15308 - The HST Frontier Field MACS 1159.5+2223: Flanking Observations for Intracluster Light

Cycle: 25, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) MACSJ1149.5+2223-BRIDGE1 ANY	ACS/WFC WFC3/IR	2	21-Sep-2017 15:01:55.0	yes
02	(2) MACSJ1149.5+2223-BRIDGE2 ANY	ACS/WFC WFC3/IR	2	21-Sep-2017 15:01:58.0	yes
03	(3) MACSJ1149.5+2223-BRIDGE3 ANY	ACS/WFC WFC3/IR	2	21-Sep-2017 15:02:01.0	yes

6 Total Orbits Used

ABSTRACT

We propose a 6 orbit WFC3/IR imaging program targeting the environs of the HST Frontier Field cluster MACS 1149.5+2223 to obtain a comprehensive view of the intracluster stellar population in a massive galaxy cluster. WFC3/IR enables a vast improvement over ground-based studies in mapping emission from diffuse stellar populations. Our proposed observations are designed to build upon the existing investment in the Frontier Fields to conduct a new, more complete census of the intracluster light (ICL) extending out to ~750 kpc. The requested observations are constructed to span the gap between the primary and parallel HFF pointings, detecting ICL to a surface brightness of 29.5 mag per square arcsec in F160W (equivalent to 31.5 mag per square arcsec in V-band). This depth is sufficient to trace the radial ICL profile out to ~750 kpc from the BCG. These data will also yield a high-fidelity calibration of the background sky level, enabling two-dimensional mapping of the distribution and color of intracluster light down to 27 mag per square arcsec in F160W. From these maps we will quantify spatial variation in the ratio of the stellar baryons to the ICM, establishing whether the observed low scatter in the global ratio masks underlying smaller scale inhomogeneities due to astrophysical processes in the cluster. The requested observations further serve as a pilot program, enabling future similar analyses with the full ensemble of HFF clusters, and developing techniques that will be required for such low surface brightness programs with upcoming facilities including Euclid and WFIRST.

OBSERVING DESCRIPTION

Our proposed observations are designed to build upon the existing investment in the Frontier Fields to conduct a new, more complete census of the intracluster light (ICL) extending out to ~750 kpc. The requested observations are constructed to span the gap between the primary and parallel HFF pointings, detecting ICL to a surface brightness of 29.5 mag per square arcsec in F160W (equivalent to 31.5 mag per square arcsec in V-band).

Geometry: The basic geometry for the proposed observations is a linear series of overlapping WFC3/IR frames bridging the gap between the primary and parallel HFF fields (Figure 3). With proper overlap, the bridging fields can be used to correct for the temporal differences between the primary and parallel fields and enable continuous determination of the ICL brightness with radius. Three exposures is the minimum number required to have meaningful overlap between frames, as the separation between the edges of the primary and parallel HFF fields is approximately 235". Three exposures enables an overlap of 20% between adjacent frames. For 20% overlap, the residual systematic uncertainty will be mu > 31 mag/arcsec^2 in F160W. It is critical that the bridging fields all have the same orientation as one another, and the same orientation as the HFF pointings to within 5 degrees.

Filters: The HST Frontier Fields program acquires data for each cluster in 3 ACS bands (F435W, F606W, F814W) and 4 WFC3/IR bands (F105W,

F125W, F140W, F160W). For this program, the science is driven by the need to extend spatial coverage in the WFC3/IR bands, both because of the smaller field-of-view of WFC3/IR and because the IR bands are most sensitive to intracluster light. The F105W and F160W filters provide a maximal wavelength lever arm in the IR bands for mapping out color gradients.

Depth: The two requirements for the depth are that the data yield sufficient fidelity for the sky level determination, and sufficient sensitivity to enable a radial measurement of the ICL extending to mu_160 = 29.5 mag/arcsec^2. For the sensitivity, the observations benefit from averaging in annular bins extending over the width of the detector. A single orbit in each filter is sufficient to reach SNR> 10 for the radial profile at mu_160 = 29.5 mag/arcsec^2. A 20% determination of the surface brightness at mu160 = 29.5 mag/arcsec^2 requires that the 1 sigma error in the background correspond to mu= 31 mag/arcsec^2, which is well-matched to the flatfielding described above.

Special Requirements: All observations should be taken in LOW SKY (our depth calculations account for this). These conditions gain us 0.3 mag/arcsec^2 relative to the average sky, enabling us to increase the spatial extent over which we can resolve structure in the ICL. We request that the orientation of the WFC3/IR images be aligned with the Frontier Fields WFC3/IR parallel observations to within 5 degrees. This orientation is designed to maximize overlap for relative sky calibration during LOW SKY conditions.

Parallel Fields: To maximize the legacy value of this program and enhance the Frontier Fields data sets, we are taking parallel observations with ACS, split between F814W and F606W. These data will enable an extension of weak lensing analyses into these flanking regions.

Visit

Proposal 15308, Bridge 1 (01), implementation Thu Sep 21 19:02:03 GMT 2017

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: ORIENT 300D TO 310 D; ORIENT 120D TO 130 D

Fixed Targets

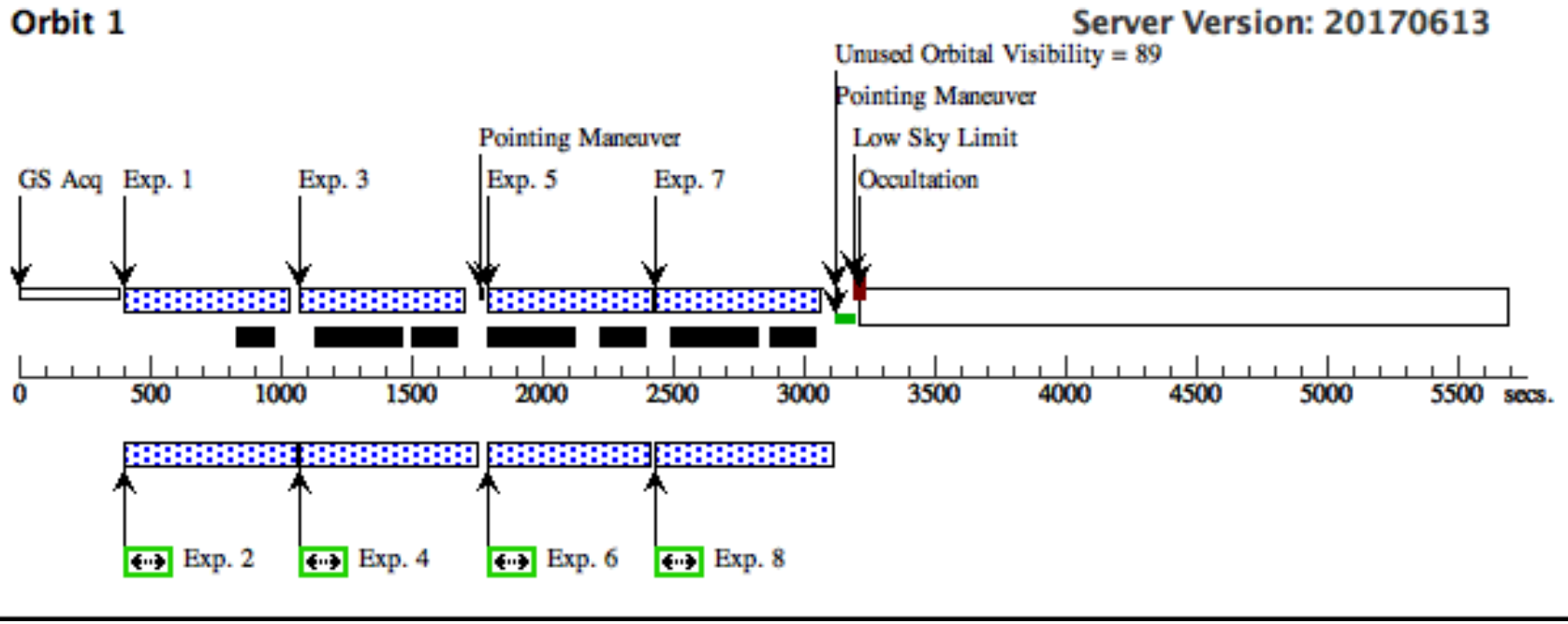
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	MACSJ1149.5+2223-BRIDGE1	RA: 11 49 37.3630 (177.4056792d) Dec: +22 22 29.10 (22.37475d) Equinox: J2000		V=27	Reference Frame: ICRS

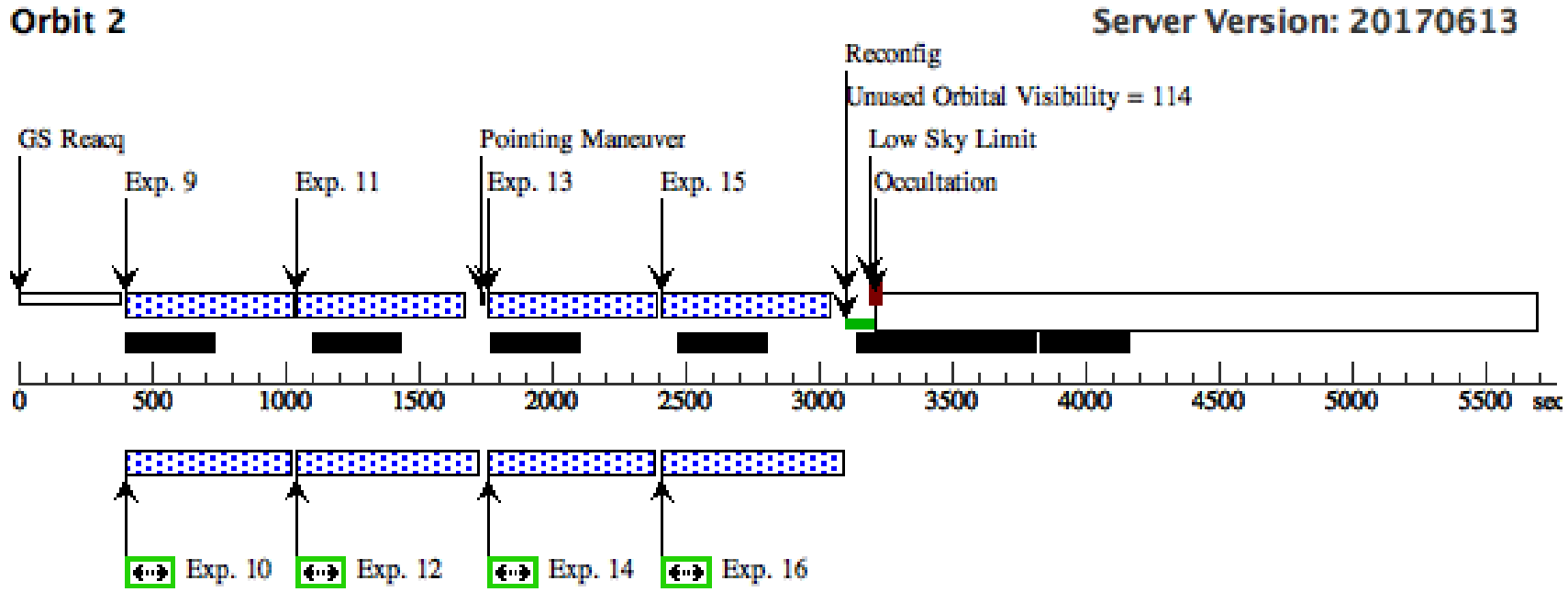
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) MACSJ1149.5+2223-BRIDGE1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.93,-1.729; LOW-SKY; GS ACQ SCENARIO BASE1B3	Sequence 1-8 Non-Int in Bridge 1 (01) Prime + Parallel Group 1-2 in Sequence 1-8 Non-Int in Bridge 1 (01)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
2		ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 1-8 Non-Int in Bridge 1 (01) Prime + Parallel Group 1-2 in Sequence 1-8 Non-Int in Bridge 1 (01)	450 Secs (450 Secs) *[==>]*	***[1]***
3		(1) MACSJ1149.5+2223-BRIDGE1	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.93,-1.729; LOW-SKY	Sequence 1-8 Non-Int in Bridge 1 (01) Prime + Parallel Group 3-4 in Sequence 1-8 Non-Int in Bridge 1 (01)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
4		ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 1-8 Non-Int in Bridge 1 (01) Prime + Parallel Group 3-4 in Sequence 1-8 Non-Int in Bridge 1 (01)	500 Secs (500 Secs) *[==>]*	***[1]***
5		(1) MACSJ1149.5+2223-BRIDGE1	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 1.93,1.729; LOW-SKY	Sequence 1-8 Non-Int in Bridge 1 (01) Prime + Parallel Group 5-6 in Sequence 1-8 Non-Int in Bridge 1 (01)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
6		ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 1-8 Non-Int in Bridge 1 (01) Prime + Parallel Group 5-6 in Sequence 1-8 Non-Int in Bridge 1 (01)	500 Secs (500 Secs) *[==>]*	***[1]***
7		(1) MACSJ1149.5+2223-BRIDGE1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 1.93,1.729; LOW-SKY	Sequence 1-8 Non-Int in Bridge 1 (01) Prime + Parallel Group 7-8 in Sequence 1-8 Non-Int in Bridge 1 (01)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
8		ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 1-8 Non-Int in Bridge 1 (01) Prime + Parallel Group 7-8 in Sequence 1-8 Non-Int in Bridge 1 (01)	500 Secs (500 Secs) *[==>]*	***[1]***
9		(1) MACSJ1149.5+2223-BRIDGE1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.456,-1.305; LOW-SKY	Sequence 9-16 Non-Int in Bridge 1 (01) Prime + Parallel Group 9-10 in Sequence 9-16 Non-Int in Bridge 1 (01)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***

	10	ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 9-16 Non-Int in Bridge 1 (01) Prime + Parallel Group 9-10 in Sequence 9-16 Non-Int in Bridge 1 (01)	500 Secs (500 Secs) *[==>]*	***[2]***
	11	(1) MACSJ1149.5+2223-BRIDGE1	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.456,-1.305; LOW-SKY	Sequence 9-16 Non-Int in Bridge 1 (01) Prime + Parallel Group 11-12 in Sequence 9-16 Non-Int in Bridge 1 (01)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***
	12	ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 9-16 Non-Int in Bridge 1 (01) Prime + Parallel Group 11-12 in Sequence 9-16 Non-Int in Bridge 1 (01)	500 Secs (500 Secs) *[==>]*	***[2]***
	13	(1) MACSJ1149.5+2223-BRIDGE1	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 2.404,2.153; LOW-SKY	Sequence 9-16 Non-Int in Bridge 1 (01) Prime + Parallel Group 13-14 in Sequence 9-16 Non-Int in Bridge 1 (01)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***
	14	ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 9-16 Non-Int in Bridge 1 (01) Prime + Parallel Group 13-14 in Sequence 9-16 Non-Int in Bridge 1 (01)	500 Secs (500 Secs) *[==>]*	***[2]***
	15	(1) MACSJ1149.5+2223-BRIDGE1	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 2.404,2.153; LOW-SKY	Sequence 9-16 Non-Int in Bridge 1 (01) Prime + Parallel Group 15-16 in Sequence 9-16 Non-Int in Bridge 1 (01)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***
	16	ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 9-16 Non-Int in Bridge 1 (01) Prime + Parallel Group 15-16 in Sequence 9-16 Non-Int in Bridge 1 (01)	500 Secs (500 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 15308, Bridge 2 (02), implementation Thu Sep 21 19:02:03 GMT 2017

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: SAME ORIENT AS 01

Fixed Targets

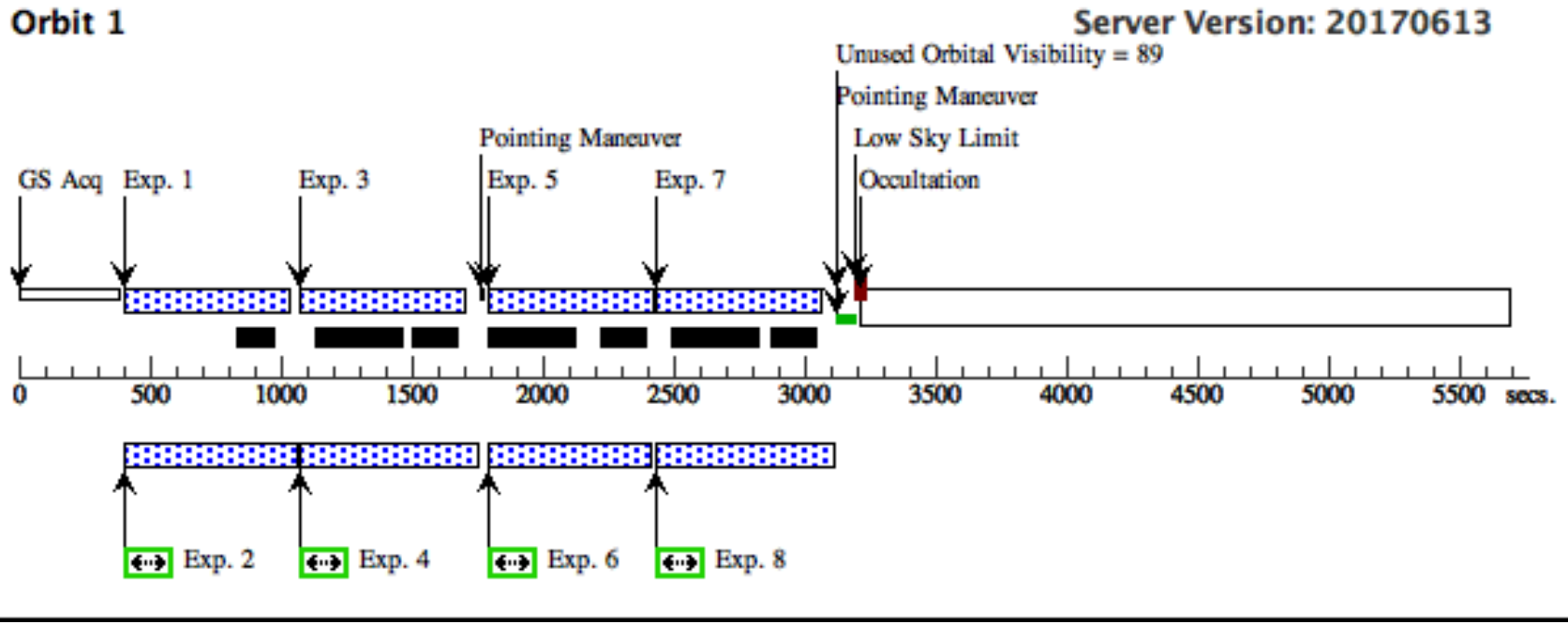
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	MACSJ1149.5+2223-BRIDGE2	RA: 11 49 38.3930 (177.4099708d) Dec: +22 21 0.21 (22.35006d) Equinox: J2000		V=27	Reference Frame: ICRS

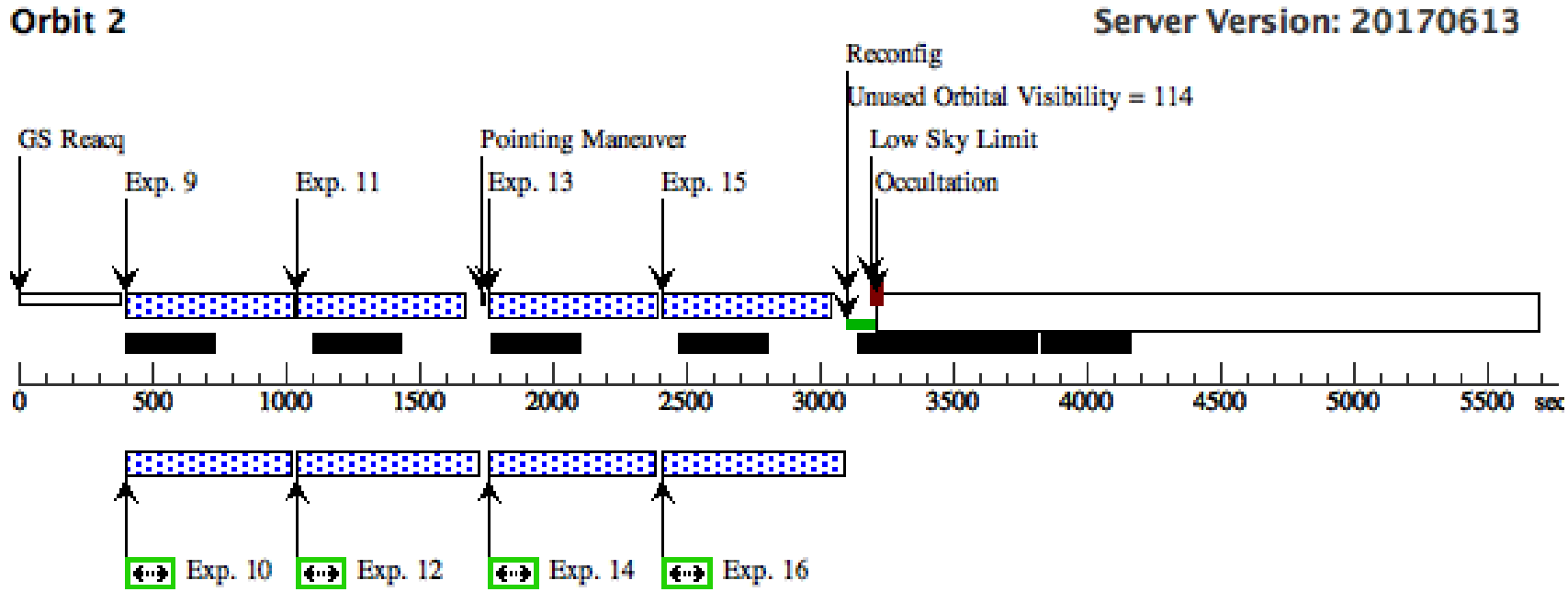
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(2) MACSJ1149.5+2223-BRIDGE2	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.93,-1.729; LOW-SKY; GS ACQ SCENARIO BASE1B3	Sequence 1-8 Non-Int in Bridge 2 (02) Prime + Parallel Group 1-2 in Sequence 1-8 Non-Int in Bridge 2 (02)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
2		ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 1-8 Non-Int in Bridge 2 (02) Prime + Parallel Group 1-2 in Sequence 1-8 Non-Int in Bridge 2 (02)	450 Secs (450 Secs) *[==>]*	***[1]***
3		(2) MACSJ1149.5+2223-BRIDGE2	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.93,-1.729; LOW-SKY	Sequence 1-8 Non-Int in Bridge 2 (02) Prime + Parallel Group 3-4 in Sequence 1-8 Non-Int in Bridge 2 (02)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
4		ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 1-8 Non-Int in Bridge 2 (02) Prime + Parallel Group 3-4 in Sequence 1-8 Non-Int in Bridge 2 (02)	500 Secs (500 Secs) *[==>]*	***[1]***
5		(2) MACSJ1149.5+2223-BRIDGE2	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 1.93,1.729; LOW-SKY	Sequence 1-8 Non-Int in Bridge 2 (02) Prime + Parallel Group 5-6 in Sequence 1-8 Non-Int in Bridge 2 (02)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
6		ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 1-8 Non-Int in Bridge 2 (02) Prime + Parallel Group 5-6 in Sequence 1-8 Non-Int in Bridge 2 (02)	500 Secs (500 Secs) *[==>]*	***[1]***
7		(2) MACSJ1149.5+2223-BRIDGE2	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 1.93,1.729; LOW-SKY	Sequence 1-8 Non-Int in Bridge 2 (02) Prime + Parallel Group 7-8 in Sequence 1-8 Non-Int in Bridge 2 (02)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
8		ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 1-8 Non-Int in Bridge 2 (02) Prime + Parallel Group 7-8 in Sequence 1-8 Non-Int in Bridge 2 (02)	500 Secs (500 Secs) *[==>]*	***[1]***
9		(2) MACSJ1149.5+2223-BRIDGE2	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.456,-1.305; LOW-SKY	Sequence 9-16 Non-Int in Bridge 2 (02) Prime + Parallel Group 9-10 in Sequence 9-16 Non-Int in Bridge 2 (02)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***

	10	ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 9-16 Non-Int in Bridge 2 (02) Prime + Parallel Group 9-10 in Sequence 9-16 Non-Int in Bridge 2 (02)	500 Secs (500 Secs) *[==>]*	***[2]***
	11	(2) MACSJ1149.5+2223-BRIDGE2	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.456,-1.305; LOW-SKY	Sequence 9-16 Non-Int in Bridge 2 (02) Prime + Parallel Group 11-12 in Sequence 9-16 Non-Int in Bridge 2 (02)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***
	12	ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 9-16 Non-Int in Bridge 2 (02) Prime + Parallel Group 11-12 in Sequence 9-16 Non-Int in Bridge 2 (02)	500 Secs (500 Secs) *[==>]*	***[2]***
	13	(2) MACSJ1149.5+2223-BRIDGE2	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 2.404,2.153; LOW-SKY	Sequence 9-16 Non-Int in Bridge 2 (02) Prime + Parallel Group 13-14 in Sequence 9-16 Non-Int in Bridge 2 (02)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***
	14	ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 9-16 Non-Int in Bridge 2 (02) Prime + Parallel Group 13-14 in Sequence 9-16 Non-Int in Bridge 2 (02)	500 Secs (500 Secs) *[==>]*	***[2]***
	15	(2) MACSJ1149.5+2223-BRIDGE2	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 2.404,2.153; LOW-SKY	Sequence 9-16 Non-Int in Bridge 2 (02) Prime + Parallel Group 15-16 in Sequence 9-16 Non-Int in Bridge 2 (02)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***
	16	ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 9-16 Non-Int in Bridge 2 (02) Prime + Parallel Group 15-16 in Sequence 9-16 Non-Int in Bridge 2 (02)	500 Secs (500 Secs) *[==>]*	***[2]***

Orbit Structure





Visit

Proposal 15308, Bridge 3 (03), implementation Thu Sep 21 19:02:03 GMT 2017

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, ACS/WFC

Special Requirements: SAME ORIENT AS 01

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	MACSJ1149.5+2223-BRIDGE3	RA: 11 49 39.4220 (177.4142583d) Dec: +22 19 31.24 (22.32534d) Equinox: J2000		V=27	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) MACSJ1149.5+2223-BRIDGE3	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.93,-1.729; LOW-SKY; GS ACQ SCENARIO BASE1B3	Sequence 1-8 Non-Int in Bridge 3 (03) Prime + Parallel Group 1-2 in Sequence 1-8 Non-Int in Bridge 3 (03)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
2		ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 1-8 Non-Int in Bridge 3 (03) Prime + Parallel Group 1-2 in Sequence 1-8 Non-Int in Bridge 3 (03)	450 Secs (450 Secs) *[==>]*	***[1]***
3		(3) MACSJ1149.5+2223-BRIDGE3	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.93,-1.729; LOW-SKY	Sequence 1-8 Non-Int in Bridge 3 (03) Prime + Parallel Group 3-4 in Sequence 1-8 Non-Int in Bridge 3 (03)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
4		ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 1-8 Non-Int in Bridge 3 (03) Prime + Parallel Group 3-4 in Sequence 1-8 Non-Int in Bridge 3 (03)	500 Secs (500 Secs) *[==>]*	***[1]***
5		(3) MACSJ1149.5+2223-BRIDGE3	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 1.93,1.729; LOW-SKY	Sequence 1-8 Non-Int in Bridge 3 (03) Prime + Parallel Group 5-6 in Sequence 1-8 Non-Int in Bridge 3 (03)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
6		ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 1-8 Non-Int in Bridge 3 (03) Prime + Parallel Group 5-6 in Sequence 1-8 Non-Int in Bridge 3 (03)	500 Secs (500 Secs) *[==>]*	***[1]***
7		(3) MACSJ1149.5+2223-BRIDGE3	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 1.93,1.729; LOW-SKY	Sequence 1-8 Non-Int in Bridge 3 (03) Prime + Parallel Group 7-8 in Sequence 1-8 Non-Int in Bridge 3 (03)	602.934229 Secs (602.934 Secs) *[==>]*	***[1]***
8		ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 1-8 Non-Int in Bridge 3 (03) Prime + Parallel Group 7-8 in Sequence 1-8 Non-Int in Bridge 3 (03)	500 Secs (500 Secs) *[==>]*	***[1]***
9		(3) MACSJ1149.5+2223-BRIDGE3	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.456,-1.305; LOW-SKY	Sequence 9-16 Non-Int in Bridge 3 (03) Prime + Parallel Group 9-10 in Sequence 9-16 Non-Int in Bridge 3 (03)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***

	10	ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 9-16 Non-Int in Bridge 3 (03) Prime + Parallel Group 9-10 in Sequence 9-16 Non-Int in Bridge 3 (03)	500 Secs (500 Secs) *[==>]*	***[2]***
	11	(3) MACSJ1149.5+2223-BRIDGE3	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG -1.456,-1.305; LOW-SKY	Sequence 9-16 Non-Int in Bridge 3 (03) Prime + Parallel Group 11-12 in Sequence 9-16 Non-Int in Bridge 3 (03)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***
	12	ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 9-16 Non-Int in Bridge 3 (03) Prime + Parallel Group 11-12 in Sequence 9-16 Non-Int in Bridge 3 (03)	500 Secs (500 Secs) *[==>]*	***[2]***
	13	(3) MACSJ1149.5+2223-BRIDGE3	WFC3/IR, MULTIACCUM, IR-FIX	F105W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 2.404,2.153; LOW-SKY	Sequence 9-16 Non-Int in Bridge 3 (03) Prime + Parallel Group 13-14 in Sequence 9-16 Non-Int in Bridge 3 (03)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***
	14	ANY	ACS/WFC, ACCUM, WFC-FIX	F606W			Sequence 9-16 Non-Int in Bridge 3 (03) Prime + Parallel Group 13-14 in Sequence 9-16 Non-Int in Bridge 3 (03)	500 Secs (500 Secs) *[==>]*	***[2]***
	15	(3) MACSJ1149.5+2223-BRIDGE3	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=7; SAMP-SEQ=SPARS100	POS TARG 2.404,2.153; LOW-SKY	Sequence 9-16 Non-Int in Bridge 3 (03) Prime + Parallel Group 15-16 in Sequence 9-16 Non-Int in Bridge 3 (03)	602.934229 Secs (602.934 Secs) *[==>]*	***[2]***
	16	ANY	ACS/WFC, ACCUM, WFC-FIX	F814W			Sequence 9-16 Non-Int in Bridge 3 (03) Prime + Parallel Group 15-16 in Sequence 9-16 Non-Int in Bridge 3 (03)	500 Secs (500 Secs) *[==>]*	***[2]***

Orbit Structure