14348 - Polarimetry of ASASSN-15lh as a probe of explosion physics of the most luminous supernova ever discovered

Cycle: 22, Proposal Category: GO/DD

(Availability Mode: AVAILABLE)

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) ASASSN-2015LH	ACS/WFC	3	30-Jul-2015 21:29:28.0	yes
A1	BIAS	ACS/WFC	1	30-Jul-2015 21:29:31.0	yes
A2	BIAS	ACS/WFC	1	30-Jul-2015 21:29:32.0	yes
A3	BIAS	ACS/WFC	1	30-Jul-2015 21:29:32.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
A4	BIAS	ACS/WFC	1	30-Jul-2015 21:29:33.0	yes

7 Total Orbits Used

ABSTRACT

Barring any viewing-angle dependencies, ASASSN-2015lh is the most superluminous supernova (SLSN) ever observed. An important key to the understanding of any type of object is its shape. At redshift 0.23, this rare event is still within reach of the imaging polarimetric capabilities of HST, even at relatively late epochs. Linear continuum polarization measured to 0.5% will yield deviations from sphericity at the 5% level. Observations at multiple epochs will probe the disintegrating star at increasing geometric depth and ultimately enable causal physical processes such as massive-star core-collapse and disruption of a star by a black hole to be decisively tensioned against each other. Interstellar foreground polarization can be subtracted as the remaining signal after the light curve has faded to the background level. Any polarization by circumstellar matter can be identified by its dependency on wavelength, time, and angle and may contribute critical information about the progenitor and late phases of its evolution.

OBSERVING DESCRIPTION

This program attempts to acquire imaging polarization of ASASSN-2015lh using ACS/WFC. We intend to observe at one epoch at around early August 2015. The polarization data will be observed in three filters: F435W, F606W, and F775W. For F606W and F775W, each filter three polarizers POL0V, POL120V, and POL60V are used to aqcuire a complete polarization data set. For F435W, the POLOUV, POL120UV, AND POL60UV will be used. Multiple exposures are required for cosmic ray rejection.

CALIBRATION ORBITS: As per STScI policy, 4 internal orbits have been added to this proposal for the purpose of obtaining subarray bias frames that are contemporaneous with the science observations. These internal orbits will be charged to STScI's Cycle 22 ACS Calibration Program, not to GO 14348. The ACS Instrument Team at STScI is responsible for producing superbias reference files from the bias frames obtained in this GO proposal.

Visit

Proposal 14348, Visit 01, scheduled Fri Jul 31 01:29:34 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.28 Angle Between Sides= Center Pattern=false		(1), (2), (3), (4), (5), (6), (7), (8), (9)

Fixed Targets

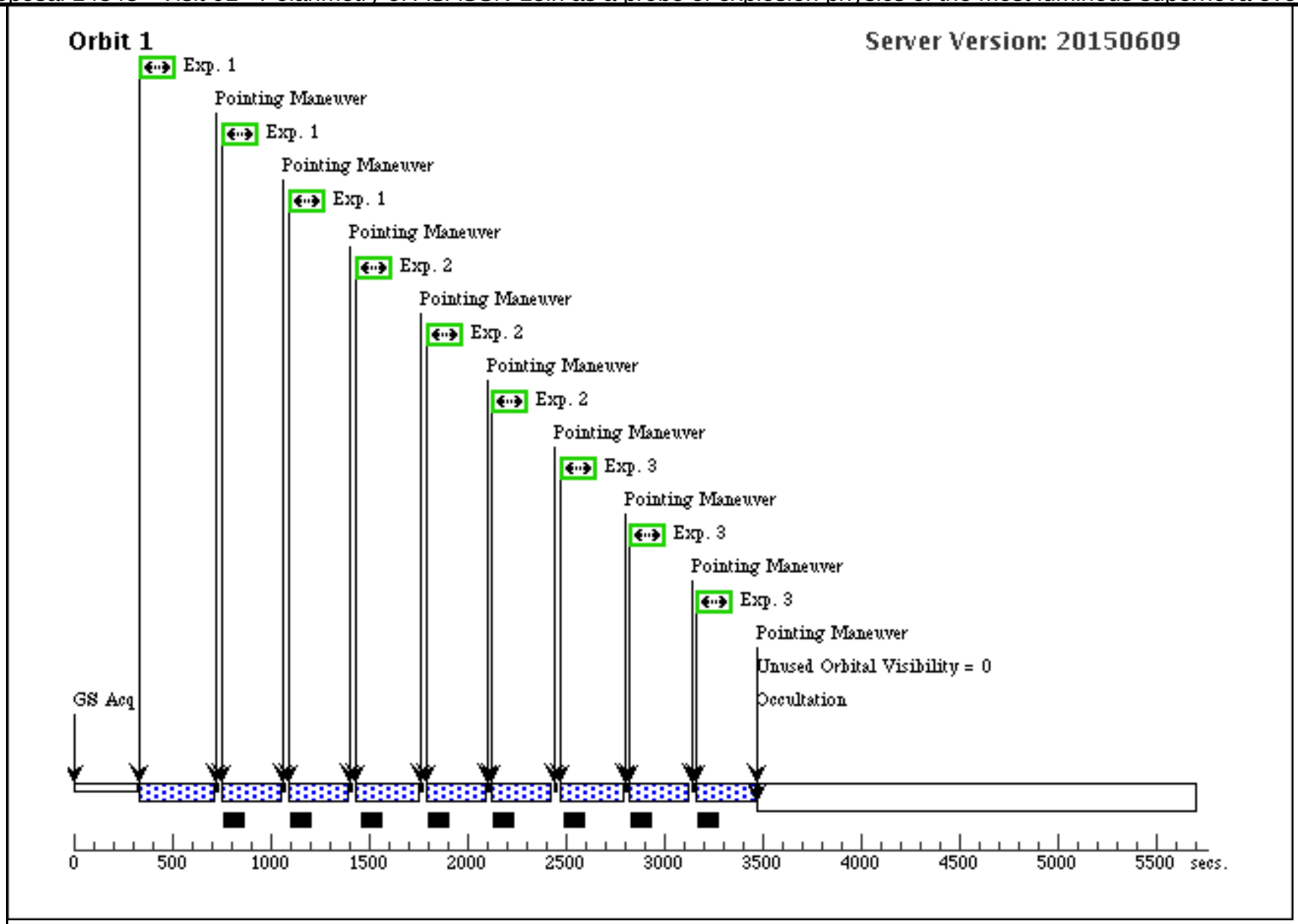
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	ASASSN-2015LH	RA: 22 02 15.4500 (330.5643750d) Dec: -61 39 34.64 (-61.65962d) Equinox: J2000	Proper Motion RA: 0 mas/yr Proper Motion Dec: 0 Epoch of Position: 2000	V=18.0+/-0.5	Reference Frame: ICRS

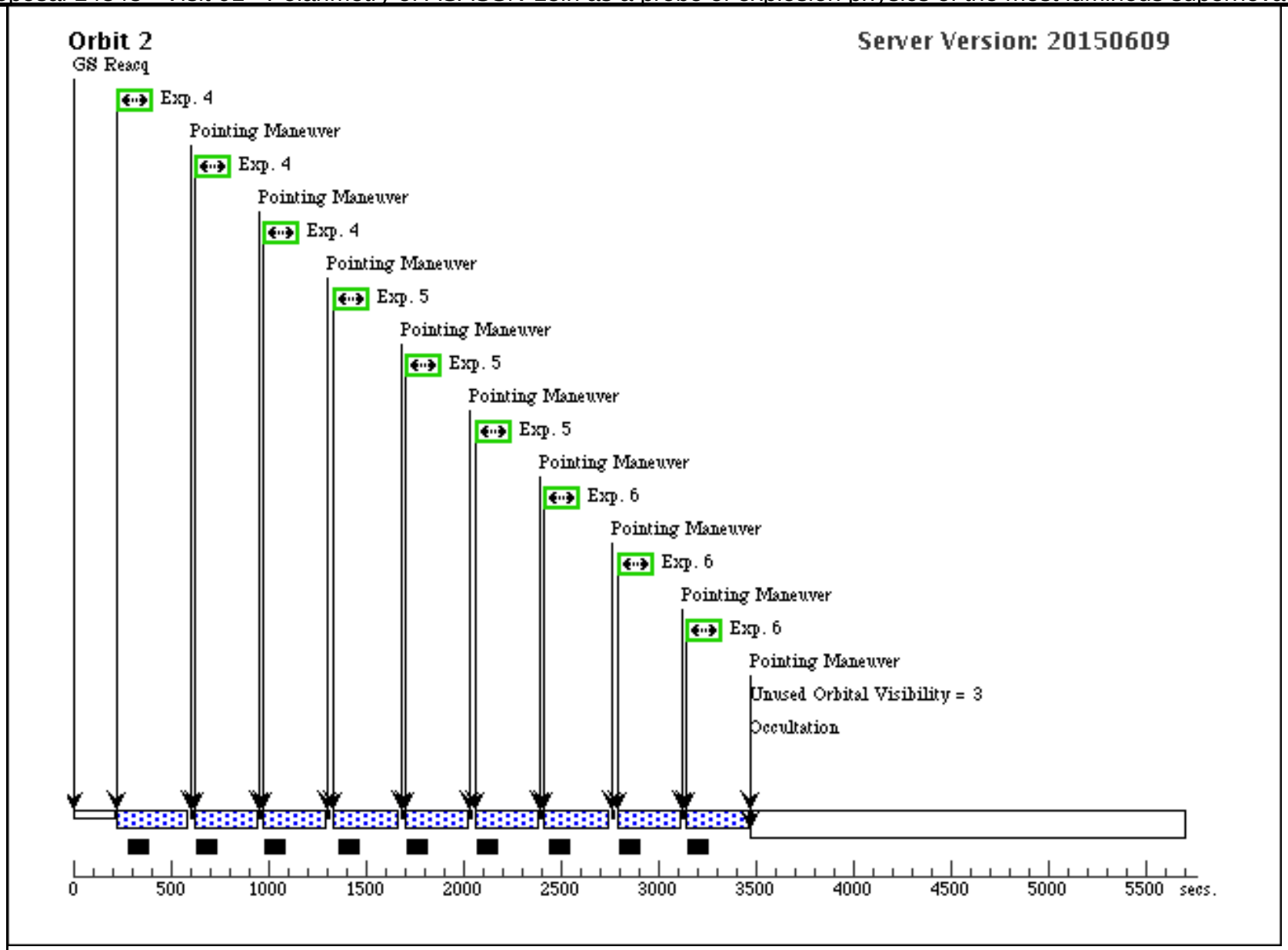
Comments: Extended=NO

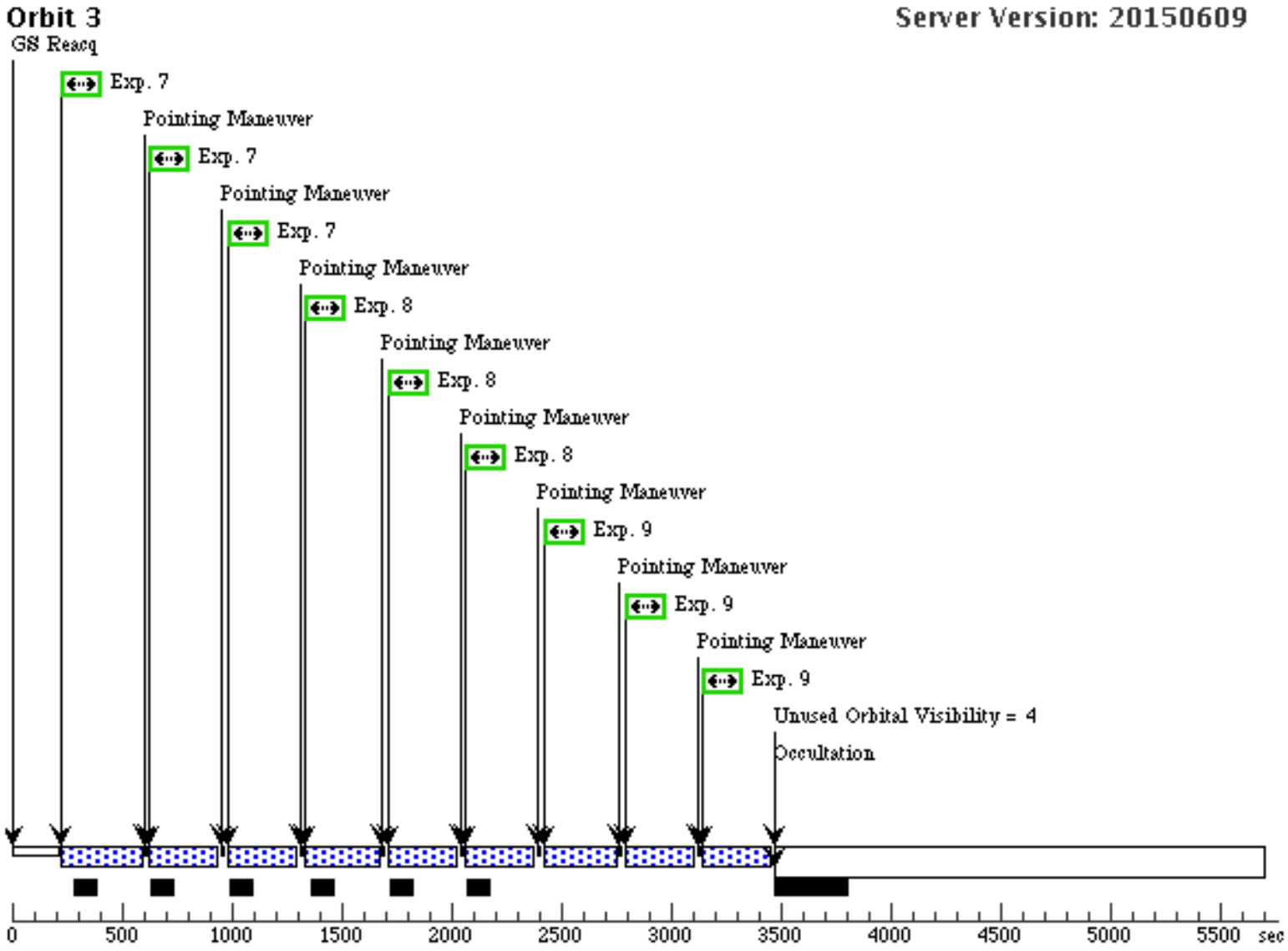
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F606 @ 0	(1) ASASSN-2015LH	ACS/WFC, ACCUM, WFC1	F606W POL0V			Pattern 1, Exps 1-1 in Visit 01 (1)	122 Secs (366 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2	F606 @ 120	(1) ASASSN-2015LH	ACS/WFC, ACCUM, WFC1	F606W POL120V			Pattern 1, Exps 2-2 in Visit 01 (1)	122 Secs (366 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
3	F606 @ 60	(1) ASASSN-2015LH	ACS/WFC, ACCUM, WFC1	F606W POL60V			Pattern 1, Exps 3-3 in Visit 01 (1)	122 Secs (366 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
4	F435 @ 0	(1) ASASSN-2015LH	ACS/WFC, ACCUM, WFC1	F435W POL0UV			Pattern 1, Exps 4-4 in Visit 01 (1)	138 Secs (414 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
5	F435 @ 120	(1) ASASSN-2015LH	ACS/WFC, ACCUM, WFC1	F435W POL120UV			Pattern 1, Exps 5-5 in Visit 01 (1)	138 Secs (414 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
6	F435 @ 60	(1) ASASSN-2015LH	ACS/WFC, ACCUM, WFC1	F435W POL60UV			Pattern 1, Exps 6-6 in Visit 01 (1)	138 Secs (414 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[2]***
7	F775 @ 0	(1) ASASSN-2015LH	ACS/WFC, ACCUM, WFC1	F775W POL0V			Pattern 1, Exps 7-7 in Visit 01 (1)	137 Secs (411 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[3]***
8	F775 @ 120	(1) ASASSN-2015LH	ACS/WFC, ACCUM, WFC1	F775W POL120V			Pattern 1, Exps 8-8 in Visit 01 (1)	137 Secs (411 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[3]***
9	F775 @ 60	(1) ASASSN-2015LH	ACS/WFC, ACCUM, WFC1	F775W POL60V			Pattern 1, Exps 9-9 in Visit 01 (1)	137 Secs (411 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[3]***

Orbit Structure




Orbit 2
Server Version: 20150609
GS Reacq
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 4
Pointing Maneuver
Exp. 5
Pointing Maneuver
Exp. 5
Pointing Maneuver
Exp. 5
Pointing Maneuver
Exp. 6
Pointing Maneuver
Exp. 6
Pointing Maneuver
Exp. 6
Pointing Maneuver
Unused Orbital Visibility = 3
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.


Orbit 3
Server Version: 20150609
GS Reacq
Exp. 7
Pointing Maneuver
Exp. 7
Pointing Maneuver
Exp. 7
Pointing Maneuver
Exp. 8
Pointing Maneuver
Exp. 8
Pointing Maneuver
Exp. 8
Pointing Maneuver
Exp. 9
Pointing Maneuver
Exp. 9
Pointing Maneuver
Exp. 9
Unused Orbital Visibility = 4
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14348, Bias Frames for Visit 01 (A1), implementation Fri Jul 31 01:29:35 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

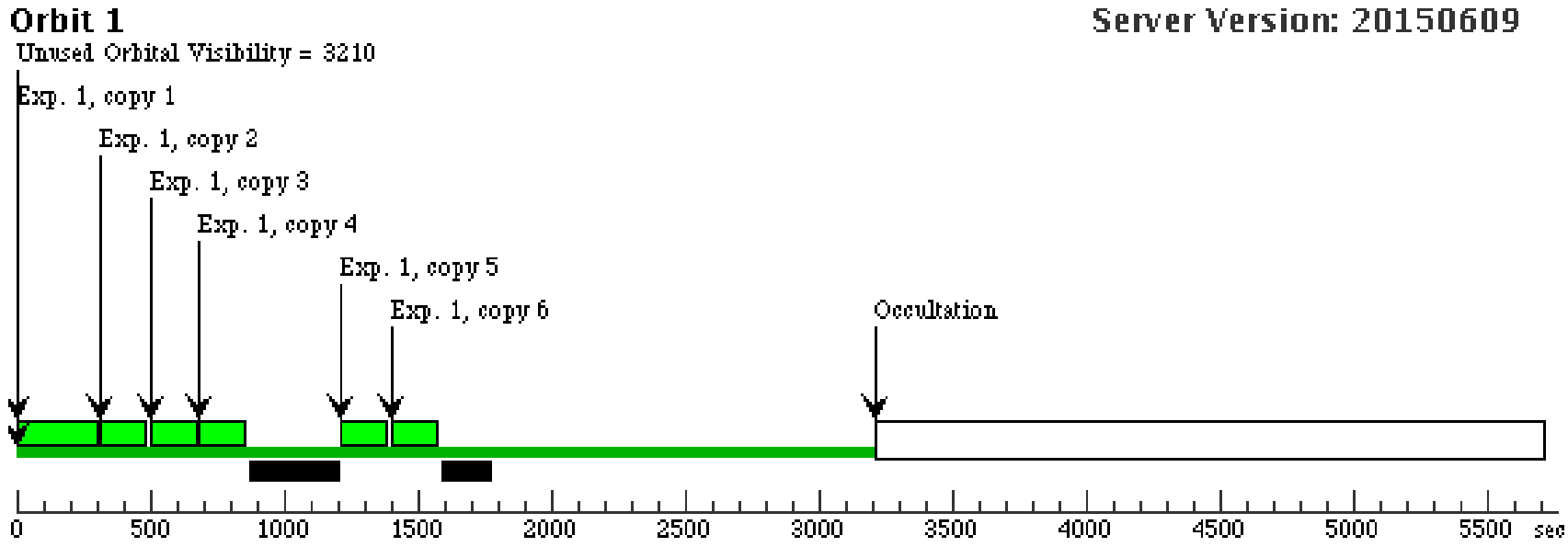
Special Requirements: SEQ A1,A2,A3,A4 WITHIN 1 D

Comments: This internal orbit will be charged to the Cycle 22 ACS Subarray Bias Calibration Program. Avoid SAA passages; SAA-impacted orbits are usable.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		BIAS	ACS/WFC, ACCUM, WFC1-2K	DEF	GAIN=2.0; COMPRESSION=NONE			0 Secs X 6 (0 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]*	***[1]***

Orbit Structure



Visit

Proposal 14348, Bias Frames for Visit 01 (A2), implementation Fri Jul 31 01:29:35 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

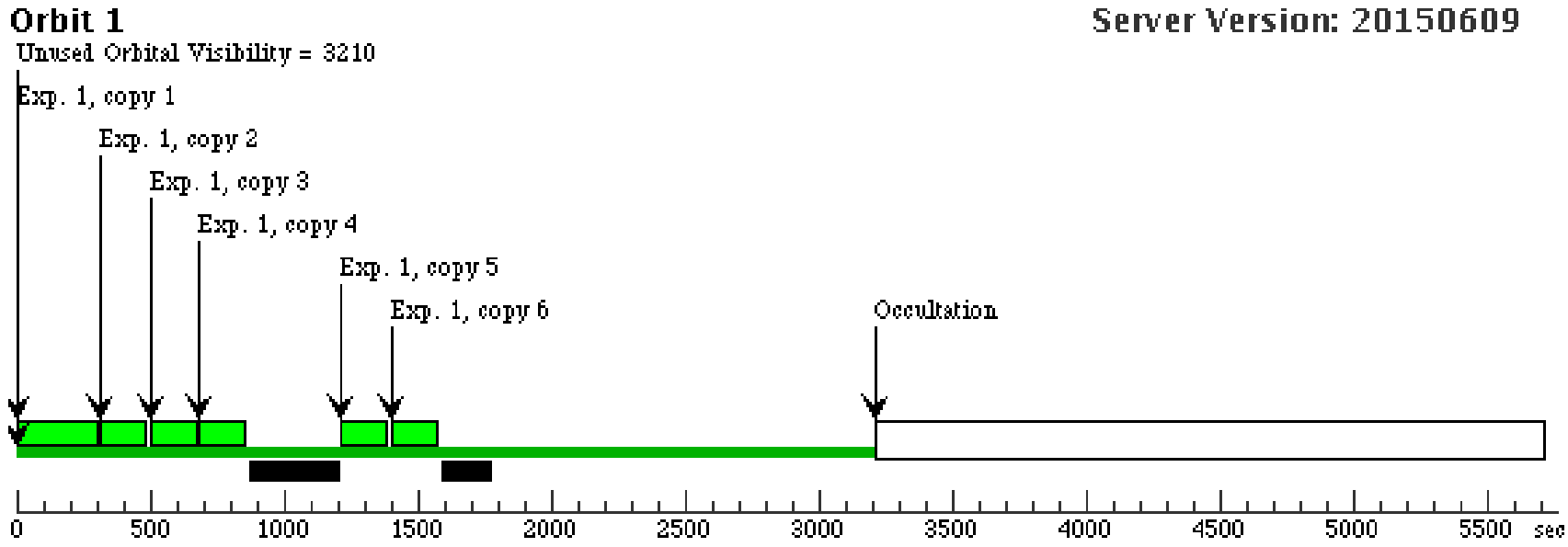
Special Requirements: (none)

Comments: This internal orbit will be charged to the Cycle 22 ACS Subarray Bias Calibration Program. Avoid SAA passages; SAA-impacted orbits are usable.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		BIAS	ACS/WFC, ACCUM, WFC1-2K	DEF	GAIN=2.0; COMPRESSION=NONE			0 Secs X 6 (0 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]*	***[1]***

Orbit Structure



Visit

Proposal 14348, Bias Frames for Visit 01 (A3), implementation Fri Jul 31 01:29:35 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

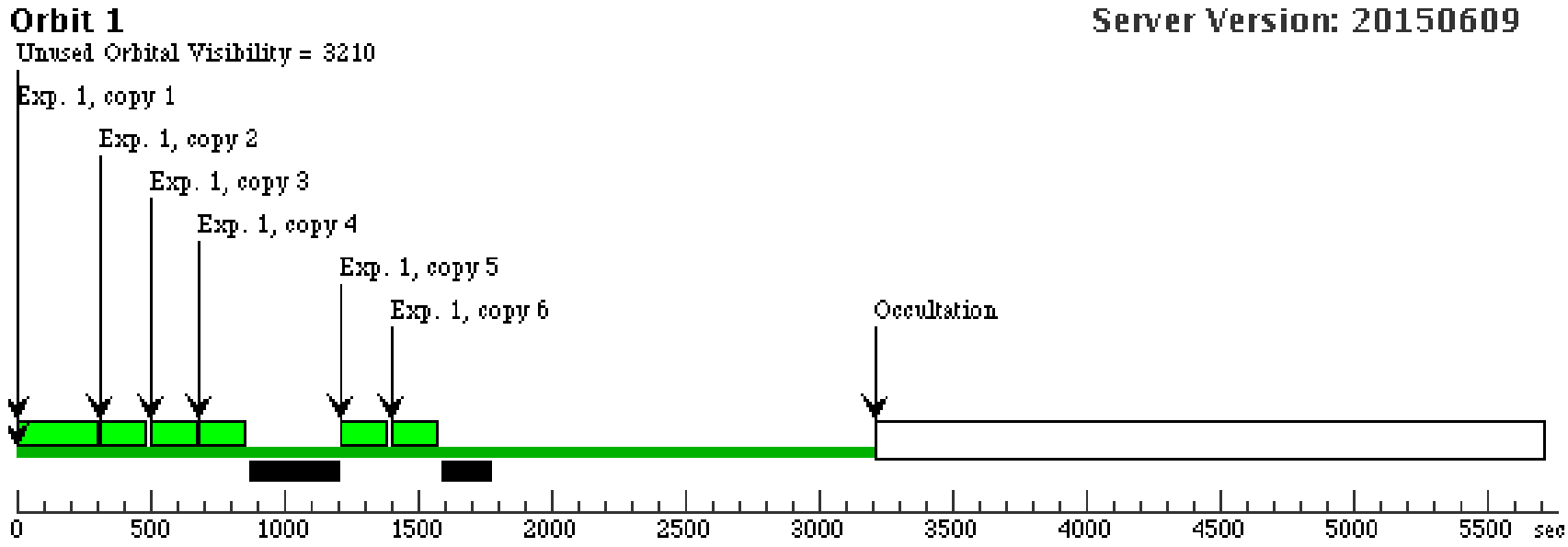
Special Requirements: (none)

Comments: This internal orbit will be charged to the Cycle 22 ACS Subarray Bias Calibration Program. Avoid SAA passages; SAA-impacted orbits are usable.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		BIAS	ACS/WFC, ACCUM, WFC1-2K	DEF	GAIN=2.0; COMPRESSION=NONE			0 Secs X 6 (0 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]*	***[1]***

Orbit Structure



Visit

Proposal 14348, Bias Frames for Visit 01 (A4), implementation Fri Jul 31 01:29:35 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/WFC

Special Requirements: GROUP A4,01 WITHIN 14D

Comments: This internal orbit will be charged to the Cycle 22 ACS Subarray Bias Calibration Program. Avoid SAA passages; SAA-impacted orbits are usable.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		BIAS	ACS/WFC, ACCUM, WFC1-2K	DEF	GAIN=2.0; COMPRESSION=NONE			0 Secs X 6 (0 Secs) *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]* *[==>(Copy 4)]* *[==>(Copy 5)]* *[==>(Copy 6)]*	***[1]***

Orbit Structure