13445 - Absolute Calibration of the Extragalactic Mira Period-Luminosity Relation

Cycle: 21, 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) NGC4258	WFC3/IR	2	11-Jul-2013 20:46:07.0	yes
02	(1) NGC4258	WFC3/IR	1	11-Jul-2013 20:46:16.0	yes
03	(1) NGC4258	WFC3/IR	1	11-Jul-2013 20:46:22.0	yes
04	(1) NGC4258	WFC3/IR	1	11-Jul-2013 20:46:29.0	yes
05	(1) NGC4258	WFC3/IR	1	11-Jul-2013 20:46:34.0	yes
06	(1) NGC4258	WFC3/IR	1	11-Jul-2013 20:46:40.0	yes
07	(1) NGC4258	WFC3/IR	1	11-Jul-2013 20:46:45.0	yes
08	(1) NGC4258	WFC3/IR	1	11-Jul-2013 20:46:50.0	yes
09	(1) NGC4258	WFC3/IR	1	11-Jul-2013 20:46:56.0	yes
10	(1) NGC4258	WFC3/IR	1	11-Jul-2013 20:47:01.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
11	(1) NGC4258	WFC3/IR	1	11-Jul-2013 20:47:06.0	yes
12	(1) NGC4258	WFC3/IR	1	11-Jul-2013 20:47:12.0	yes

13 Total Orbits Used

ABSTRACT

In this era of precision measurement of the parameters of the cosmological equation of state, constraining the present-day value of the Hubble constant remains a vital endeavor: uncertainties in H_0 couple directly to imprecision in the matter and dark energy contributions to the evolution of the universe (e.g., w, and w1). Starting with the HST Key Project more than a decade ago, the uncertainty in H_0 has been cut from over 10% to something approaching 3%. A major advance was made recently, leapfrogging Milky Way calibrations, by directly anchoring the infrared Cepheid Period-Luminosity (PL) relation to NGC 4258, the famous megamaser galaxy with a highly precise geometric distance. We propose to anchor the infrared PL relation of Mira variables to NGC 4258, providing the first-ever absolute extragalactic PL relation of such stars, opening a new avenue for precision H_0 efforts. In the infrared, Miras are comparable in absolute magnitude to Cepheids, and thus are direct complements to Cepheids within the same volume (up to ~25 Mpc). The principal advantage of Miras, however, is that they are ~20 times more numerous than Cepheids. Thus, a Mira-focused distance measurement study can cover 5% of the surface area of a Cepheid-focused study and achieve a comparable distance measurement accuracy. Over the 12 proposed visits with WFC3/F160W/F125W, and coupled with previous observations of the field, we expect to discover and characterize ~1000 Miras, accurately identifying periods <~ 550 days. This investment now should demonstrate significant observing efficiency increases for JWST if indeed Miras are found to be an acceptable replacement to Cepheids.

OBSERVING DESCRIPTION

We propose to observe approximately one epoch of one field in NGC 4258 per month throughout Cycle 21 (12 epochs total). The proposed observations will overlap with the full galaxy mosaic taken during Cycle 17 as part of program GO-11570 (PI: Riess), and we have selected the target field to also overlap with the "inner" ACS field of the Cycle 12 program GO-9810 (PI: Greenhill). These previous studies focused on discovering Cepheid variables do not offer the necessary time baseline for discovery of the longer-period Mira variables, which is the goal of the present proposal. However, selecting our target field to overlap with these earlier observations does provide additional epochs and will be of significant assistance in identifying Miras.

All observations will be taken with the WFC3 instrument through the IR/F160W and IR/F125W filters. We will use the F160W light curves to

measure the periods and mean magnitudes of the Mira variables. The F125W data is necessary for separating out the O-rich and C-rich Mira sub-populations. The first visit will comprise 2 orbits, one dedicated to a deep integration with F160W (4 x 702.939 secs) and the other with F125W (also 4 x 702.939 secs). This initial visit provides an epoch for the F160W light curves as well as the same-phase color-magnitude information for separating the Mira sub-populations. In the next 11 visits, each comprised of one orbit, we will obtain one shallow F125W exposure (1 x 352.835 secs) and one deep F160W integration (4 x 552.937 secs). Wherever an integration is composed of 4 exposures we use the WFC3-IR-DITHER-BOX-MIN dither pattern. The 11 one-orbit visits will flesh out the rest of the F160W Mira light curves, provide F125W light curves for the brightest Miras, and furnish data for a "phase-average" color-magnitude diagram.

Because our visits must be spaced throughout the cycle, specifying roll angle restrictions is impractical. Our final dataset will have 12 epochs for each source within the inscribed circle and fewer epochs at larger radii from the field center (depending on how the fields of view overlap).

REAL TIME JUSTIFICATION

The special scheduling requirements needed for this project are to space the 12 epochs as evenly as possible throughout the Cycle. Unfortunately, because of the Sun restriction, we can only observe the target from October 1, 2013 (start of the Cycle) to August 5, 2014 (baseline of ~10 months). The visit scheduling was run with the first visit fixed to be between October 1, 2013 and October 7, 2013 and then each subsequent visit occurring between 27 and 31 days after the preceding visit. To sample the full light curve of Mira variables we need to observe with a baseline at least as long as a typical Mira's period and with evenly spaced (although not identically spaced) epochs. This is necessary for recovering an accurate period and temporal mean magnitude for each light curve. The addition of the Cycle 17 data is very helpful in recovering periods longer than 1 year, but every possible advantage from scheduling strategy in the current Cycle should be cultivated.

Visit

Proposal 13445, First visit, initial J and H exposures (01), implementation Fri Jul 12 00:47:19 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: BETWEEN 01-OCT-2013:00:00:00 AND 07-OCT-2013:00:00:00

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(1), (2)

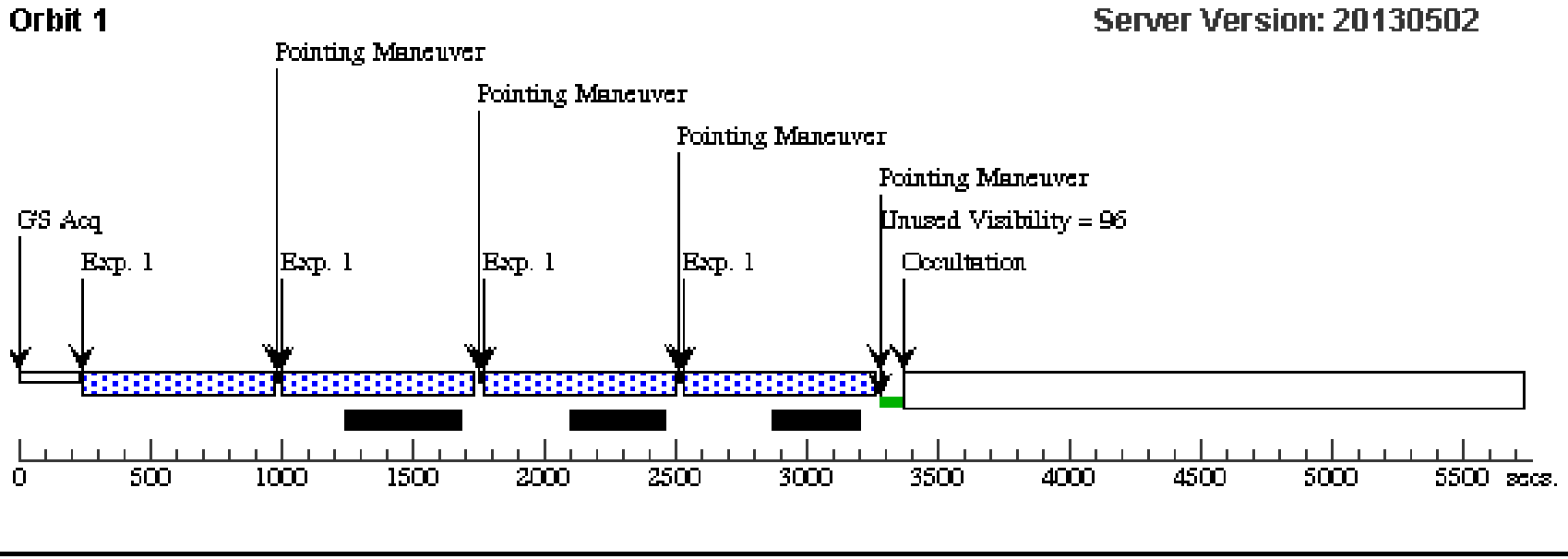
Fixed Targets

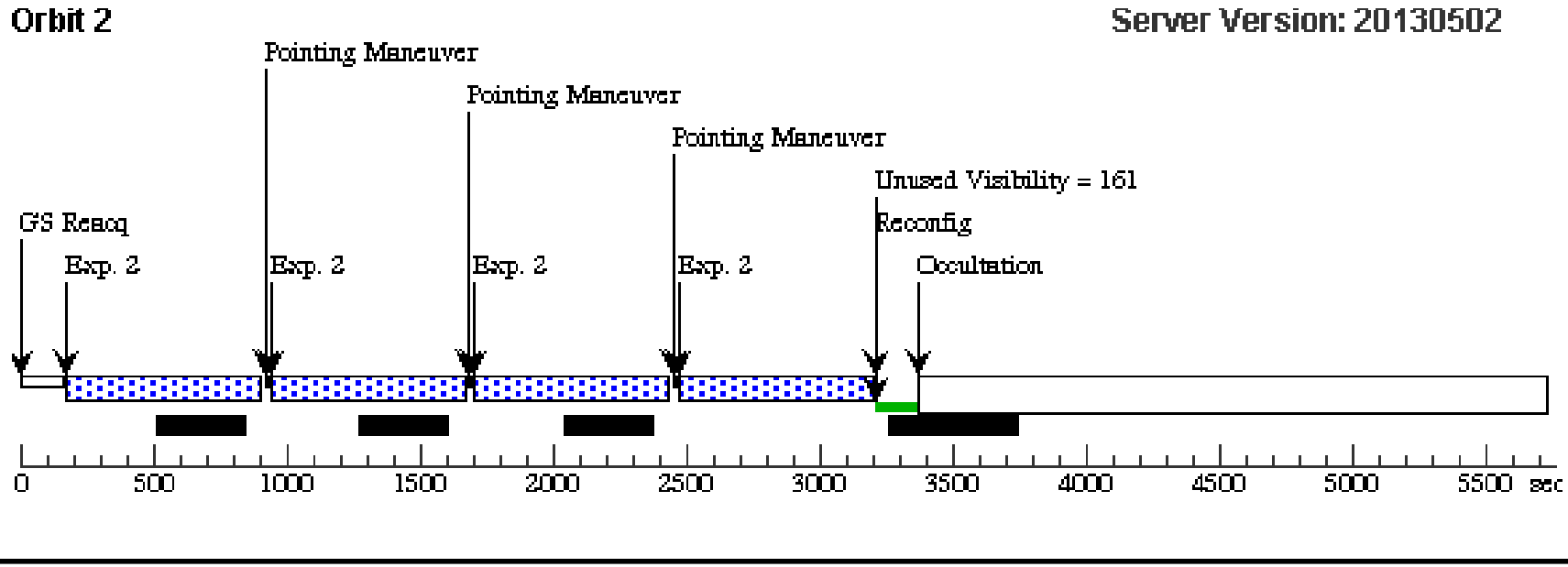
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	First exposure, 1 orbit in J	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=15; SAMP-SEQ=SPARS50	GS ACQ SCENARIO ONEB1B3	Pattern 1, Exps 1-1 in First visit, initial J and H exposures (01) (1)	702.938605 Secs (2811.754 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2	Second exposure, 1 orbit in H	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=15; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in First visit, initial J and H exposures (01) (1)	702.938605 Secs (2811.754 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[2]***

Orbit Structure





Visit

Proposal 13445, Normal visit, 1-J and 4-H (02), implementation Fri Jul 12 00:47:22 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: BETWEEN 17-NOV-2013 AND 20-NOV-2013

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)

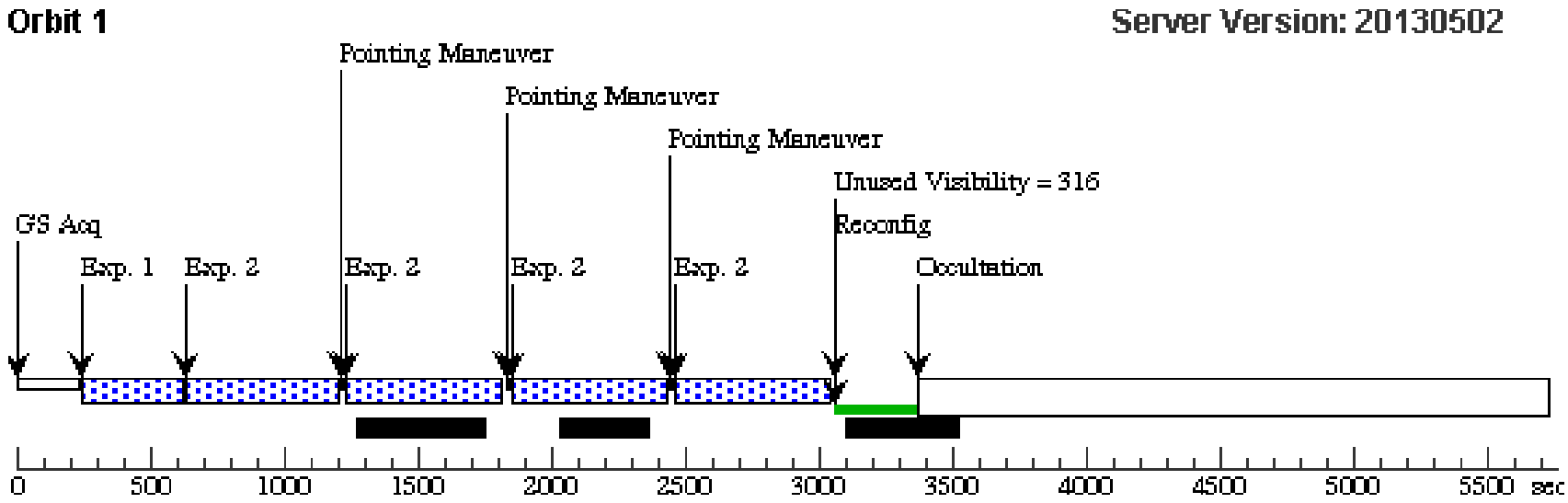
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	1 J exposure	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=8; SAMP-SEQ=SPARS50	GS ACQ SCENARIO ONEB1B3		352.935448 Secs (352.935 Secs) *[==>]*	*[1]*
2	4 H exposures	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in Normal visit, 1-J and 4-H (02) (1)	552.937252 Secs (2211.749 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 13445, Normal visit, 1-J and 4-H (03), implementation Fri Jul 12 00:47:23 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: BETWEEN 25-NOV-2013 AND 05-DEC-2013

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)

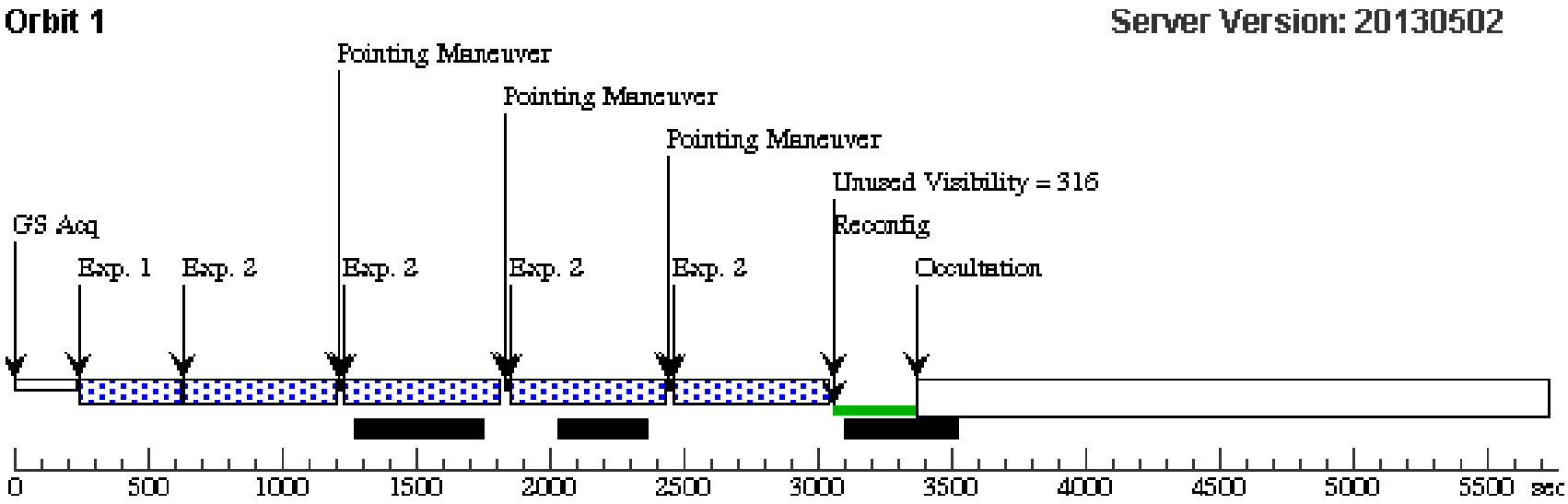
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	1 J exposure	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=8; SAMP-SEQ=SPARS50	GS ACQ SCENARIO ONEB1B3		352.935448 Secs (352.935 Secs) *[==>]*	*[1]*
2	4 H exposures	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in Normal visit, 1-J and 4-H (03) (1)	552.937252 Secs (2211.749 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 13445, Normal visit, 1-J and 4-H (04), implementation Fri Jul 12 00:47:24 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: BETWEEN 22-DEC-2013 AND 01-JAN-2014

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)

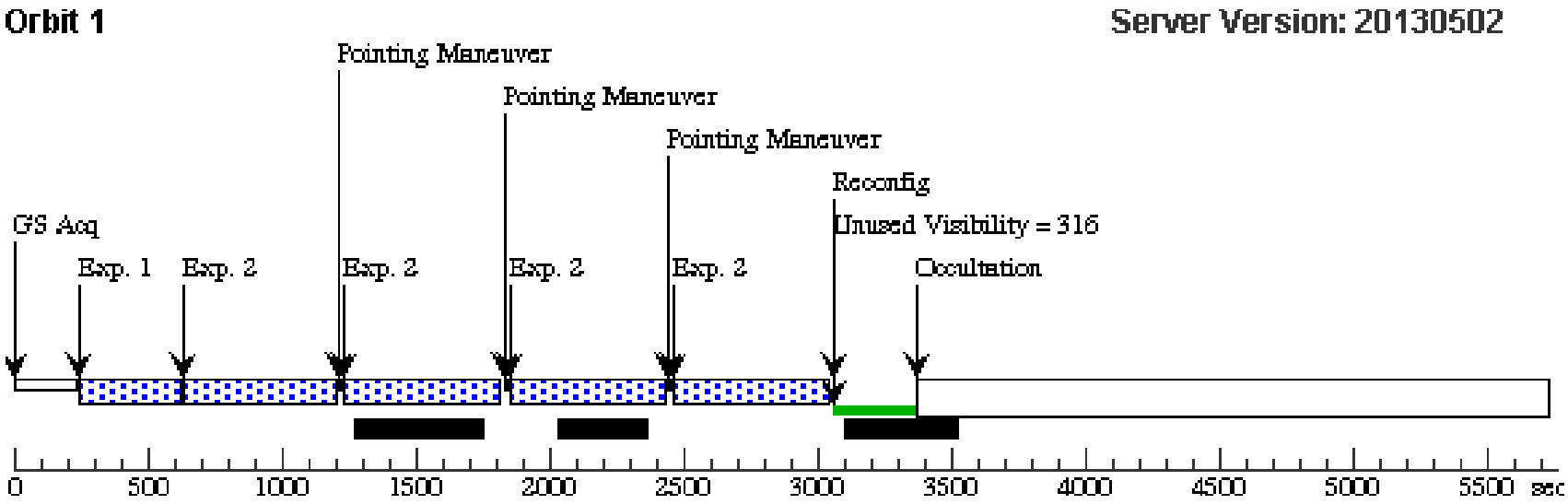
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	1 J exposure	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=8; SAMP-SEQ=SPARS50	GS ACQ SCENARIO ONEB1B3		352.935448 Secs (352.935 Secs) *[==>]*	*[1]*
2	4 H exposures	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in Normal visit, 1-J and 4-H (04) (1)	552.937252 Secs (2211.749 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 13445, Normal visit, 1-J and 4-H (05), implementation Fri Jul 12 00:47:24 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: BETWEEN 18-JAN-2014 AND 28-JAN-2014

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)

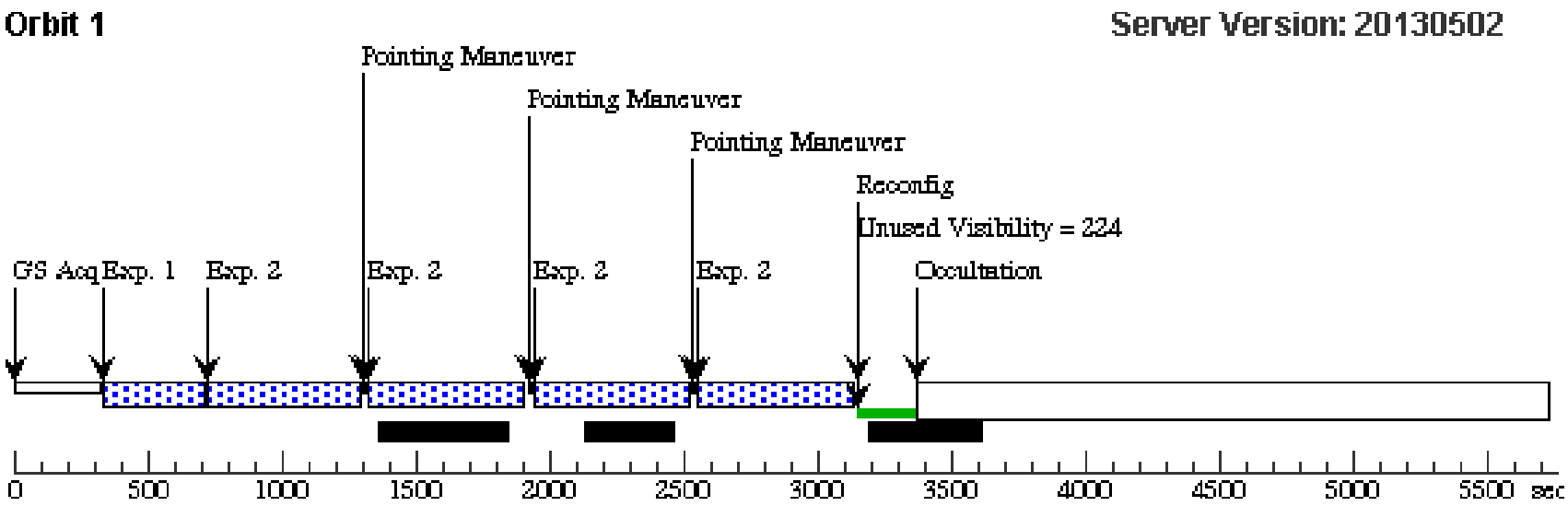
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	1 J exposure	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=8; SAMP-SEQ=SPARS50	GS ACQ SCENARIO BASE1B3		352.935448 Secs (352.935 Secs) *[==>]*	*[1]*
2	4 H exposures	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in Normal visit, 1-J and 4-H (05) (1)	552.937252 Secs (2211.749 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 13445, Normal visit, 1-J and 4-H (06), implementation Fri Jul 12 00:47:25 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: BETWEEN 11-FEB-2014 AND 15-FEB-2014

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)

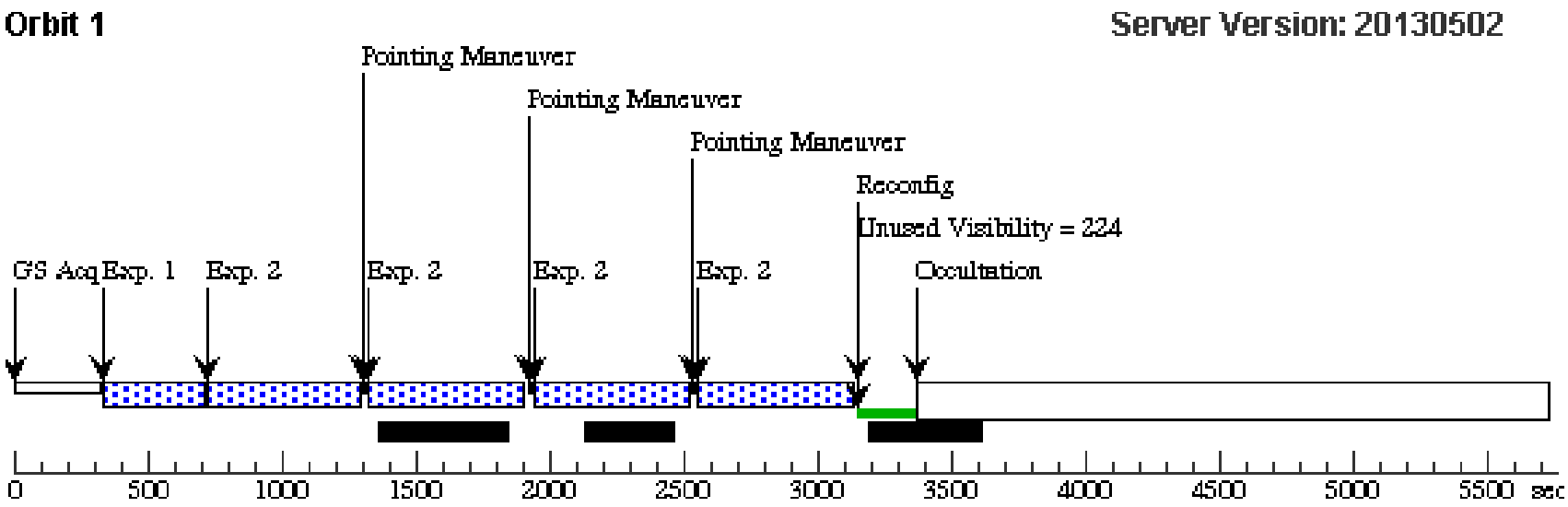
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	1 J exposure	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=8; SAMP-SEQ=SPARS50	GS ACQ SCENARIO BASE1B3		352.935448 Secs (352.935 Secs) *[==>]*	*[1]*
2	4 H exposures	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in Normal visit, 1-J and 4-H (06) (1)	552.937252 Secs (2211.749 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 13445, Normal visit, 1-J and 4-H (07), implementation Fri Jul 12 00:47:26 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: AFTER 06 BY 27 D TO 31 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)

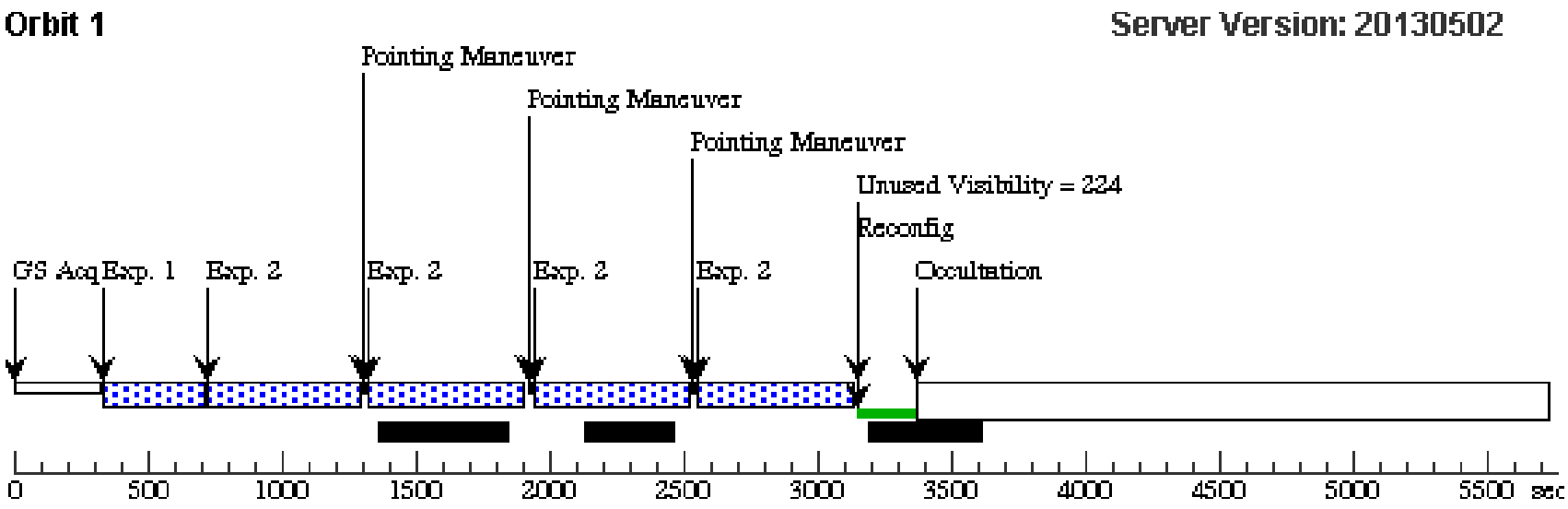
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	1 J exposure	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=8; SAMP-SEQ=SPARS50	GS ACQ SCENARIO BASE1B3		352.935448 Secs (352.935 Secs) *[==>]*	*[1]*
2	4 H exposures	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in Normal visit, 1-J and 4-H (07) (1)	552.937252 Secs (2211.749 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 13445, Normal visit, 1-J and 4-H (08), implementation Fri Jul 12 00:47:26 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: AFTER 07 BY 27 D TO 31 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)

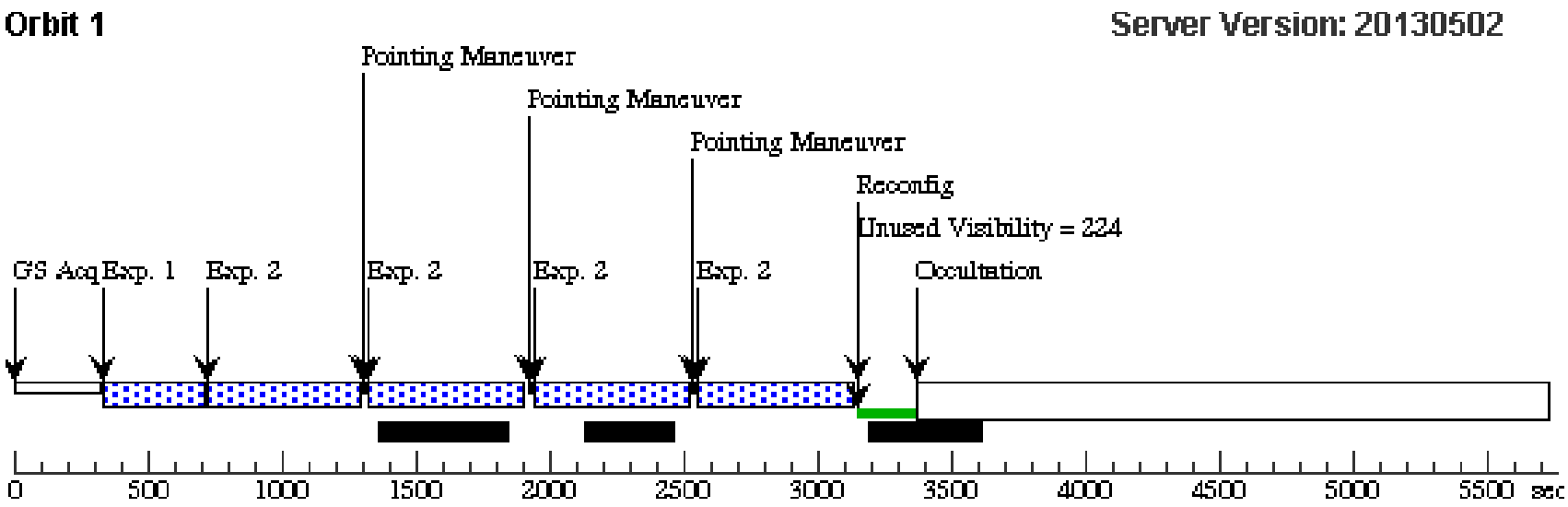
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	1 J exposure	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=8; SAMP-SEQ=SPARS50	GS ACQ SCENARIO BASE1B3		352.935448 Secs (352.935 Secs) *[==>]*	*[1]*
2	4 H exposures	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in Normal visit, 1-J and 4-H (08) (1)	552.937252 Secs (2211.749 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 13445, Normal visit, 1-J and 4-H (09), implementation Fri Jul 12 00:47:27 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: AFTER 08 BY 27 D TO 31 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)

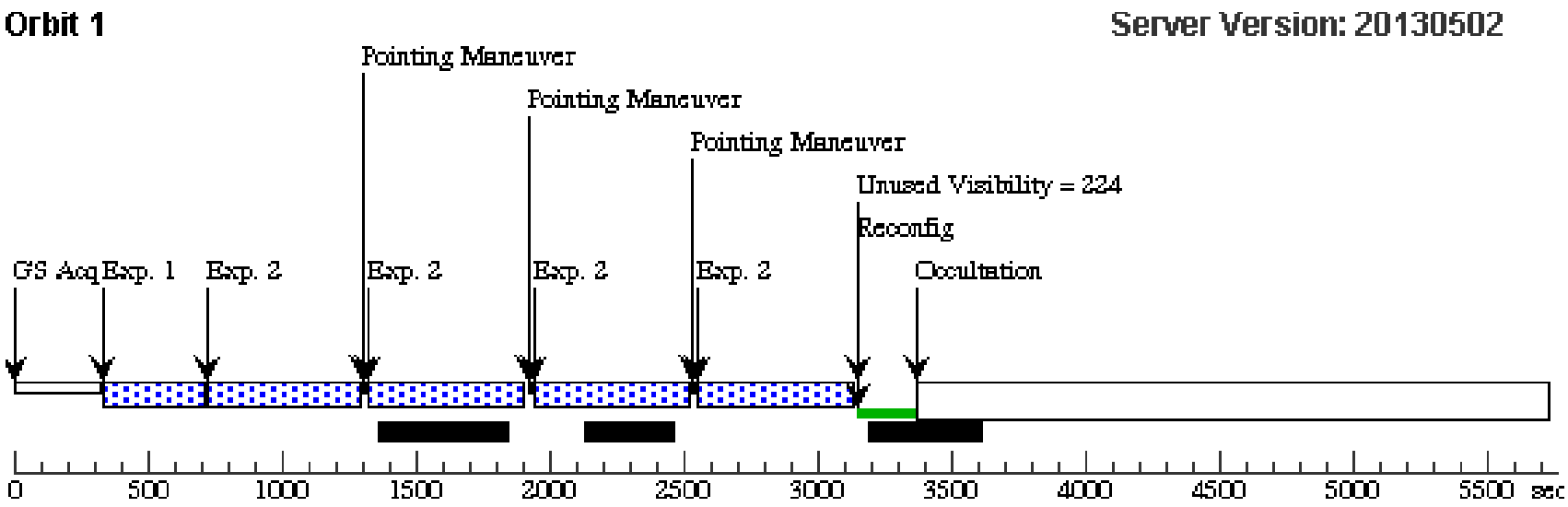
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	1 J exposure	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=8; SAMP-SEQ=SPARS50	GS ACQ SCENARIO BASE1B3		352.935448 Secs (352.935 Secs) *[==>]*	***[1]***
2	4 H exposures	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in Normal visit, 1-J and 4-H (09) (1)	552.937252 Secs (2211.749 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure



Visit

Proposal 13445, Normal visit, 1-J and 4-H (10), implementation Fri Jul 12 00:47:28 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: AFTER_09 BY 27 D TO 31 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)

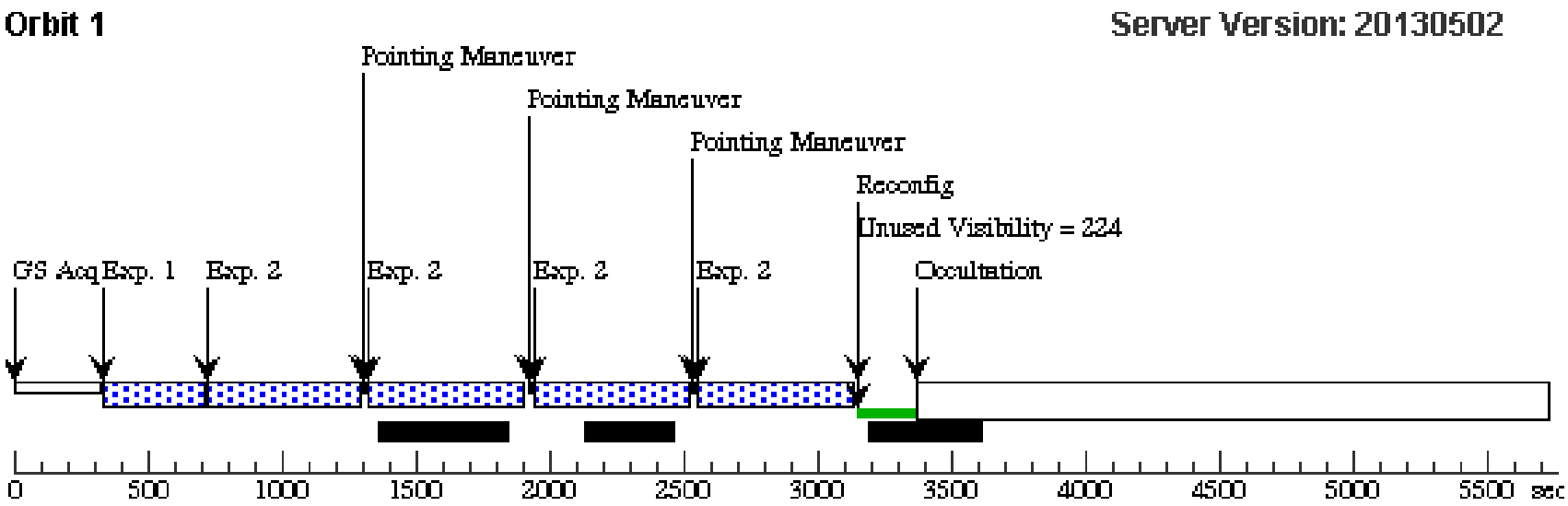
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	1 J exposure	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=8; SAMP-SEQ=SPARS50	GS ACQ SCENARIO BASE1B3		352.935448 Secs (352.935 Secs) *[==>]*	*[1]*
2	4 H exposures	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in Normal visit, 1-J and 4-H (10) (1)	552.937252 Secs (2211.749 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*

Orbit Structure



Visit

Proposal 13445, Normal visit, 1-J and 4-H (11), implementation Fri Jul 12 00:47:28 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: AFTER 10 BY 27 D TO 31 D

Patterns

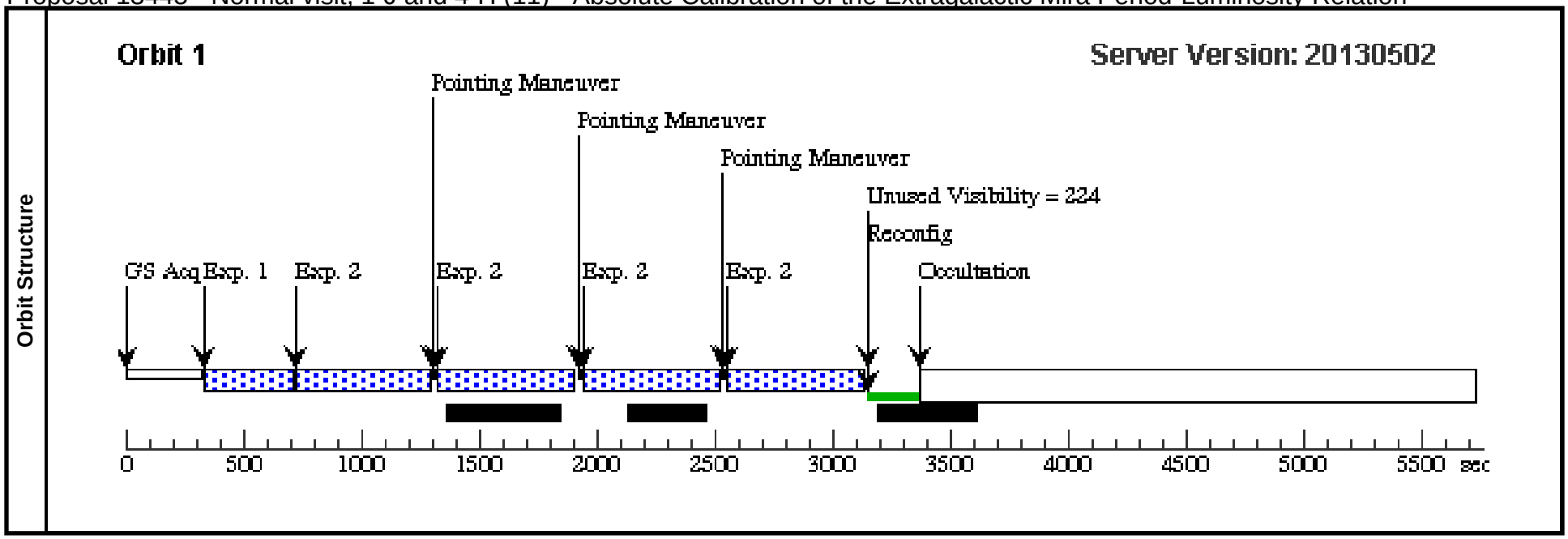
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	1 J exposure	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=8; SAMP-SEQ=SPARS50	GS ACQ SCENARIO BASE1B3		352.935448 Secs (352.935 Secs) *[==>]*	*[1]*
2	4 H exposures	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in Normal visit, 1-J and 4-H (11) (1)	552.937252 Secs (2211.749 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	*[1]*


Orbit Structure
Orbit 1
Server Version: 20130502
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Unused Visibility = 224
Reconfig
GS Acq
Exp. 1
Exp. 2
Exp. 2
Exp. 2
Exp. 2
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 13445, Normal visit, 1-J and 4-H (12), implementation Fri Jul 12 00:47:29 GMT 2013

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: AFTER 11 BY 27 D TO 31 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(2)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	NGC4258	RA: 12 18 47.5140 (184.6979750d) Dec: +47 20 20.25 (47.33896d) Equinox: J2000		V=26+/-2	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	1 J exposure	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F125W	NSAMP=8; SAMP-SEQ=SPARS50	GS ACQ SCENARIO BASE1B3		352.935448 Secs (352.935 Secs) *[==>]*	 ***[1]***
2	4 H exposures	(1) NGC4258	WFC3/IR, MULTIACCUM, IR-FIX	F160W	NSAMP=12; SAMP-SEQ=SPARS50		Pattern 1, Exps 2-2 in Normal visit, 1-J and 4-H (12) (1)	552.937252 Secs (2211.749 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	 ***[1]***

Orbit Structure