14248 - Studying Dual AGN Activity in the Final Merger Stage

Cycle: 23, 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) CGCG341-006	STIS/CCD	2	23-Jul-2015 23:18:55.0	yes
02	(3) 2MASXJ01392400+2924067 CCDFLAT	STIS/CCD	2	23-Jul-2015 23:18:58.0	yes
03	(4) 2MASXJ08434495+3549421	STIS/CCD	2	23-Jul-2015 23:19:00.0	yes
04	(5) MCG+02-21-013	STIS/CCD	2	23-Jul-2015 23:19:02.0	yes

8 Total Orbits Used

ABSTRACT

During the process of merging, close dual AGN, with two growing SMBHs hosted by a pair of merging galaxies, are predicted. Simulations further suggest that the highest levels of merger induced dual AGN activity occur on kpc scales where the high resolution of HST is required. While the theoretical model is clear, recent observational studies testing the merger driven AGN model have dramatically different scenarios and contradictory

results. We have recently found a very high fraction of narrow line BAT detected QSOs (21%) showing hidden mergers (< 3 kpc) only visible in adaptive optics. We propose HST STIS spectroscopic observations of a sample of four very close mergers (0.2-1.9 kpc) to study dual AGN triggering in this final stage of galaxy mergers. Our goals are to 1) confirm the nuclei as dual AGN and 2) measure the kinematics and ionization with high resolution along the slit to understand the merger. These observations will form part of a well-characterized legacy study of all 57 X-ray selected nearby AGN from the sky Swift-BAT in close major mergers (<30 kpc, z<0.075).

OBSERVING DESCRIPTION

Using adaptive optics we have identified a sample of very small separation mergers that are hidden to ground based imaging. We propose to use the high spatial resolution of HST along with STIS spectroscopy to measure emission lines in the two nuclei to 1) confirm the nuclei as dual AGN using emission line diagnostics or high ionization lines (e.g. Ne V) and 2) measure the kinematics and ionization with to understand the merger. We will use setups to cover the two emission line complexes (G430L for OIII/Hbeta and G750M for NII/Halpha). The orientation of the slit is chosen to cover the two nuclei.

Our program requires specific slit orientations (ORIENT) which affects the scheduling. The slit is quite tightly constrained in order to capture the centroid of both galaxies +/-1 degrees. The tolerance is set by our desire for nuclear spectra of both galaxy nuclei.

The angular separation of the two nuclei is between (at minimum 0.32" for MCG-02-21-013 and at maximum 2.72" for 2MASXJ0843).

Most of the sources can be done in a single setup in 750M to cover all the emission lines, however, 2MAS0139 is at a somewhat higher redshift that requires two setups.

We have chosen to do a 2 step dither and CR-split 2 for all observations because of the limit of 2 orbits.

Visit

Proposal 14248, CGCG341-006 (01) Fri Jul 24 03:19:04 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 0.0D TO 1.9 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2), (3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.15	Center Pattern=false		
	Line Spacing=			

Fixed Targets

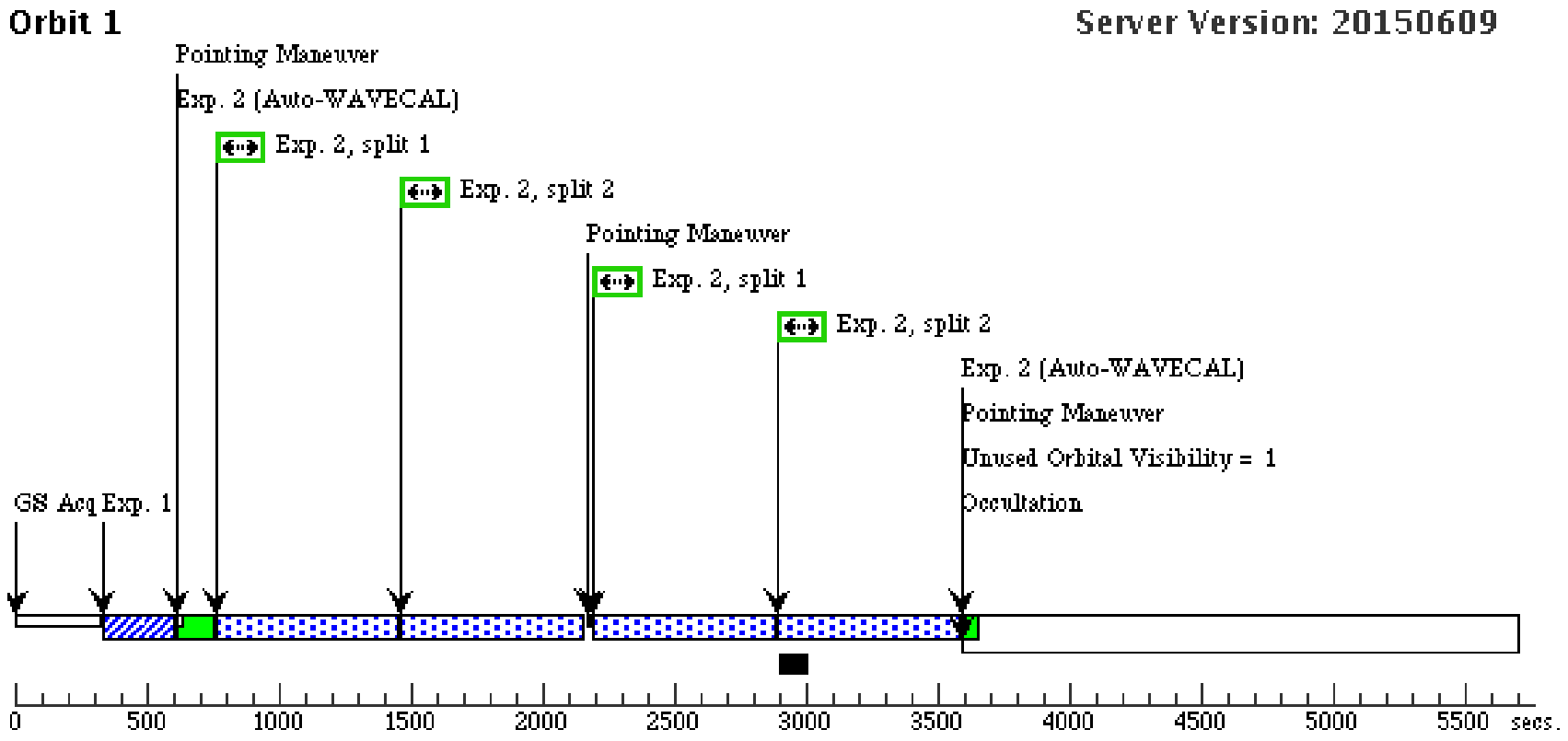
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	CGCG341-006	RA: 18 45 26.2870 (281.3595292d)		V=(?)	Reference Frame: ICRS
		Dec: +72 11 0.83 (72.18356d)		J=12.989	
		Equinox: J2000			

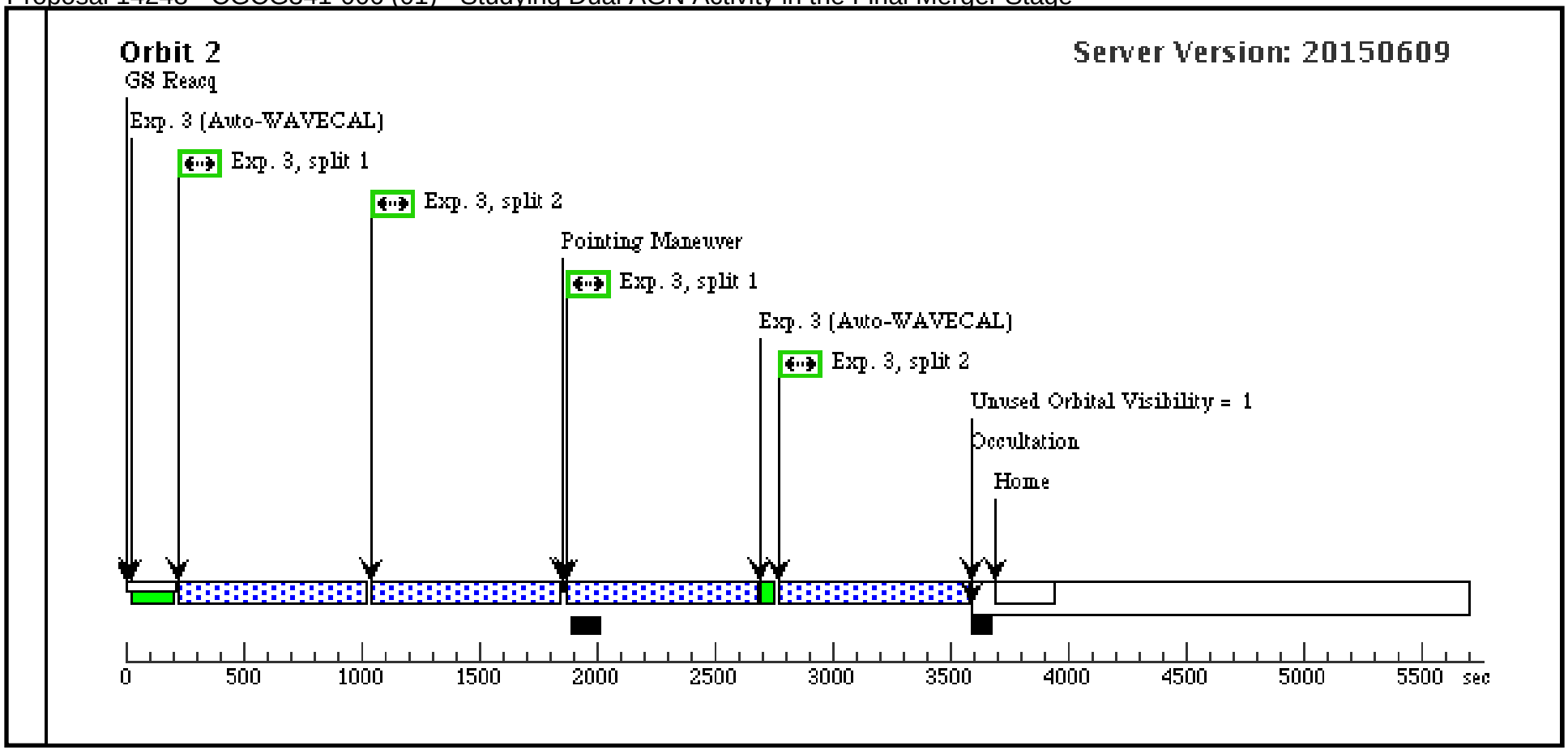
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) CGCG341-006	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			10 Secs (10 Secs)	
								[==>]	***[1]***
2		(1) CGCG341-006	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in CGCG341-006 (01) (1)	1310 Secs (2620 Secs)	
								[==>(Pattern 1, Split 1)] *[==>(Pattern 1, Split 2)]* *[==>(Pattern 2, Split 1)]* *[==>(Pattern 2, Split 2)]*	***[1]***
3		(1) CGCG341-006	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=2		Pattern 1, Exps 3-3 in CGCG341-006 (01) (1)	1610 Secs (3084 Secs)	
								[==>771.0 Secs (Pattern 1, Split 1)] *[==>771.0 Secs (Pattern 1, Split 2)]* *[==>771.0 Secs (Pattern 2, Split 1)]* *[==>771.0 Secs (Pattern 2, Split 2)]*	***[2]***

Orbit Structure




Orbit 2
Server Version: 20150609
GS Reacq
Exp. 3 (Auto-WAVECAL)
Exp. 3, split 1
Exp. 3, split 2
Pointing Maneuver
Exp. 3, split 1
Exp. 3 (Auto-WAVECAL)
Exp. 3, split 2
Unused Orbital Visibility = 1
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14248, 2MASXJ0139 (02) Fri Jul 24 03:19:04 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 49.8D TO 51.8 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2), (3), (4)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.15	Center Pattern=false		
	Line Spacing=			

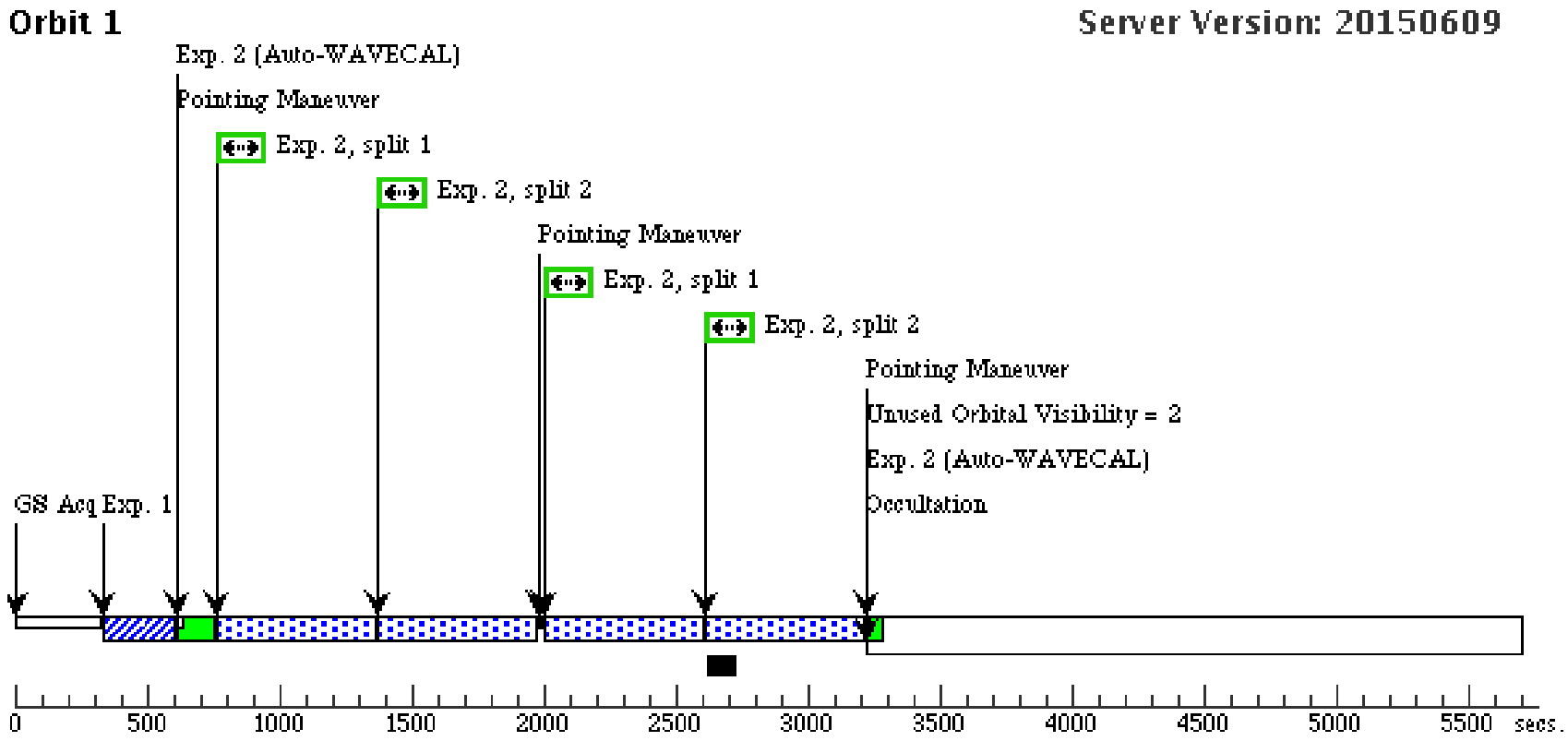
Fixed Targets

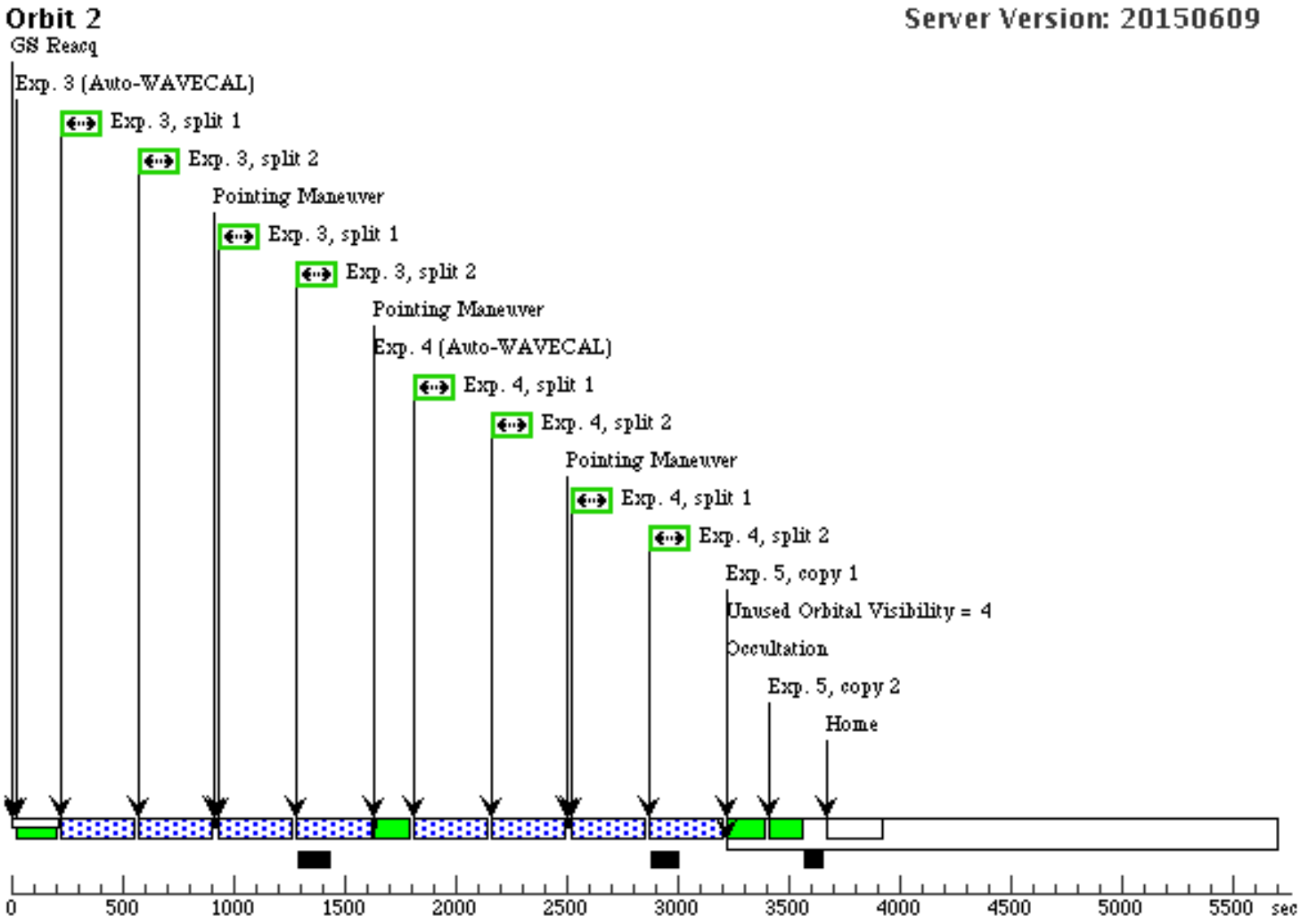
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	2MASXJ01392400+2924067	RA: 01 39 24.0010 (24.8500042d) Dec: +29 24 6.75 (29.40187d) Equinox: J2000		V=(?) J=12.714	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) 2MASXJ01392400+2924067	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			10 Secs (10 Secs) *[==>]*	***[1]***
2		(3) 2MASXJ01392400+2924067	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in 2MASXJ0139 (02) (1)	1310 Secs (2252 Secs) *[==>563.0 Secs (Pattern 1, Split 1)]* *[==>563.0 Secs (Pattern 1, Split 2)]* *[==>563.0 Secs (Pattern 2, Split 1)]* *[==>563.0 Secs (Pattern 2, Split 2)]*	***[1]***
3		(3) 2MASXJ01392400+2924067	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=2		Pattern 1, Exps 3-3 in 2MASXJ0139 (02) (1)	800 Secs (1204 Secs) *[==>301.0 Secs (Pattern 1, Split 1)]* *[==>301.0 Secs (Pattern 1, Split 2)]* *[==>301.0 Secs (Pattern 2, Split 1)]* *[==>301.0 Secs (Pattern 2, Split 2)]*	***[2]***
4		(3) 2MASXJ01392400+2924067	STIS/CCD, ACCUM, 52X0.2E1	G750M 7283 A	CR-SPLIT=2		Pattern 1, Exps 4-4 in 2MASXJ0139 (02) (1)	800 Secs (1204 Secs) *[==>301.0 Secs (Pattern 1, Split 1)]* *[==>301.0 Secs (Pattern 1, Split 2)]* *[==>301.0 Secs (Pattern 2, Split 1)]* *[==>301.0 Secs (Pattern 2, Split 2)]*	***[2]***
5		CCDFLAT	STIS/CCD, ACCUM, 52X0.1	G750M 7283 A				*[==>(Copy 1)]* *[==>(Copy 2)]*	***[2]***

Orbit Structure




Orbit 2
Server Version: 20150609
GS Reacq
Exp. 3 (Auto-WAVECAL)
Exp. 3, split 1
Exp. 3, split 2
Pointing Maneuver
Exp. 3, split 1
Exp. 3, split 2
Pointing Maneuver
Exp. 4 (Auto-WAVECAL)
Exp. 4, split 1
Exp. 4, split 2
Pointing Maneuver
Exp. 4, split 1
Exp. 4, split 2
Exp. 5, copy 1
Unused Orbital Visibility = 4
Occultation
Exp. 5, copy 2
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14248, 2MASXJ0843 (03) Fri Jul 24 03:19:04 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 137D TO 139 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2), (3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.15	Center Pattern=false		
	Line Spacing=			

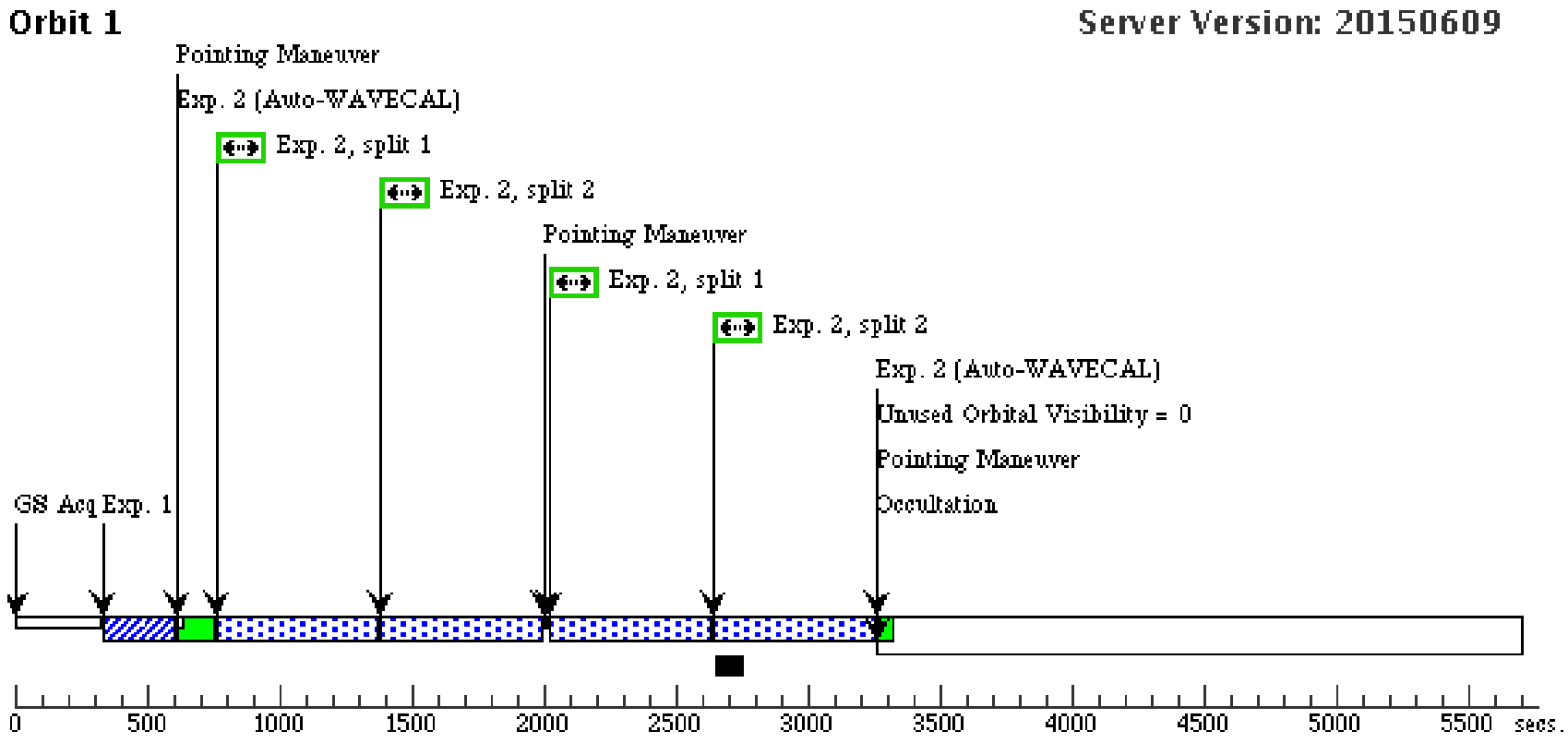
Fixed Targets

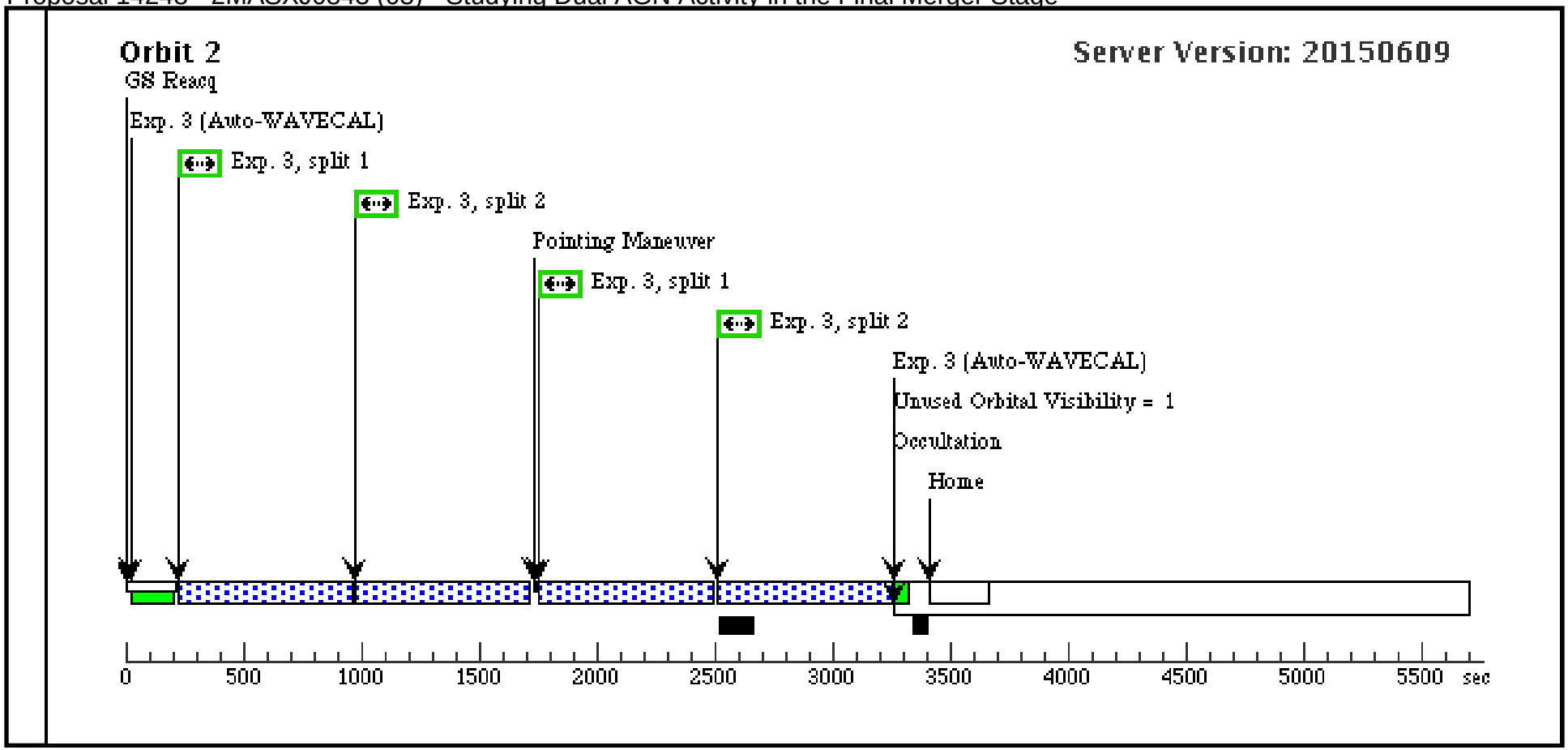
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	2MASXJ08434495+3549421	RA: 08 43 44.9880 (130.9374500d) Dec: +35 49 42.07 (35.82835d) Equinox: J2000		V=15.6	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) 2MASXJ08434495+3549421	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			10 Secs (10 Secs)	
								[==>]	***[1]***
2		(4) 2MASXJ08434495+3549421	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in 2MASXJ0843 (03) (1)	1310 Secs (2292 Secs)	
								[==>573.0 Secs (Pattern 1, Split 1)] *[==>573.0 Secs (Pattern 1, Split 2)]* *[==>573.0 Secs (Pattern 2, Split 1)]* *[==>573.0 Secs (Pattern 2, Split 2)]*	***[1]***
3		(4) 2MASXJ08434495+3549421	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=2		Pattern 1, Exps 3-3 in 2MASXJ0843 (03) (1)	1610 Secs (2836 Secs)	
								[==>709.0 Secs (Pattern 1, Split 1)] *[==>709.0 Secs (Pattern 1, Split 2)]* *[==>709.0 Secs (Pattern 2, Split 1)]* *[==>709.0 Secs (Pattern 2, Split 2)]*	***[2]***

Orbit Structure




Orbit 2
Server Version: 20150609
GS Reacq
Exp. 3 (Auto-WAVECAL)
Exp. 3, split 1
Exp. 3, split 2
Pointing Maneuver
Exp. 3, split 1
Exp. 3, split 2
Exp. 3 (Auto-WAVECAL)
Unused Orbital Visibility = 1
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14248, MCG+02-21-013 (04) Fri Jul 24 03:19:04 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 51.3D TO 53.3 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2), (3)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.15	Center Pattern=false		
	Line Spacing=			

Fixed Targets

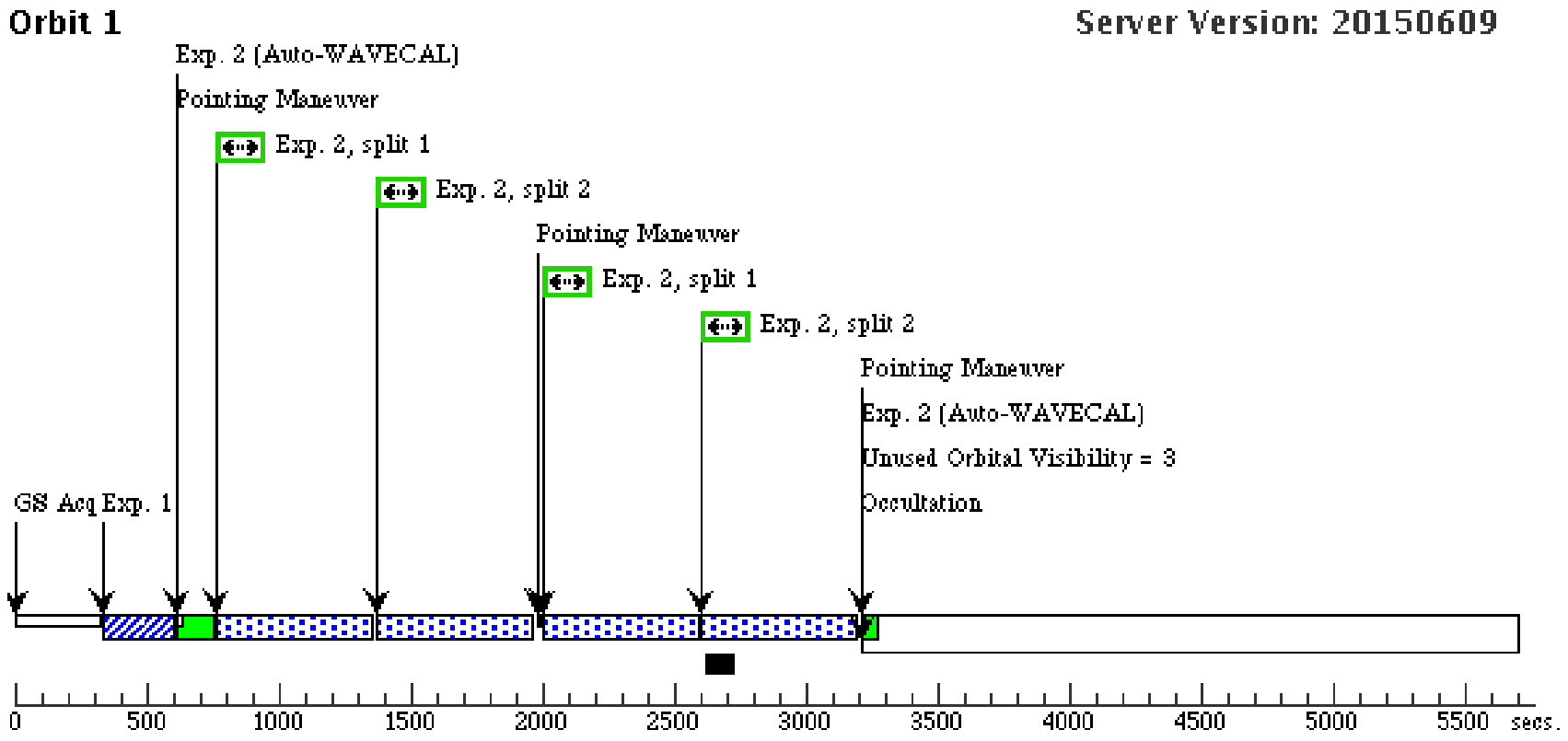
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	MCG+02-21-013	RA: 08 04 46.3620 (121.1931750d) Dec: +10 46 36.35 (10.77676d) Equinox: J2000		V=14.4	Reference Frame: ICRS

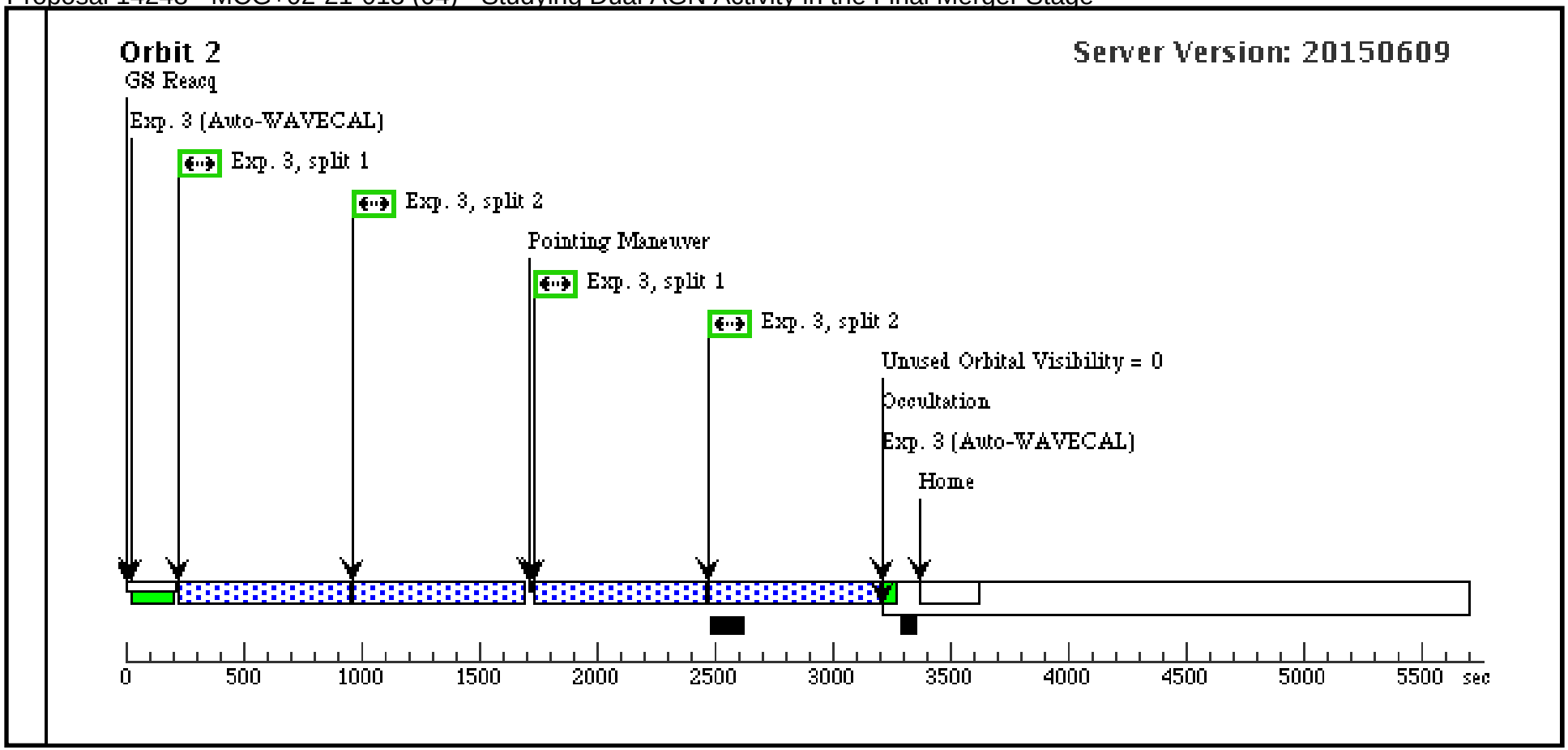
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(5) MCG+02-21-013	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			10 Secs (10 Secs)	
								[==>]	***[1]***
2		(5) MCG+02-21-013	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in MCG+02-21-013 (04) (1)	1310 Secs (2240 Secs)	
								[==>560.0 Secs (Pattern 1, Split 1)] *[==>560.0 Secs (Pattern 1, Split 2)]* *[==>560.0 Secs (Pattern 2, Split 1)]* *[==>560.0 Secs (Pattern 2, Split 2)]*	***[1]***
3		(5) MCG+02-21-013	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=2		Pattern 1, Exps 3-3 in MCG+02-21-013 (04) (1)	1610 Secs (2788 Secs)	
								[==>697.0 Secs (Pattern 1, Split 1)] *[==>697.0 Secs (Pattern 1, Split 2)]* *[==>697.0 Secs (Pattern 2, Split 1)]* *[==>697.0 Secs (Pattern 2, Split 2)]*	***[2]***

Orbit Structure




Orbit 2
Server Version: 20150609
GS Reacq
Exp. 3 (Auto-WAVECAL)
Exp. 3, split 1
Exp. 3, split 2
Pointing Maneuver
Exp. 3, split 1
Exp. 3, split 2
Unused Orbital Visibility = 0
Occultation
Exp. 3 (Auto-WAVECAL)
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec