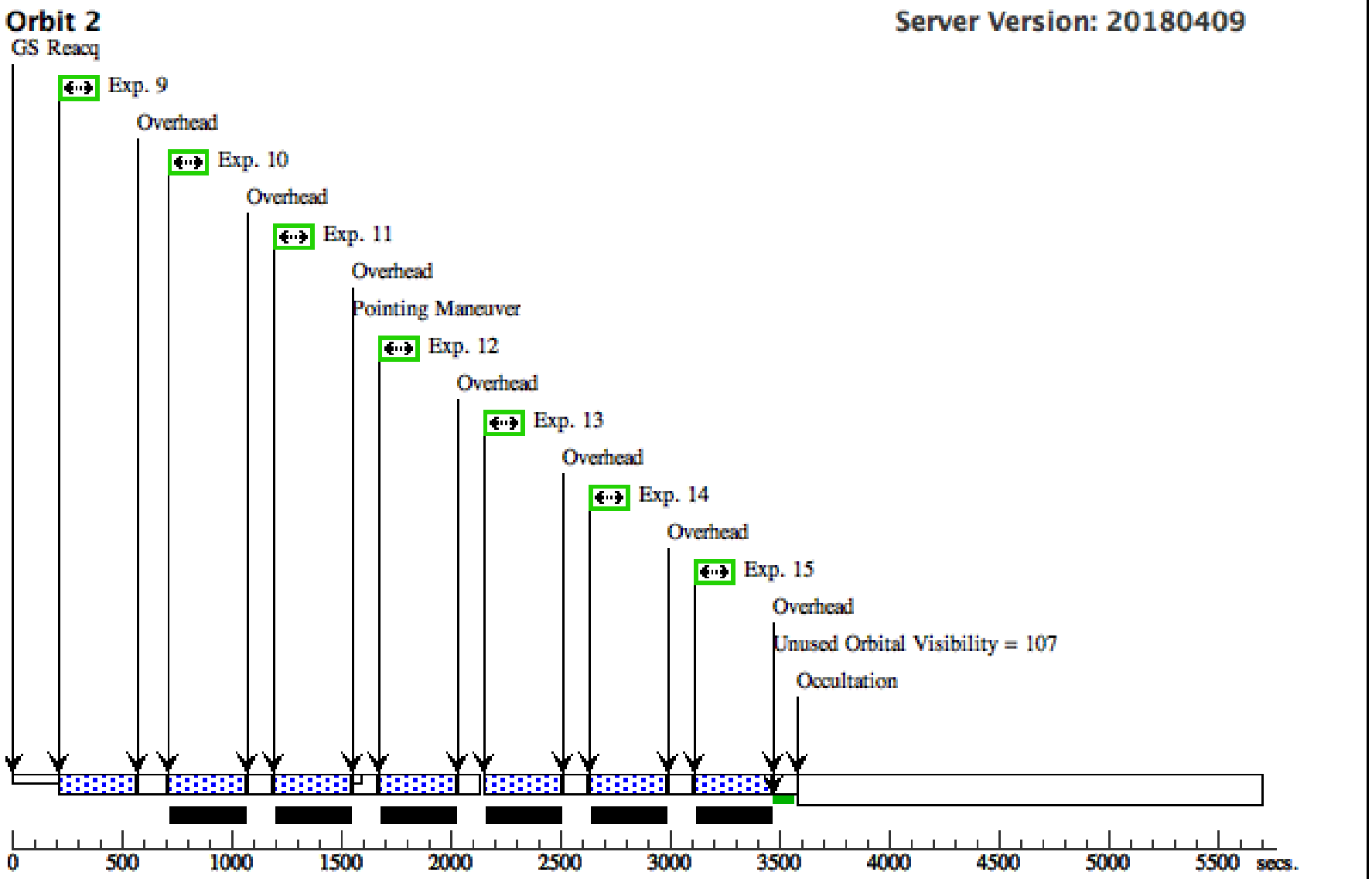
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO			30 Secs (30 Secs)	
								[==>]	***[1]***
2		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO			348 Secs (348 Secs)	
								[==>]	***[1]***
3		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=6.			348 Secs (348 Secs)	
								[==>]	***[1]***
4		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[1]***
5		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=18	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[1]***
6		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=24	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[1]***
7		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=LOW; FLASHEXP=13.	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[1]***
8		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.	POS TARG 0,0		30 Secs (30 Secs)	
								[==>]	***[1]***
9		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=LOW; FLASHEXP=21.5			348 Secs (348 Secs)	
								[==>]	***[2]***
10		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=MEDIUM; FLASHEXP=1.24	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[2]***
11		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=MEDIUM; FLASHEXP=1.59	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[2]***
12		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[2]***
13		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=6.	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[2]***
14		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[2]***
15		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=18	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[2]***
16		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=24	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[3]***
17		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=LOW; FLASHEXP=13.	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[3]***
18		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=LOW; FLASHEXP=21.5	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[3]***

	19	(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=MEDIUM; FLASHEXP=1.24	POS TARG 0,81.6	348 Secs (348 Secs) *[==>]*	 ***[3]***
	20	(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=MEDIUM; FLASHEXP=1.59	POS TARG 0,81.6	348 Secs (348 Secs) *[==>]*	 ***[3]***
	21	(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO	POS TARG 0,81.6	30 Secs (30 Secs) *[==>]*	 ***[3]***
	22	(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.	POS TARG 0,81.6	30 Secs (30 Secs) *[==>]*	 ***[3]***

Orbit Structure

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GS Reacq
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Overhead
Exp. 10
Overhead
Exp. 11
Overhead
Pointing Maneuver
Exp. 12
Overhead
Exp. 13
Overhead
Exp. 14
Overhead
Exp. 15
Overhead
Unused Orbital Visibility = 107
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
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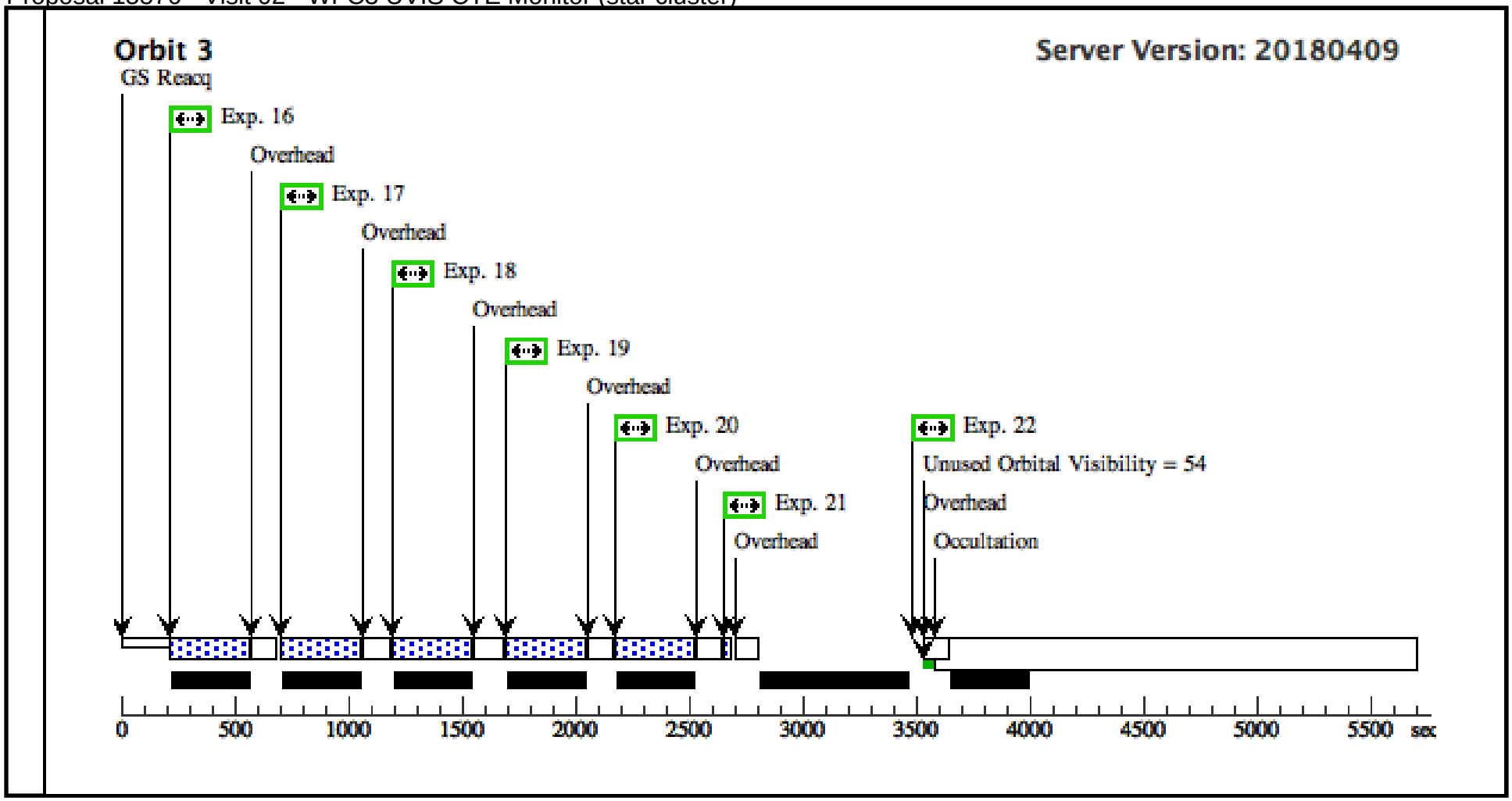
secs.


Orbit 3
Server Version: 20180409
GS Reacq
Exp. 16
Overhead
Exp. 17
Overhead
Exp. 18
Overhead
Exp. 19
Overhead
Exp. 20
Overhead
Exp. 21
Overhead
Exp. 22
Unused Orbital Visibility = 54
Overhead
Occultation
0
500
1000
1500
2000
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3500
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4500
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sec

Visit

Proposal 15576, Visit 03 Tue Aug 07 19:05:20 GMT 2018

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: BETWEEN 01-JUL-2019 AND 31-AUG-2019

Comments: USE SAME GUIDE STAR THROUGHOUT VISIT.
USE SAME ORIENTATION THROUGHOUT VISIT.

Diagnostics

(Visit 03) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE
(Visit 03) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE
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(Visit 03) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE NO ORIENT
(Exposure 1 (Visit 03)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 2 (Visit 03)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 4 (Visit 03)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 6 (Visit 03)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	NGC-6791	RA: 19 20 53.9500 (290.2247917d) Dec: +37 48 9.60 (37.80267d) Equinox: J2000		V=9.5	Reference Frame: ICRS

Comments:
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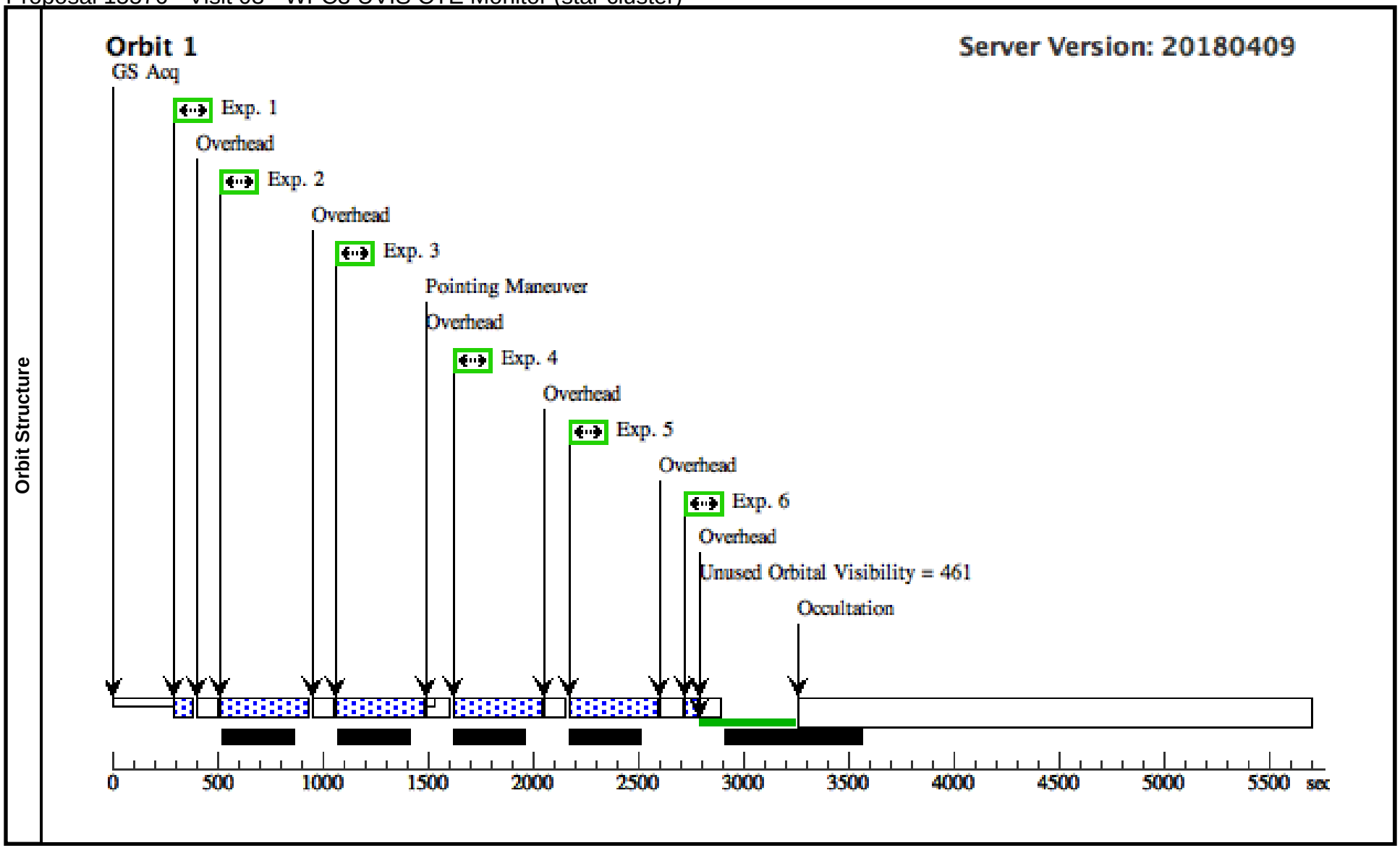
Description=[OPEN CLUSTER]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO			60 Secs (60 Secs)	
								[==>]	***[1]***
2		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO			420 Secs (420 Secs)	
								[==>]	***[1]***
3		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.			420 Secs (420 Secs)	
								[==>]	***[1]***
4		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO	POS TARG 0,81.6		420 Secs (420 Secs)	
								[==>]	***[1]***
5		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.	POS TARG 0,81.6		420 Secs (420 Secs)	
								[==>]	***[1]***
6		(2) NGC-6791	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO	POS TARG 0,81.6		60 Secs (60 Secs)	
								[==>]	***[1]***


Orbit 1
Server Version: 20180409
Orbit Structure
GS Acq
Exp. 1
Overhead
Exp. 2
Overhead
Exp. 3
Pointing Maneuver
Overhead
Exp. 4
Overhead
Exp. 5
Overhead
Exp. 6
Overhead
Unused Orbital Visibility = 461
Occultation
0
500
1000
1500
2000
2500
3000
3500
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Visit

Proposal 15576, Visit 04 Tue Aug 07 19:05:20 GMT 2018

Diagnostic Status: Warning

Scientific Instruments: WFC3/UVIS

Special Requirements: GROUP 04,03 WITHIN 7D

Comments: USE SAME GUIDE STAR THROUGHOUT VISIT.
USE SAME ORIENTATION THROUGHOUT VISIT.

Diagnostics

(Visit 04) Warning (Orbit Planner): POS TARG OUTSIDE OF APERTURE
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(Exposure 1 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 2 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 3 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 5 (Visit 04)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser
(Exposure 6 (Visit 04)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser
(Exposure 7 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 9 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 10 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 11 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 12 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 13 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 15 (Visit 04)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser
(Exposure 16 (Visit 04)) Warning (Form): FLASH level may be too high for this exposure or a long subexposure. See extended explanation in the diagnostic browser
(Exposure 17 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 18 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 19 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 20 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser
(Exposure 21 (Visit 04)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC-104	RA: 00 22 38.2500 (5.6593750d)		V=4.91	Reference Frame: ICRS
	Alt Name1: 47-TUC	Dec: -72 03 54.00 (-72.06500d)			
		Equinox: J2000			

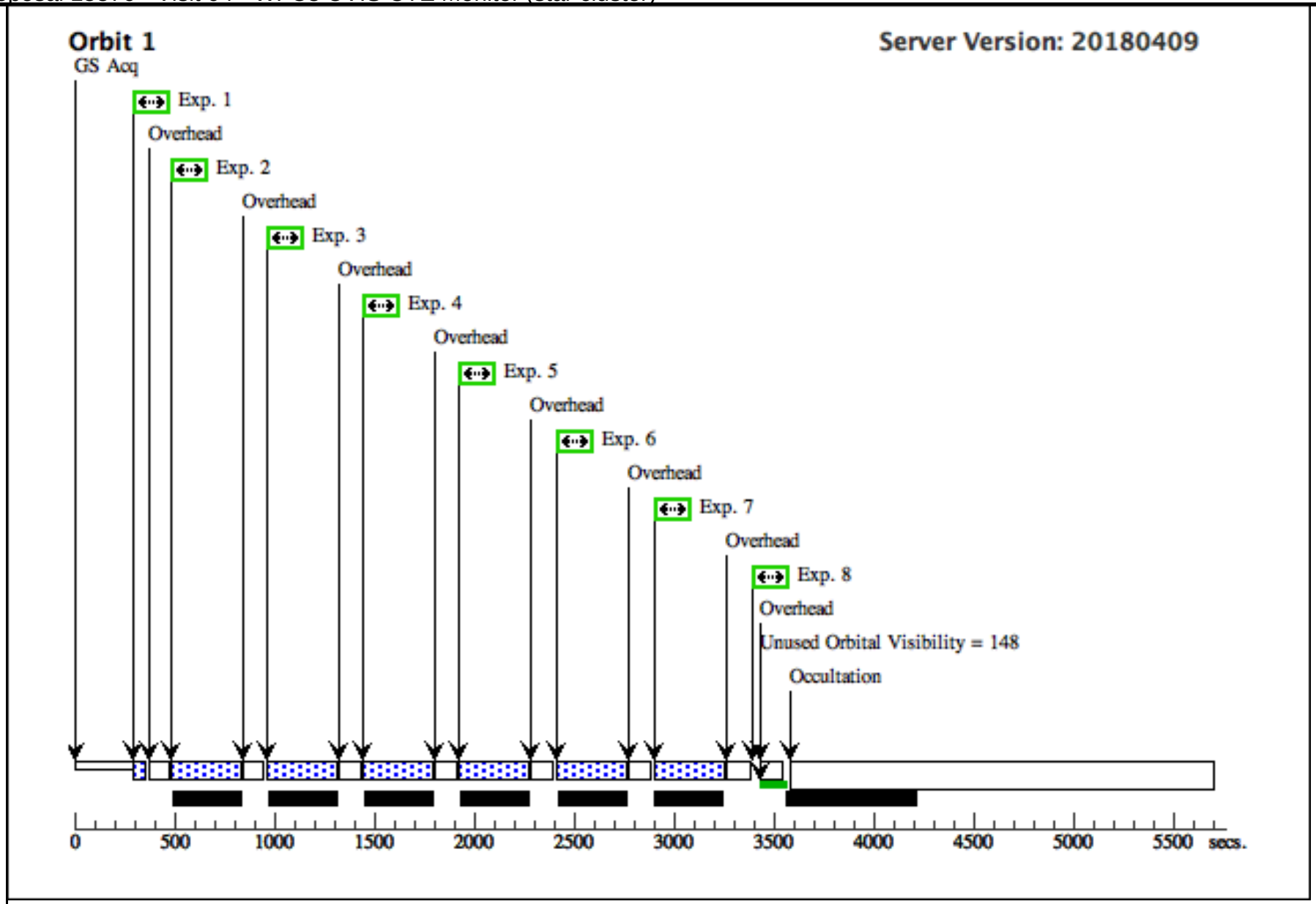
Comments:
Category=STELLAR CLUSTER
Description=[GLOBULAR CLUSTER]

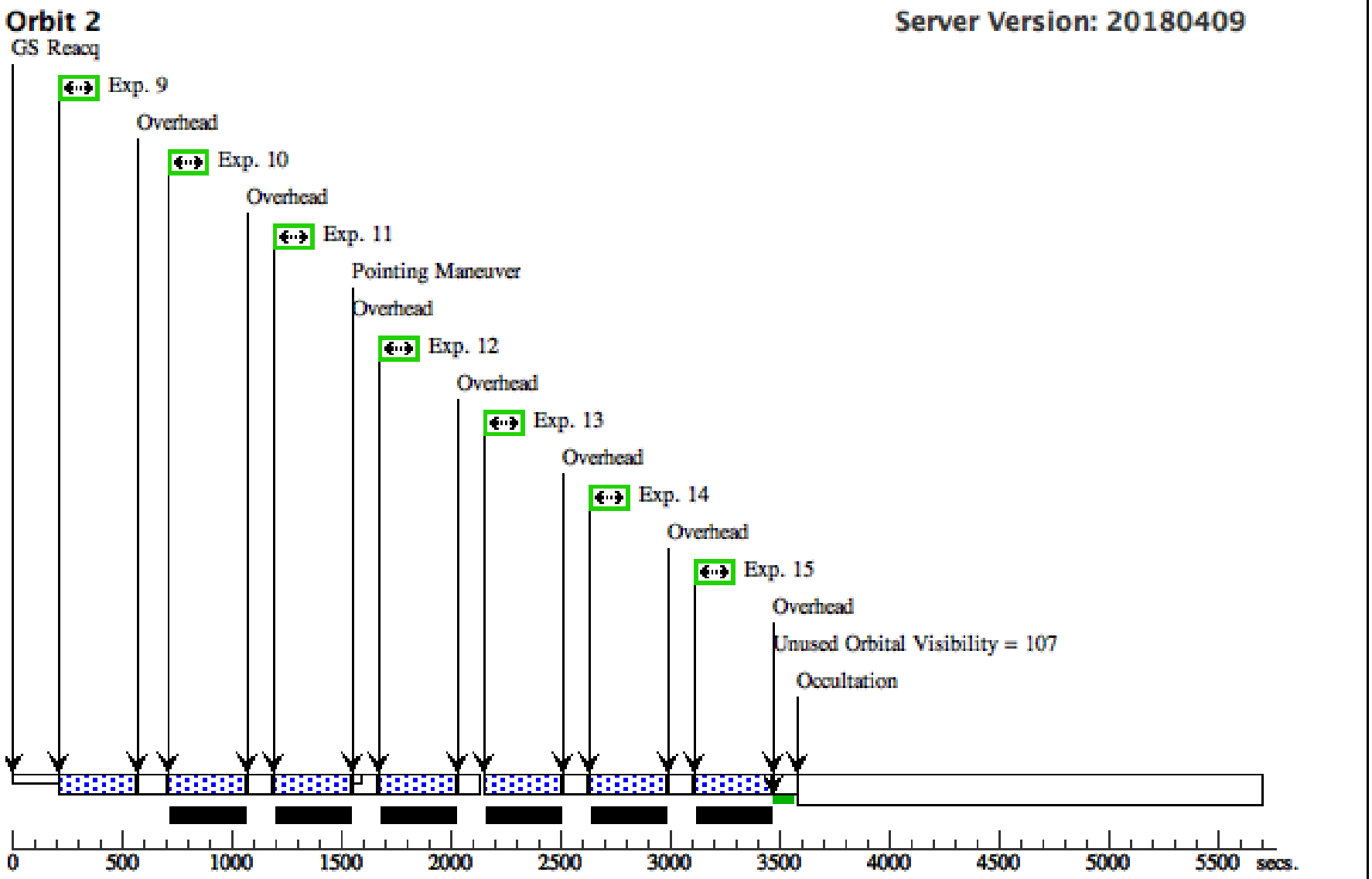
Exposures

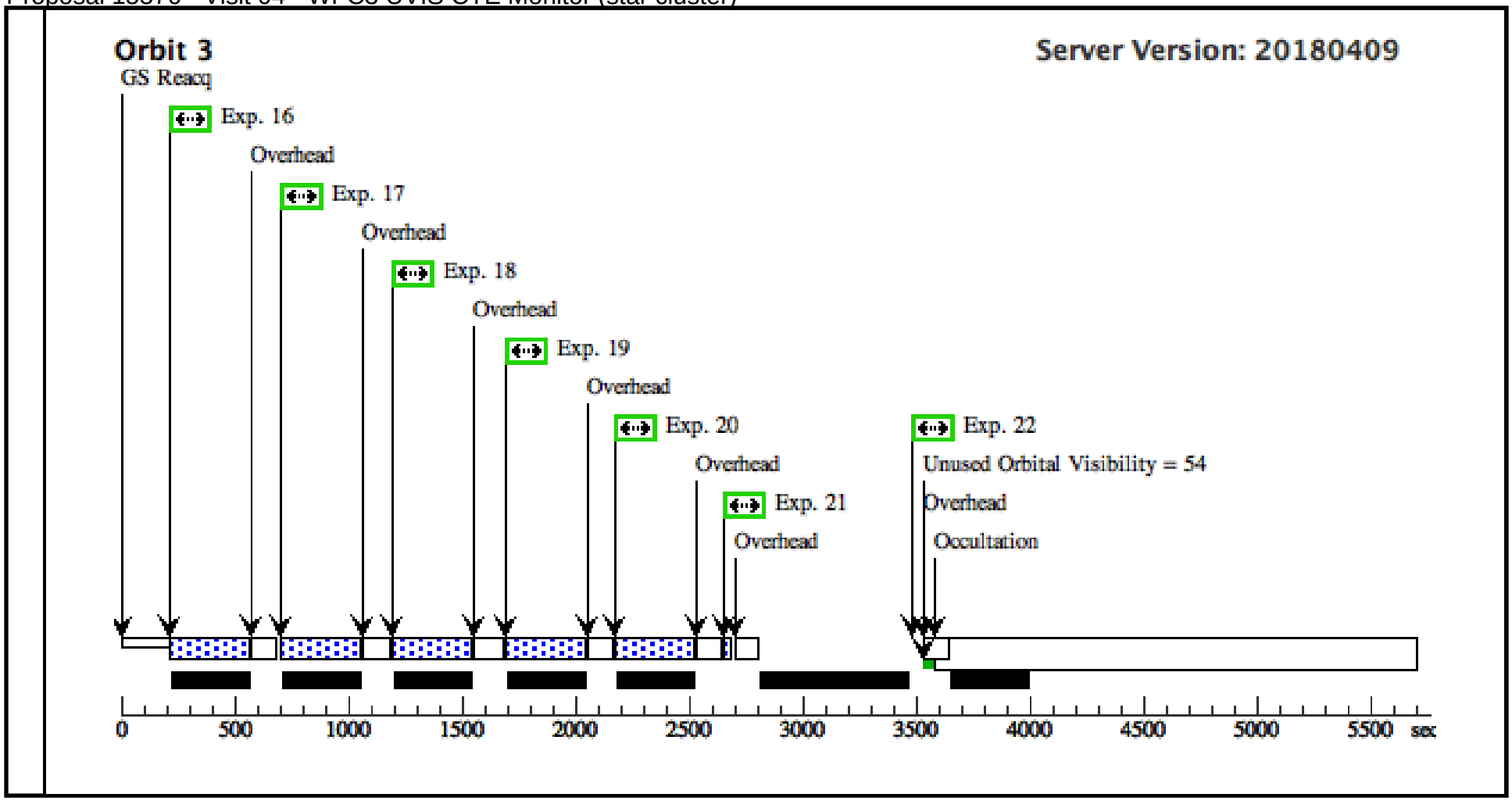
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO			30 Secs (30 Secs)	
								[==>]	***[1]***
2		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO			348 Secs (348 Secs)	
								[==>]	***[1]***
3		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=6.			348 Secs (348 Secs)	
								[==>]	***[1]***
4		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[1]***
5		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=18	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[1]***
6		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=24	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[1]***
7		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=LOW; FLASHEXP=13.	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[1]***
8		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.	POS TARG 0,0		30 Secs (30 Secs)	
								[==>]	***[1]***
9		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=LOW; FLASHEXP=21.5			348 Secs (348 Secs)	
								[==>]	***[2]***
10		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=MEDIUM; FLASHEXP=1.24	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[2]***
11		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=MEDIUM; FLASHEXP=1.59	POS TARG 0,0		348 Secs (348 Secs)	
								[==>]	***[2]***
12		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[2]***
13		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=6.	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[2]***
14		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[2]***
15		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=18	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[2]***
16		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=24	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[3]***
17		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=LOW; FLASHEXP=13.	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[3]***
18		(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=LOW; FLASHEXP=21.5	POS TARG 0,81.6		348 Secs (348 Secs)	
								[==>]	***[3]***

	19	(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=MEDIUM; FLASHEXP=1.24	POS TARG 0,81.6	348 Secs (348 Secs) *[==>]*	 ***[3]***
	20	(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASHCUR=MEDIUM; FLASHEXP=1.59	POS TARG 0,81.6	348 Secs (348 Secs) *[==>]*	 ***[3]***
	21	(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO	POS TARG 0,81.6	30 Secs (30 Secs) *[==>]*	 ***[3]***
	22	(1) NGC-104	WFC3/UVIS, ACCUM, UVIS	F502N	CR-SPLIT=NO; FLASH=12.	POS TARG 0,81.6	30 Secs (30 Secs) *[==>]*	 ***[3]***

Orbit Structure




Orbit 2
Server Version: 20180409
GS Reacq
Exp. 9
Overhead
Exp. 10
Overhead
Exp. 11
Pointing Maneuver
Overhead
Exp. 12
Overhead
Exp. 13
Overhead
Exp. 14
Overhead
Exp. 15
Overhead
Unused Orbital Visibility = 107
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.


Orbit 3
Server Version: 20180409
GS Reacq
Exp. 16
Overhead
Exp. 17
Overhead
Exp. 18
Overhead
Exp. 19
Overhead
Exp. 20
Overhead
Exp. 21
Overhead
Exp. 22
Unused Orbital Visibility = 54
Overhead
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec