15107 - The Cluster Population of UGC 2885

Cycle: 25, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
05	(1) UGC-2885 (2) UGC-2885-V05	ACS/WFC WFC3/UVIS	3	08-Sep-2017 19:02:30.0	yes
06	(1) UGC-2885 (3) UGC-2885-V06	ACS/WFC WFC3/UVIS	3	08-Sep-2017 19:02:33.0	yes
07	(1) UGC-2885 (4) UGC-2885-V07	ACS/WFC WFC3/UVIS	3	08-Sep-2017 19:02:36.0	yes
08	(1) UGC-2885 (5) UGC-2885-V08	ACS/WFC WFC3/UVIS	3	08-Sep-2017 19:02:39.0	yes

12 Total Orbits Used

ABSTRACT

UGC 2885 was discoverd to be the most extended disk galaxy [250 kpc diameter] by Vera Rubin in the 1980's. We ask for HST observations of UGC 2885 as it is close enough to resolve the GC population with HST but it is a substantially more extended disk than any studied before. LCDM galaxy assembly implies that the GC population comes from small accreted systems and the disk --and the clusters associated with it-- predominantly from gas accretion (matching angular momentum to the disk). Several scaling relations between the GC population and parent galaxy have been observed but these differ for disk and spheroidal (massive) galaxies.

We propose to observe this galaxy with HST in 4 point WFC3 mosaic with coordinated ACS parallels to probe both the disk and outer halo component of the GC population. GC populations have been studied extensively using HST color mosaics of local disk galaxies and these can serve as comparison samples. How UGC 2885 cluster populations relate to its stellar and halo mass, luminosity and with radius will reveal the formation history of extra-ordinary disk.

Our goals are twofold: our science goal is to map the luminosity, (some) size, and color distributions of the stellar and globular clusters in and around this disk. In absolute terms, we expect to find many GC but the relative relation of the GC population to this galaxy's mass (stellar and halo) and size will shed light on its formation history; similar to a group or cluster central elliptical or to a field galaxy (albeit one with a disk 10x the Milky Way's size)? Our secondary motive is to make an HST tribute image to the late Vera Rubin.

OBSERVING DESCRIPTION

The proposed observations are a straightforward three-filter 4-point mosaic of UGC 2885, oriented along its major/minor axes. We ask for the F814W, F606W and F475W filters to follow closely the database of previous studies on nearby low-inclination disk galaxies (e.g., Chandar et al., 2010, 2015; Hudson et al., 2014).

WFC3 Mosaic

We ask for a 2 x 2 mosaic using WFC3, dithered between exposures and oriented such that the ACS parallels are located at larger galactocentric radii.

ACS parallels
We ask for ACS parallels with the same filter set as the main WFC fields to
sample the halo cluster populations outside the immediate disk.

We ask for 180deg different orientation to position the ACS parallels on opposite
sides of the s

Exposure times

In a single orbit (40 min), a a signal-to-noise of ~5 is reached for 28.5
mag point sources in F606W. At the distance modulus to UGC 2885 (m - M = 34.49 mag),
this is sufficient to reach the turnover luminosity of the GC luminosity function.

Filter choices

Our choice of filters is based on experience with many other studies with HST
on nearby galaxies (Chandar et al., 2004, 2016; Barmby et al., 2006; Spitler et al., 2006; Harris
et al., 2009) and we opt for the same filters for consistency and to map the stellar populations in
these clusters. These filters cover the peak of the globular cluster SED; having
two colors improves discrimination between star clusters and background galaxies.

Dither Strategy

The WFC3-UVIS-MOSAIC-LINE approach is the most appropriate as the full UVIS channel of WEFC3 is to be used for the mosaic
and the ACS data.

offsets are defined as:
(0, 0) and (36.5, 71.5) pixels.

assuming a Pixel Size: 0.04 arcsec

1.46, 2.86" dither.

We assumed 2 dither positions is sufficient for cosmic ray rejection and chip gap masking.

Mosaic & Parallel Strategy

The mosaic was broken up in individual visits because it was imperative to place the ACS parallels on either side of the mosaic. The single orbit is sufficient to reach the turnover of the GC luminosty function and a greater area covered would be beneficial in the total GC population covered.

Visit

Proposal 15107, Tile Visit 05, implementation Fri Sep 08 23:02:40 GMT 2017

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: ORIENT 270D TO 270 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1-2), (3-4), (5-6)

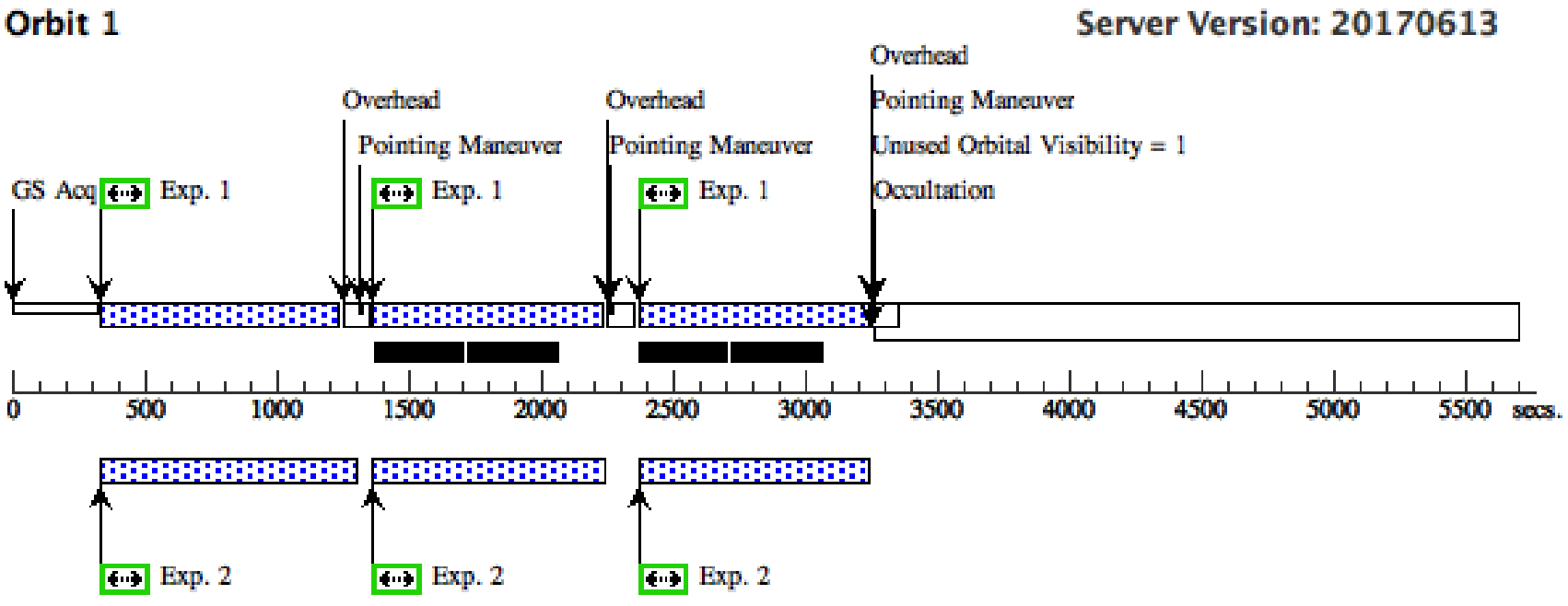
Fixed Targets

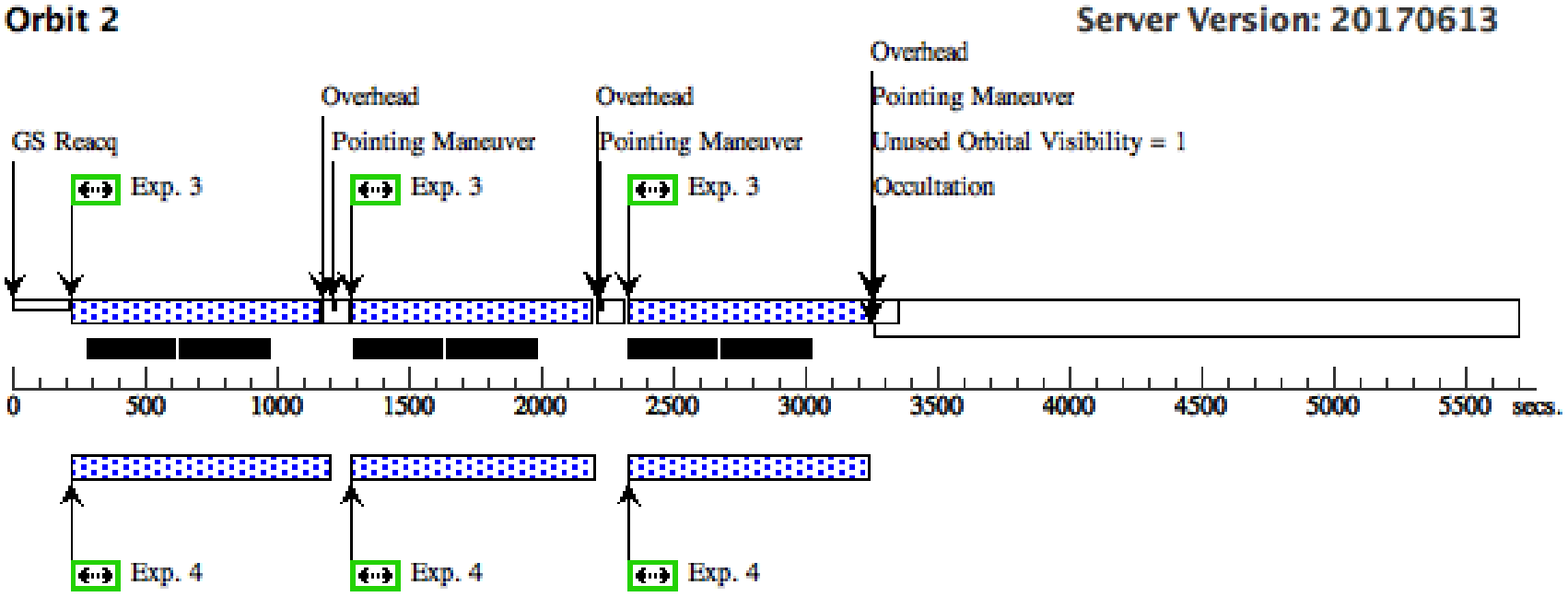
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	UGC-2885	RA: 03 53 2.4400 (58.2601667d) Dec: +35 35 22.10 (35.58947d) Equinox: J2000		V=14.4+/-0.4	Reference Frame: SIMBAD
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					
(2)	UGC-2885-V05	RA: 03 53 13.2800 (58.3053333d) Dec: +35 35 7.57 (35.58544d) Equinox: J2000		V=14.4+/-0.4	Reference Frame: SIMBAD
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					

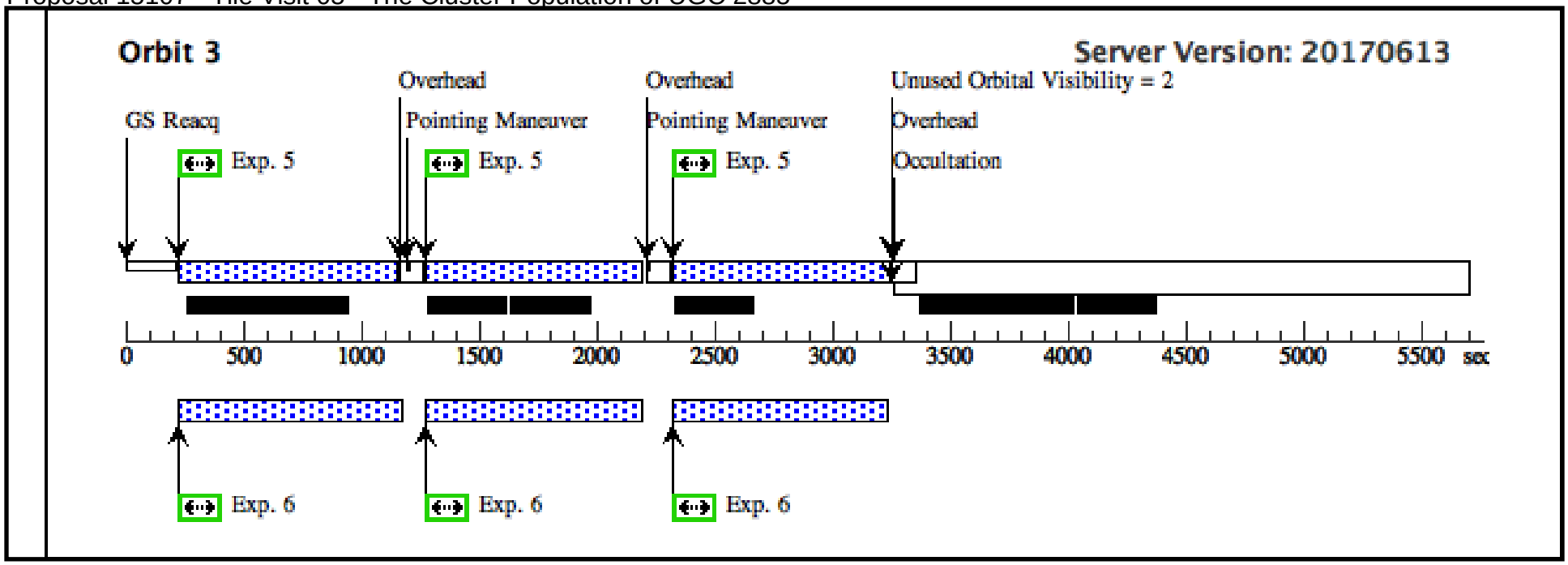
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) UGC-2885-V05	WFC3/UVIS, ACCUM, UVIS	F814W		POS TARG 0.0,0.0	Pattern 2, Exps 1-2 in Tile Visit 05 (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Tile Visit 05	1350 Secs (2625 Secs) *[==>875.0 Secs (Pattern 1)]* *[==>875.0 Secs (Pattern 2)]* *[==>875.0 Secs (Pattern 3)]*	***[1]***
2		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F814W			Pattern 2, Exps 1-2 in Tile Visit 05 (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Tile Visit 05	1250 Secs (2270 Secs) *[==>760.0 Secs (Pattern 1)]* *[==>760.0 Secs (Pattern 2)]* *[==>750.0 Secs (Pattern 3)]*	***[1]***
3		(2) UGC-2885-V05	WFC3/UVIS, ACCUM, UVIS	F606W		POS TARG 0.0,0.0	Pattern 2, Exps 3-4 in Tile Visit 05 (2) Prime + Parallel Group 3-4 in Pattern 2, Exps 3-4 in Tile Visit 05	1350 Secs (2745 Secs) *[==>915.0 Secs (Pattern 1)]* *[==>915.0 Secs (Pattern 2)]* *[==>915.0 Secs (Pattern 3)]*	***[2]***
4		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F606W			Pattern 2, Exps 3-4 in Tile Visit 05 (2) Prime + Parallel Group 3-4 in Pattern 2, Exps 3-4 in Tile Visit 05	1250 Secs (2390 Secs) *[==>800.0 Secs (Pattern 1)]* *[==>800.0 Secs (Pattern 2)]* *[==>790.0 Secs (Pattern 3)]*	***[2]***
5		(2) UGC-2885-V05	WFC3/UVIS, ACCUM, UVIS	F475W		POS TARG 0.0,0.0	Pattern 2, Exps 5-6 in Tile Visit 05 (2) Prime + Parallel Group 5-6 in Pattern 2, Exps 5-6 in Tile Visit 05	1350 Secs (2760 Secs) *[==>920.0 Secs (Pattern 1)]* *[==>920.0 Secs (Pattern 2)]* *[==>920.0 Secs (Pattern 3)]*	***[3]***
6		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F475W			Pattern 2, Exps 5-6 in Tile Visit 05 (2) Prime + Parallel Group 5-6 in Pattern 2, Exps 5-6 in Tile Visit 05	1250 Secs (2390 Secs) *[==>800.0 Secs (Pattern 1)]* *[==>800.0 Secs (Pattern 2)]* *[==>790.0 Secs (Pattern 3)]*	***[3]***

Orbit Structure






Orbit 3
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Pointing Maneuver
Overhead
Pointing Maneuver
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Occultation
Exp. 5
Exp. 5
Exp. 5
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500
1000
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2500
3000
3500
4000
4500
5000
5500
sec
Exp. 6
Exp. 6
Exp. 6

Visit

Proposal 15107, Tile Visit 06, implementation Fri Sep 08 23:02:41 GMT 2017

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 05

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1-2), (3-4), (5-6)

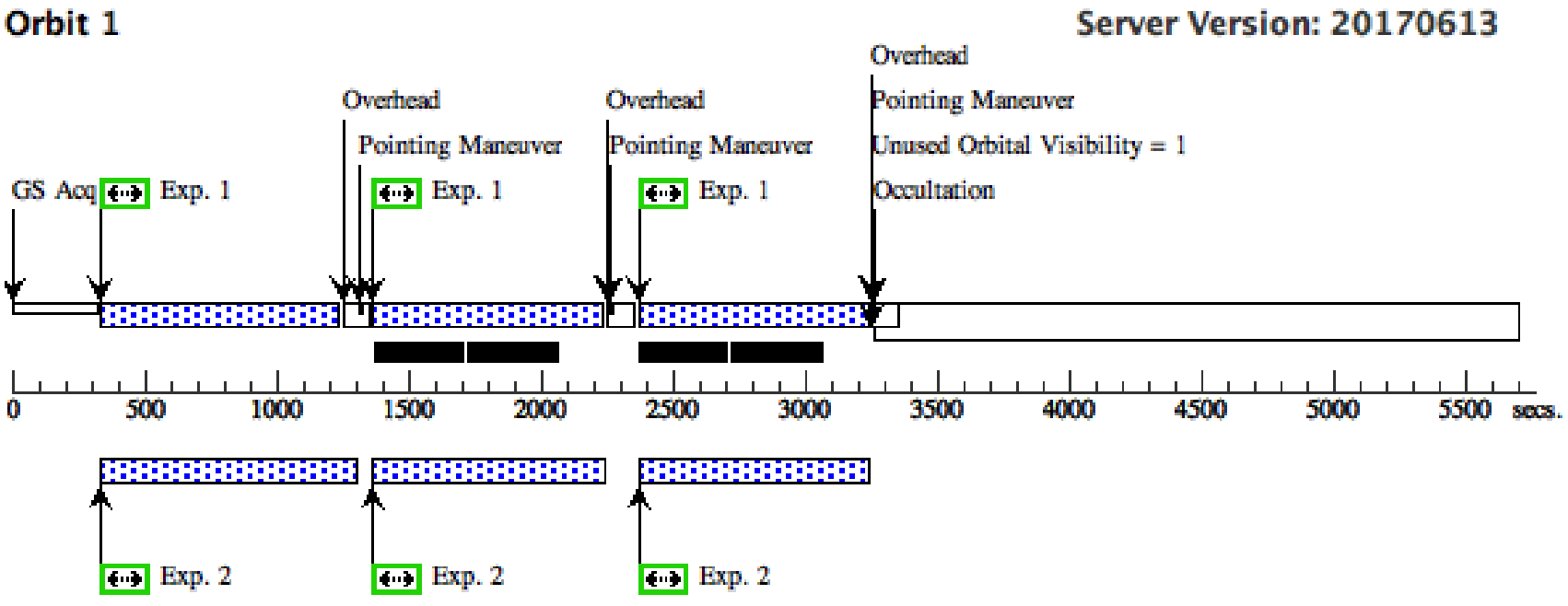
Fixed Targets

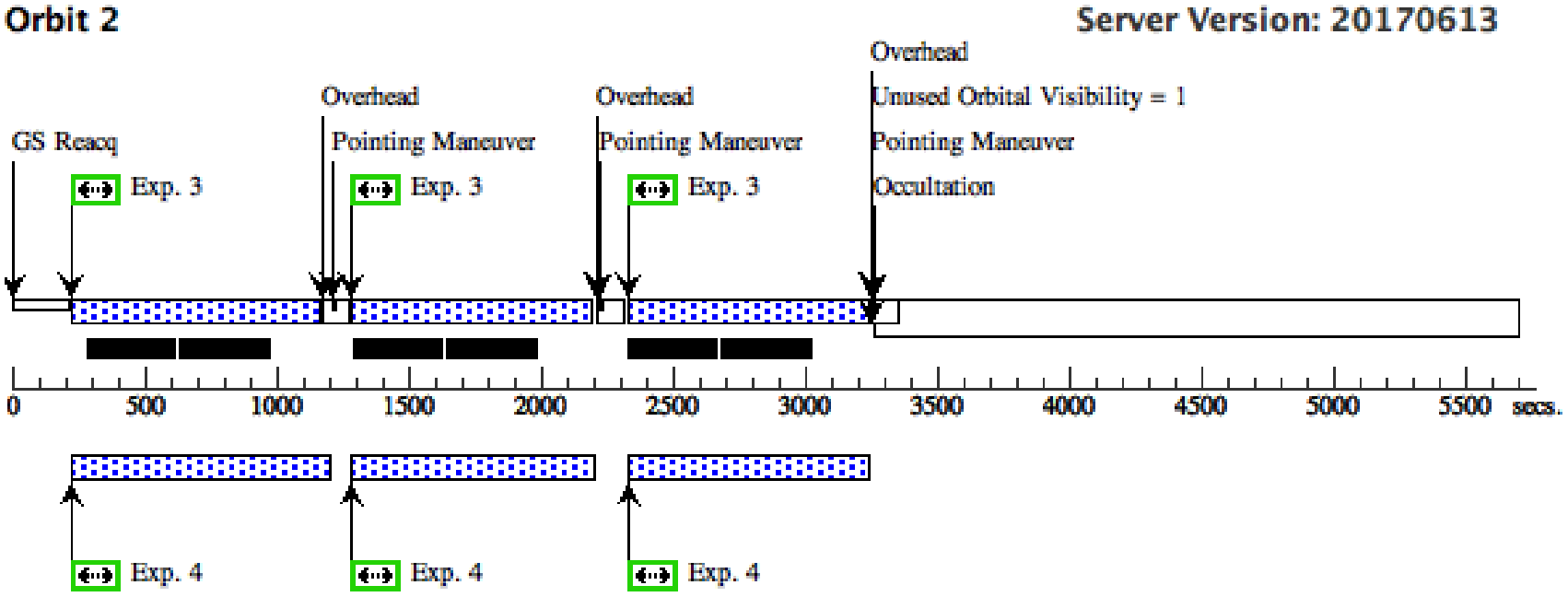
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	UGC-2885	RA: 03 53 2.4400 (58.2601667d) Dec: +35 35 22.10 (35.58947d) Equinox: J2000		V=14.4+/-0.4	Reference Frame: SIMBAD
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					
(3)	UGC-2885-V06	RA: 03 53 3.9275 (58.2663646d) Dec: +35 33 27.20 (35.55756d) Equinox: J2000		V=14.4+/-0.4	Reference Frame: SIMBAD
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					

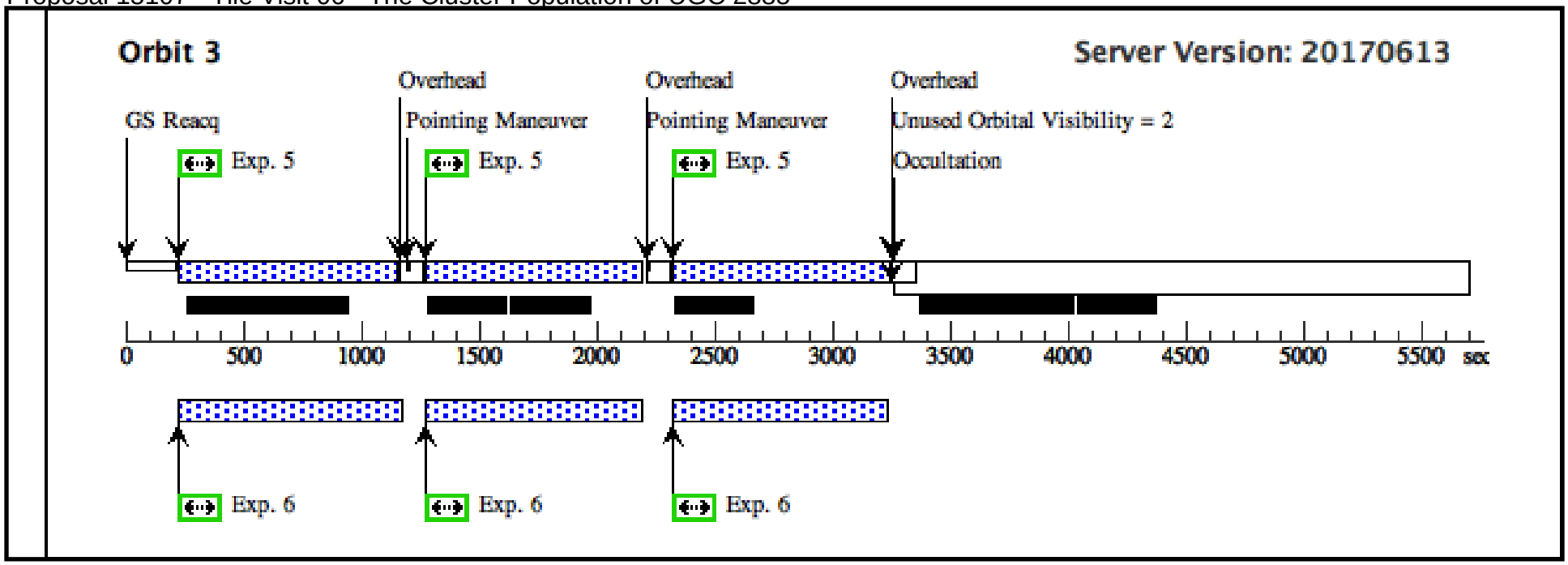
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) UGC-2885-V06	WFC3/UVIS, ACCUM, UVIS	F814W		POS TARG 0.0,0.0	Pattern 2, Exps 1-2 in Tile Visit 06 (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Tile Visit 06	1350 Secs (2625 Secs) *[==>875.0 Secs (Pattern 1)]* *[==>875.0 Secs (Pattern 2)]* *[==>875.0 Secs (Pattern 3)]*	***[1]***
2		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F814W			Pattern 2, Exps 1-2 in Tile Visit 06 (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Tile Visit 06	1250 Secs (2270 Secs) *[==>760.0 Secs (Pattern 1)]* *[==>760.0 Secs (Pattern 2)]* *[==>750.0 Secs (Pattern 3)]*	***[1]***
3		(3) UGC-2885-V06	WFC3/UVIS, ACCUM, UVIS	F606W		POS TARG 0.0,0.0	Pattern 2, Exps 3-4 in Tile Visit 06 (2) Prime + Parallel Group 3-4 in Pattern 2, Exps 3-4 in Tile Visit 06	1350 Secs (2745 Secs) *[==>915.0 Secs (Pattern 1)]* *[==>915.0 Secs (Pattern 2)]* *[==>915.0 Secs (Pattern 3)]*	***[2]***
4		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F606W			Pattern 2, Exps 3-4 in Tile Visit 06 (2) Prime + Parallel Group 3-4 in Pattern 2, Exps 3-4 in Tile Visit 06	1250 Secs (2390 Secs) *[==>800.0 Secs (Pattern 1)]* *[==>800.0 Secs (Pattern 2)]* *[==>790.0 Secs (Pattern 3)]*	***[2]***
5		(3) UGC-2885-V06	WFC3/UVIS, ACCUM, UVIS	F475W		POS TARG 0.0,0.0	Pattern 2, Exps 5-6 in Tile Visit 06 (2) Prime + Parallel Group 5-6 in Pattern 2, Exps 5-6 in Tile Visit 06	1350 Secs (2760 Secs) *[==>920.0 Secs (Pattern 1)]* *[==>920.0 Secs (Pattern 2)]* *[==>920.0 Secs (Pattern 3)]*	***[3]***
6		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F475W			Pattern 2, Exps 5-6 in Tile Visit 06 (2) Prime + Parallel Group 5-6 in Pattern 2, Exps 5-6 in Tile Visit 06	1250 Secs (2390 Secs) *[==>800.0 Secs (Pattern 1)]* *[==>800.0 Secs (Pattern 2)]* *[==>790.0 Secs (Pattern 3)]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20170613
GS Reacq
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Unused Orbital Visibility = 2
Occultation
Exp. 5
Exp. 5
Exp. 5
Exp. 6
Exp. 6
Exp. 6
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500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 15107, Tile Visit 07, implementation Fri Sep 08 23:02:41 GMT 2017

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: ORIENT 90D TO 90 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1-2), (3-4), (5-6)

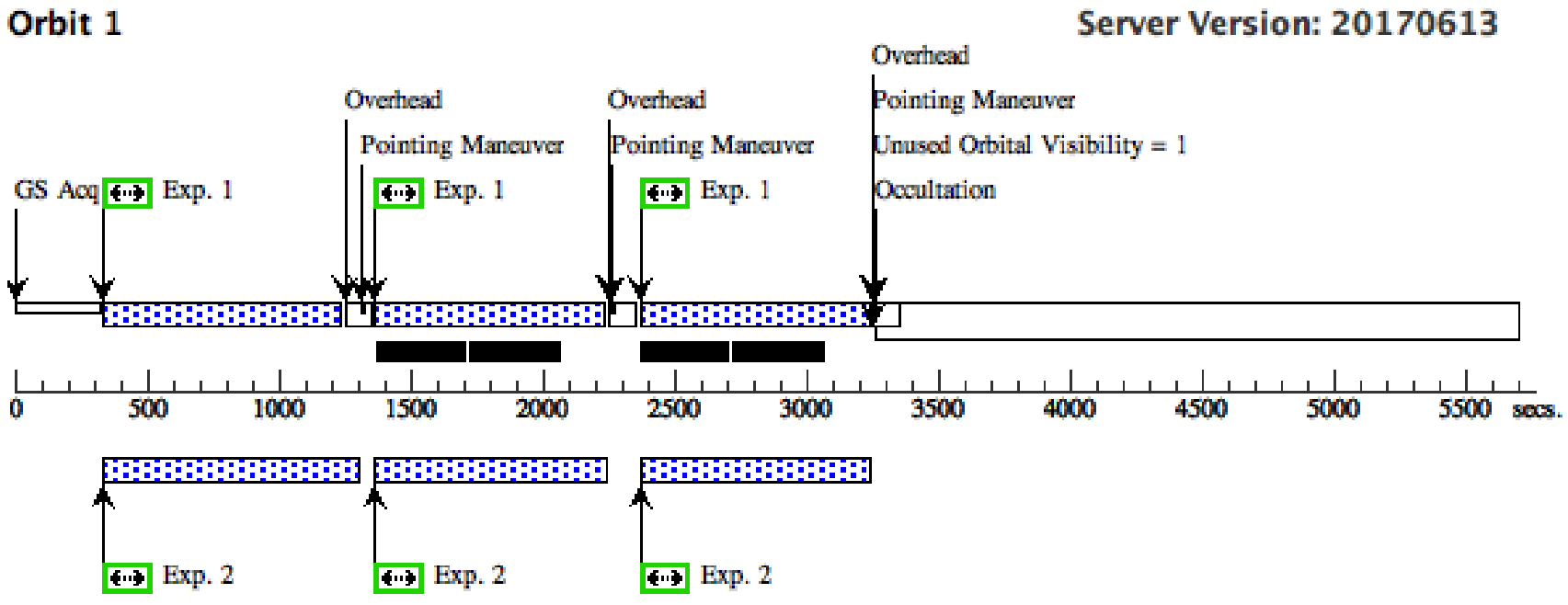
Fixed Targets

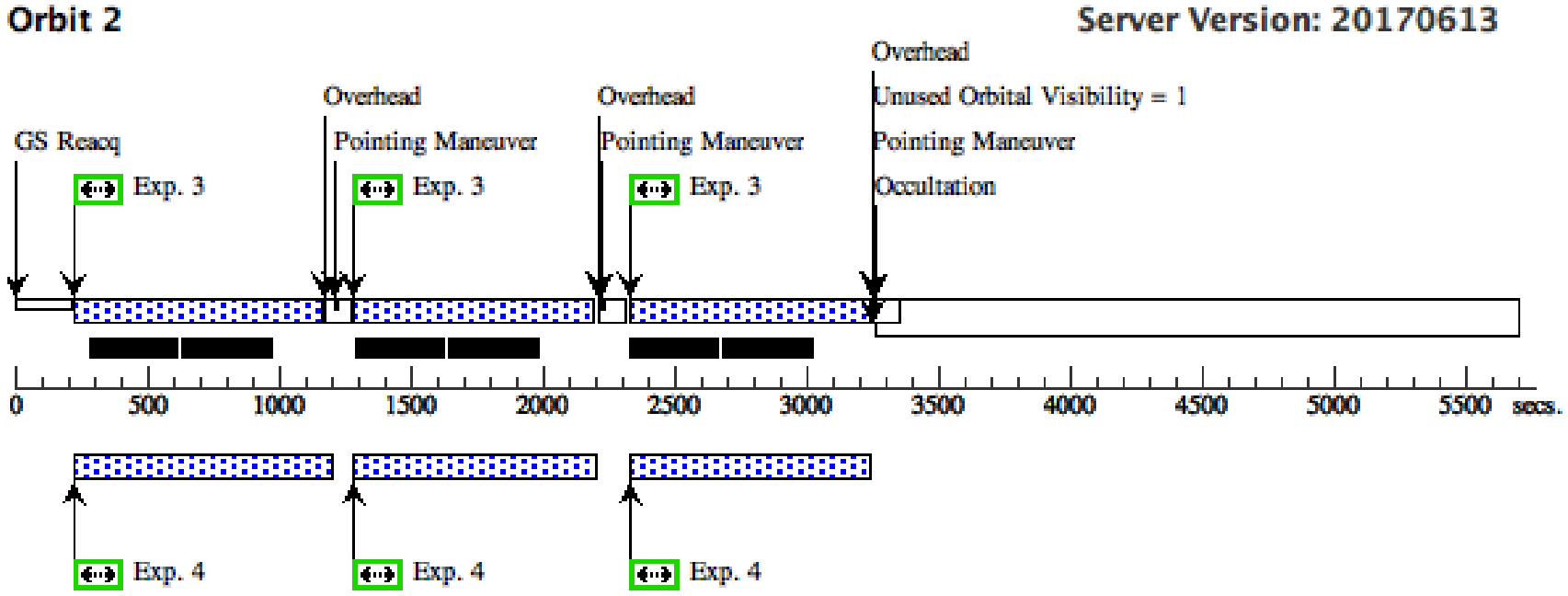
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	UGC-2885	RA: 03 53 2.4400 (58.2601667d) Dec: +35 35 22.10 (35.58947d) Equinox: J2000		V=14.4+/-0.4	Reference Frame: SIMBAD
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					
(4)	UGC-2885-V07	RA: 03 53 2.6893 (58.2612054d) Dec: +35 37 17.56 (35.62154d) Equinox: J2000		V=14.4+/-0.4	Reference Frame: SIMBAD
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					

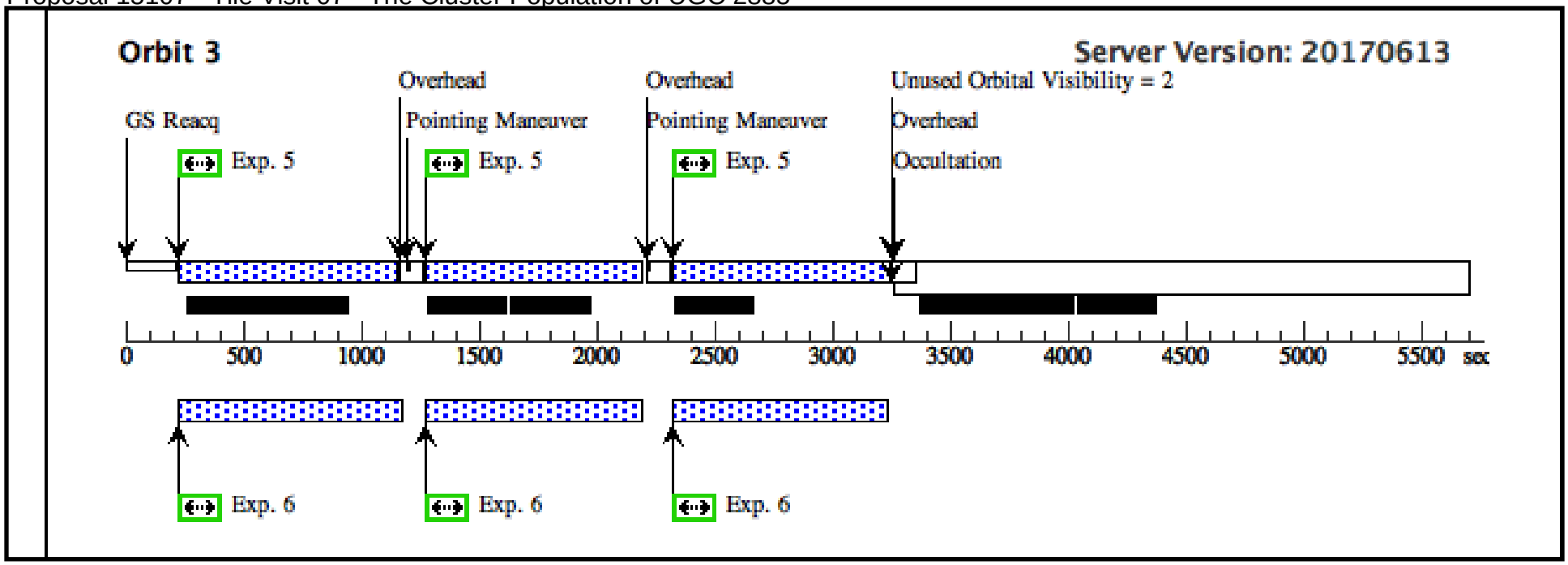
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) UGC-2885-V07	WFC3/UVIS, ACCUM, UVIS	F814W		POS TARG 0.0,0.0	Pattern 2, Exps 1-2 in Tile Visit 07 (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Tile Visit 07	1350 Secs (2625 Secs) *[==>875.0 Secs (Pattern 1)]* *[==>875.0 Secs (Pattern 2)]* *[==>875.0 Secs (Pattern 3)]*	***[1]***
2		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F814W			Pattern 2, Exps 1-2 in Tile Visit 07 (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Tile Visit 07	1250 Secs (2270 Secs) *[==>760.0 Secs (Pattern 1)]* *[==>760.0 Secs (Pattern 2)]* *[==>750.0 Secs (Pattern 3)]*	***[1]***
3		(4) UGC-2885-V07	WFC3/UVIS, ACCUM, UVIS	F606W		POS TARG 0.0,0.0	Pattern 2, Exps 3-4 in Tile Visit 07 (2) Prime + Parallel Group 3-4 in Pattern 2, Exps 3-4 in Tile Visit 07	1350 Secs (2745 Secs) *[==>915.0 Secs (Pattern 1)]* *[==>915.0 Secs (Pattern 2)]* *[==>915.0 Secs (Pattern 3)]*	***[2]***
4		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F606W			Pattern 2, Exps 3-4 in Tile Visit 07 (2) Prime + Parallel Group 3-4 in Pattern 2, Exps 3-4 in Tile Visit 07	1250 Secs (2390 Secs) *[==>800.0 Secs (Pattern 1)]* *[==>800.0 Secs (Pattern 2)]* *[==>790.0 Secs (Pattern 3)]*	***[2]***
5		(4) UGC-2885-V07	WFC3/UVIS, ACCUM, UVIS	F475W		POS TARG 0.0,0.0	Pattern 2, Exps 5-6 in Tile Visit 07 (2) Prime + Parallel Group 5-6 in Pattern 2, Exps 5-6 in Tile Visit 07	1350 Secs (2760 Secs) *[==>920.0 Secs (Pattern 1)]* *[==>920.0 Secs (Pattern 2)]* *[==>920.0 Secs (Pattern 3)]*	***[3]***
6		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F475W			Pattern 2, Exps 5-6 in Tile Visit 07 (2) Prime + Parallel Group 5-6 in Pattern 2, Exps 5-6 in Tile Visit 07	1250 Secs (2390 Secs) *[==>800.0 Secs (Pattern 1)]* *[==>800.0 Secs (Pattern 2)]* *[==>790.0 Secs (Pattern 3)]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20170613
GS Reacq
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Unused Orbital Visibility = 2
Overhead
Occultation
Exp. 5
Exp. 5
Exp. 5
0
500
1000
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4500
5000
5500
sec
Exp. 6
Exp. 6
Exp. 6

Visit

Proposal 15107, Tile Visit 08, implementation Fri Sep 08 23:02:41 GMT 2017

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS, ACS/WFC

Special Requirements: SAME ORIENT AS 07

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
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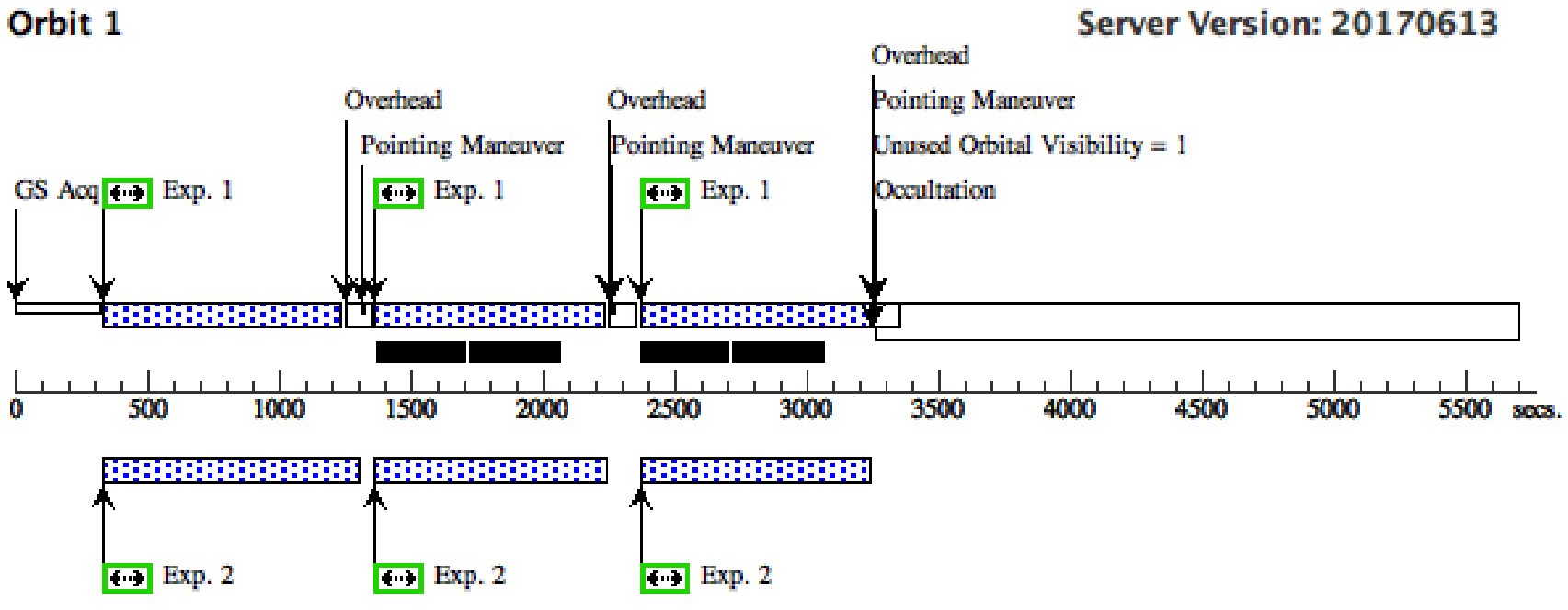
Fixed Targets

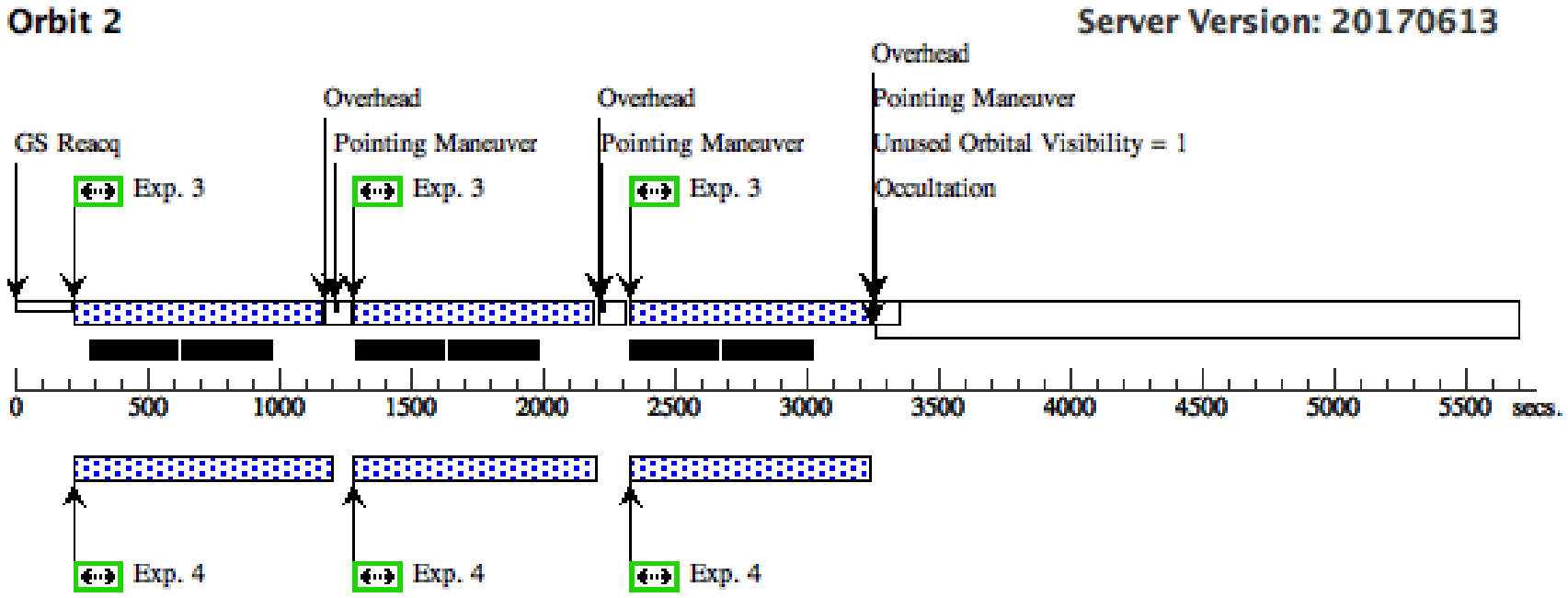
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	UGC-2885	RA: 03 53 2.4400 (58.2601667d) Dec: +35 35 22.10 (35.58947d) Equinox: J2000		V=14.4+/-0.4	Reference Frame: SIMBAD
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					
(5)	UGC-2885-V08	RA: 03 52 53.3380 (58.2222417d) Dec: +35 35 35.64 (35.59323d) Equinox: J2000		V=14.4+/-0.4	Reference Frame: SIMBAD
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.					

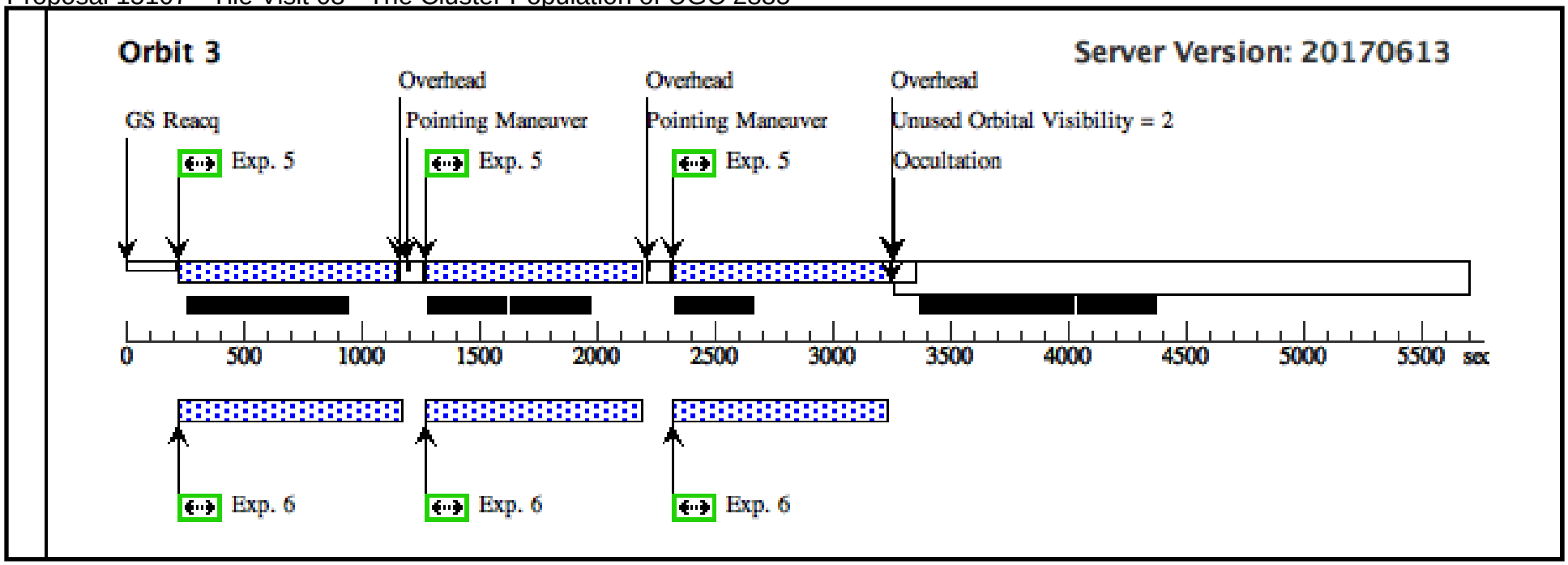
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(5) UGC-2885-V08	WFC3/UVIS, ACCUM, UVIS	F814W		POS TARG 0.0,0.0	Pattern 2, Exps 1-2 in Tile Visit 08 (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Tile Visit 08	1350 Secs (2625 Secs) *[==>875.0 Secs (Pattern 1)]* *[==>875.0 Secs (Pattern 2)]* *[==>875.0 Secs (Pattern 3)]*	***[1]***
2		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F814W			Pattern 2, Exps 1-2 in Tile Visit 08 (2) Prime + Parallel Group 1-2 in Pattern 2, Exps 1-2 in Tile Visit 08	1250 Secs (2270 Secs) *[==>760.0 Secs (Pattern 1)]* *[==>760.0 Secs (Pattern 2)]* *[==>750.0 Secs (Pattern 3)]*	***[1]***
3		(5) UGC-2885-V08	WFC3/UVIS, ACCUM, UVIS	F606W		POS TARG 0.0,0.0	Pattern 2, Exps 3-4 in Tile Visit 08 (2) Prime + Parallel Group 3-4 in Pattern 2, Exps 3-4 in Tile Visit 08	1350 Secs (2745 Secs) *[==>915.0 Secs (Pattern 1)]* *[==>915.0 Secs (Pattern 2)]* *[==>915.0 Secs (Pattern 3)]*	***[2]***
4		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F606W			Pattern 2, Exps 3-4 in Tile Visit 08 (2) Prime + Parallel Group 3-4 in Pattern 2, Exps 3-4 in Tile Visit 08	1250 Secs (2390 Secs) *[==>800.0 Secs (Pattern 1)]* *[==>800.0 Secs (Pattern 2)]* *[==>790.0 Secs (Pattern 3)]*	***[2]***
5		(5) UGC-2885-V08	WFC3/UVIS, ACCUM, UVIS	F475W		POS TARG 0.0,0.0	Pattern 2, Exps 5-6 in Tile Visit 08 (2) Prime + Parallel Group 5-6 in Pattern 2, Exps 5-6 in Tile Visit 08	1350 Secs (2760 Secs) *[==>920.0 Secs (Pattern 1)]* *[==>920.0 Secs (Pattern 2)]* *[==>920.0 Secs (Pattern 3)]*	***[3]***
6		(1) UGC-2885	ACS/WFC, ACCUM, WFC	F475W			Pattern 2, Exps 5-6 in Tile Visit 08 (2) Prime + Parallel Group 5-6 in Pattern 2, Exps 5-6 in Tile Visit 08	1250 Secs (2390 Secs) *[==>800.0 Secs (Pattern 1)]* *[==>800.0 Secs (Pattern 2)]* *[==>790.0 Secs (Pattern 3)]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20170613
GS Reacq
Overhead
Pointing Maneuver
Overhead
Pointing Maneuver
Overhead
Unused Orbital Visibility = 2
Occultation
Exp. 5
Exp. 5
Exp. 5
Exp. 6
Exp. 6
Exp. 6
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec