14125 - A Remarkable Recurrent Nova in M31: The Leading Single Degenerate Supernova Ia Progenitor Candidate(?)

Cycle: 23, Proposal Category: GO

(UV Initiative)

(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) M31N-2008-12A (2) AQUSTAR	STIS/CCD STIS/FUV-MAMA	4	29-Aug-2015 21:03:11.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
02	(1) M31N-2008-12A (2) AQUSTAR	STIS/CCD STIS/NUV-MAMA	2	29-Aug-2015 21:03:13.0	yes
03	(1) M31N-2008-12A (2) AQUSTAR	STIS/CCD STIS/NUV-MAMA	2	29-Aug-2015 21:03:14.0	yes
04	(1) M31N-2008-12A	WFC3/UVIS	3	29-Aug-2015 21:03:16.0	yes
05	(1) M31N-2008-12A	WFC3/UVIS	3	29-Aug-2015 21:03:18.0	yes
06	(1) M31N-2008-12A	WFC3/UVIS	3	29-Aug-2015 21:03:20.0	yes
07	(1) M31N-2008-12A	WFC3/UVIS	3	29-Aug-2015 21:03:22.0	yes

20 Total Orbits Used

ABSTRACT

M31N 2008-12a is the single most important nova system in M31. With its one-year recurrence period, high-mass white dwarf, high mass accretion rate, low peak optical luminosity, and low ejecta mass and velocity, this system is a leading Supernova Type Ia single-degenerate progenitor candidate. The rapid decline from optical peak and the distance of M31 necessitate a request for disruptive target of opportunity observations. Here we propose early eruption UV spectroscopic observations, followed by UV and optical photometric monitoring during the super soft source phase; providing true panchromatic coverage, then continuing into the subsequent decline. Spectroscopically we will study the composition of the ejecta, including probing the underlying composition of the white dwarf, C-O vs. O-Ne, which is key to the ultimate fate of this system (SNIa vs. accretion-induced collapse), as well as the emission mechanisms in the ejecta exploring evidence for a long lived stellar wind. Photometrically, we will monitor the decline towards quiescence, disentangling NUV contributions from the cooling white dwarf and perhaps the surviving accretion disk. The regularity of eruptions of M31N 2008-12a are unprecedented and this is the only thermonuclear nova system where we can accurately predict eruptions. The unique UV capabilities of HST therefore allow us to study the physics of this vitally important system even at the great distance of M31.

OBSERVING DESCRIPTION

STIS Spectroscopy: The spectroscopic observations proposed here are to obtain the early FUV and NUV eruption spectra of the extragalactic recurrent nova M31N 2008-12a, with the science goals of determining the white dwarf composition, computing ejecta abundances, exploring

continuum emission mechanisms, and extinction measurement. As such, the proposed observations require a good SNR in the continuum and expected emission lines.

Using the STIS FUV MAMA G140L (1,150-1,737 Ang) and NUV MAMA G230L (1,570-3,180 Ang) gratings with the 52"x0.2" slit, we will obtain coverage of the entire wavelength range from 1,150-3,180 Ang, which is required, for e.g., to maximize the available lines for abundance calculations and to determine the continuum level.

The 0.2" slit width provides a good compromise between resolution and throughput, allowing accurate absorption line measurements in the continuum. Additionally, the low-resolution gratings selected generally provided the best throughput across the entire wavelength range.

MAMA safety: Using the STIS ETC and values for the expected peak luminosity of M31N 2008-12a we do not approach the bright object limits for the STIS MAMA detectors. There are also no bright UV sources within the nearby field that are expected to cause problems with the observation.

STIS target acquisition: The area around M31N 2008-12a is relatively un-crowded in the U-band and NUV, and even at the quiescence luminosity of M31N 2008-12a, the nearest brighter source is 3.5" away. There are however several bright optical sources in the FOV and as such we will be using a bright star (HSTID=NBW9014542, B=19.162, V=18.349, R=17.876, I=17.358) to acquire the nova FOV and then slew to the nova position. Since we do not know the spectral type of the acquisition star, the acquisition time was calculated using the appropriate ETC and a range of spectral types (the worst case spectral type is still safe to observe under this strategy). Acquisition will be made using the recommended F28X50LP aperture and our acquisition object is faint enough for its use.

Exposure time calculations: Based on the estimated orbital visibility (55 mins) and various Galactic nova simulations, we require four HST orbits for each grating to allow us to achieve suitable SNRs for the continuum (> 5 for the majority of the NUV and FUV continuum) and selected emission lines. As there is a limitation on the number of consecutive orbits employing MAMA instruments, the FUV and NUV observations have been split into two separate visits, with the FUV visit occurring first (due to the lower throughput) and the NUV visit taking place at the earliest opportunity there after. As such we have placed a timing requirement of up to one day after the G140L observations for the G230L.

STIS Dithering: In order to remove detector defect and hot pixels a 4 point STIS-ALONG-SLIT dither pattern for both NUV and FUV observations has been applied with a 7 pixel point spacing in each to allow for an improved spatial resolution.

STIS TIME-TAG MODE: Using the ETC and expected values for the peak luminosity of the nova we have determined a total global count rate significantly below 20,000 c/s. We therefore wish to observe in the Time-tag mode for archival purposes and preservation of data. Buffer time for this mode has been calculated as 1/2 the exposure time for each observation.

WFC3 imaging: After the initial spectroscopic observations we then wish to obtain NUV (F225W, F275W) and optical (F336W, F475W, and F814W) imaging of the nova at a time when its SSS phase is at maximum (day 10-14), turns off (day 17-19), and then during the decline of the nova (day 24-26 and 31-34), allowing the production of a panchromatic SED during these times. Such observations will be taken using UVIS on WFC3 due to the superior NUV capabilities of this instrument.

As the time-scale of the NUV and optical light curve development post day ~6 is un-known, our photometry time request is based upon obtaining a good SNR (> 10) at the lower luminosity limit, while guaranteeing we do not over expose at the upper limit.

Quiescent magnitudes of the nova system within the F275W, F336W, F475W, and F814W filters have been obtained from previous PHATS survey data and as such we have used these values in the ETC to obtain our required exposure times. The PHATS survey did not however, include the F225W NUV filter, and so we have estimated the lower flux limit in this filter by extrapolation of the accretion disk SED obtained from the archival photometry.

For each filter we will apply a two-point dither to enable the creation of subsampled HST images via astrodrizzle. We plan to operate the UVIS detector in a 2kx2k windowed mode, to reduce readout overheads.

Scheduling: We request scheduability of 100%. As we do not exactly know when this object will go off we require as large a visit window as possible. It is thought that the nova may erupt in as early as September 2015. We have adjusted our exposure times accordingly to take account of the shortest orbitial visibility needed to obtain 100% scheduability (approximately a five minute reduction per orbit from th numbers state in the Phase I case).

Visit

Proposal 14125, UV Spec T0 G140L (01), implementation Sun Aug 30 01:03:23 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/FUV-MAMA

Special Requirements: SCHED 100%; ORIENT 232D TO 28 D; ORIENT 47D TO 204 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(7)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=4	Angle Between Sides=		
	Point Spacing=0.168	Center Pattern=false		
	Line Spacing=			

Fixed Targets

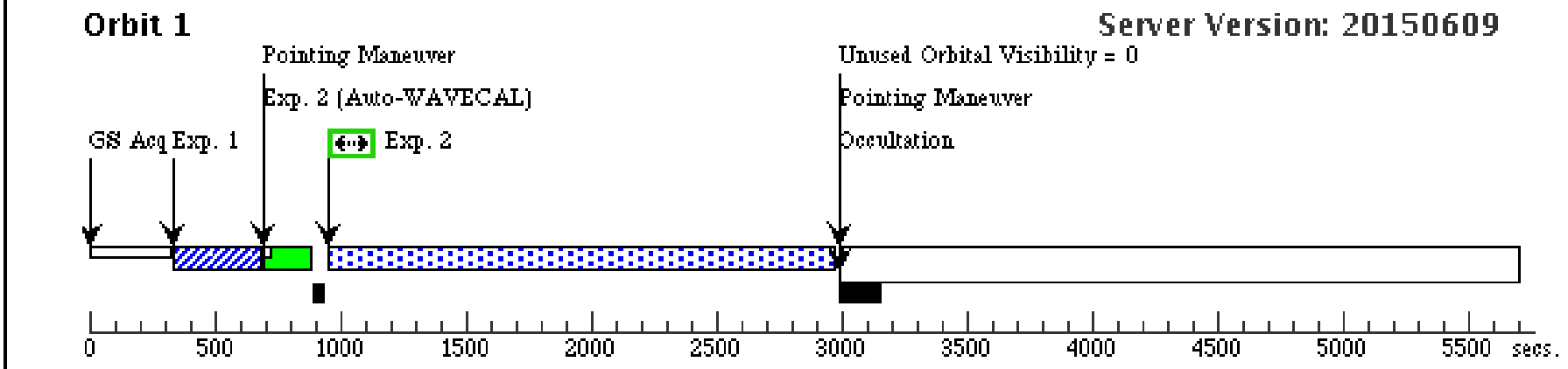
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	M31N-2008-12A	RA: 00 45 28.8200 (11.3700833d) Dec: +41 54 10.10 (41.90281d) Equinox: J2000		V=20.8+/-0.1 Maximum magnitudes obtained by this system within observing window (day 3 onwards): Sloan i'=20.8+/-0.1, Sloan r'=20.4+/-0.1, B=21.0+/-0.1, U=19.2+/-0.5	Reference Frame: ICRS
(2)	AQUSTAR	RA: 00 45 28.5265 (11.3688604d) Dec: +41 54 51.86 (41.91441d) Equinox: J2000	Epoch of Position: 1986.91	V=18.349+/-0.45	Reference Frame: ICRS

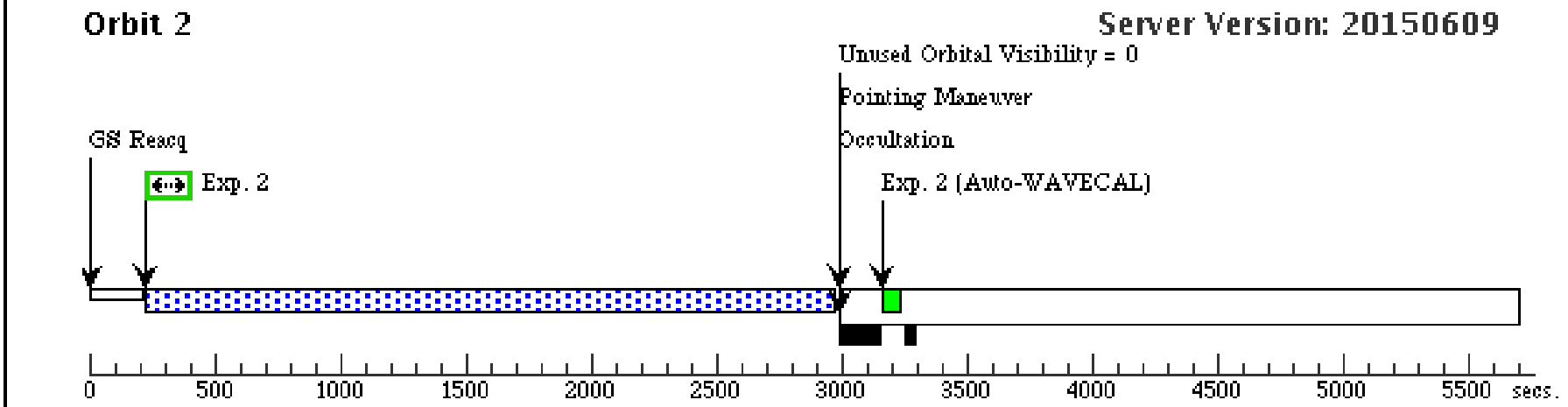
Comments: Extended=NO

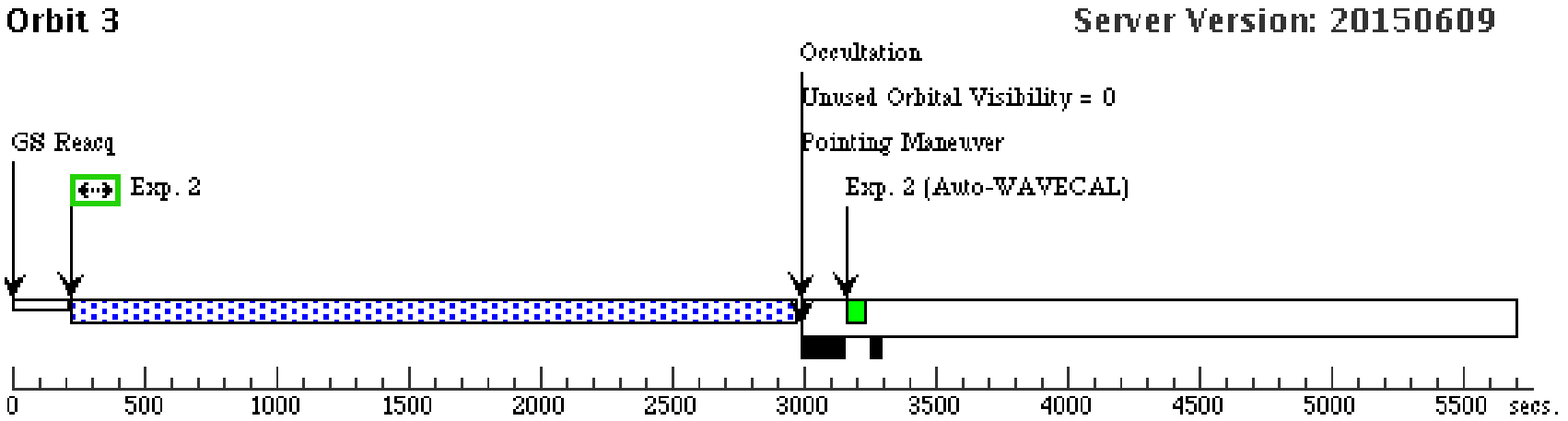
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	AQUIRE TARGET	(2) AQUSTAR	STIS/CCD, ACQ, F28X50LP	MIRROR		GS ACQ SCENARIO BASE1B3		30 Secs (30 Secs)	
								[==>]	***[1]***
2	Speactra G140L (STIS.sp.733005)	(1) M31N-2008-12A	STIS/FUV-MAMA, TIME-TAG, 52X0.2D1	G140L 1425 A	BUFFER-TIME=1371		Pattern 7, Exps 2-2 in UV Spec T0 G140L (01) (7)	2000 Secs (10234 Secs)	
								[==>2011.0 Secs (Pattern 1)]	***[1]***
								[==>2741.0 Secs (Pattern 2)]	***[2]***
								[==>2741.0 Secs (Pattern 3)]	***[3]***
								[==>2741.0 Secs (Pattern 4)]	***[4]***

Orbit Structure



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Exp. 2 (Auto-WAVECAL)
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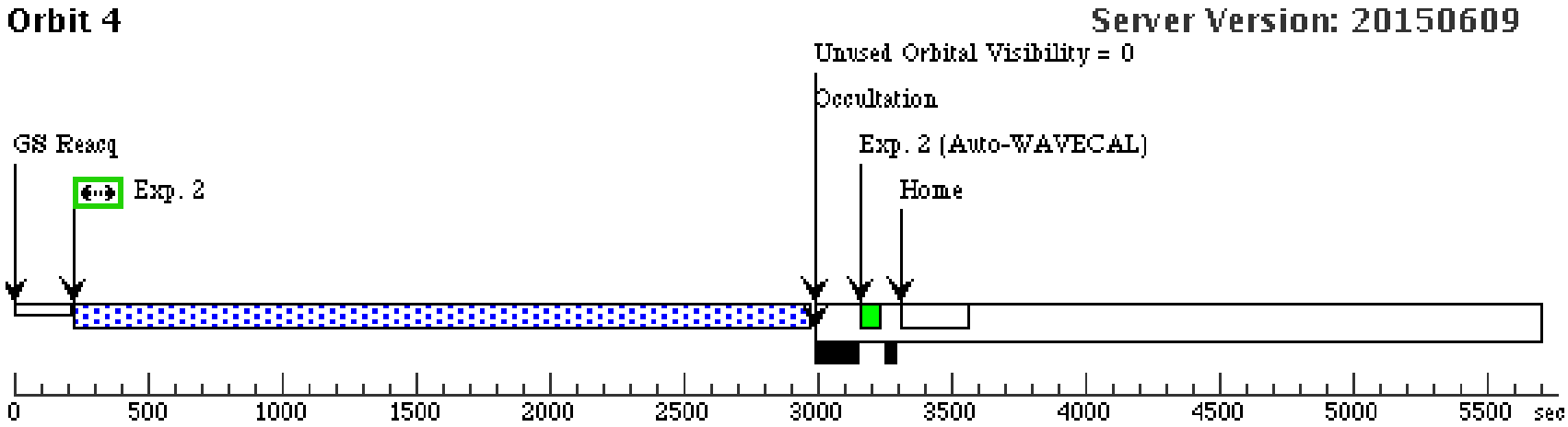
secs.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Server Version: 20150609
Unused Orbital Visibility = 0
Occultation
GS Reacq
Exp. 2
Exp. 2 (Auto-WAVECAL)
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500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14125, UV Spec T0 G230L (02a) (02), implementation Sun Aug 30 01:03:24 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/NUV-MAMA

Special Requirements: SCHED 100%; ORIENT 232D TO 28 D; ORIENT 47D TO 204 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(9)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.175	Center Pattern=false		
	Line Spacing=			

Fixed Targets

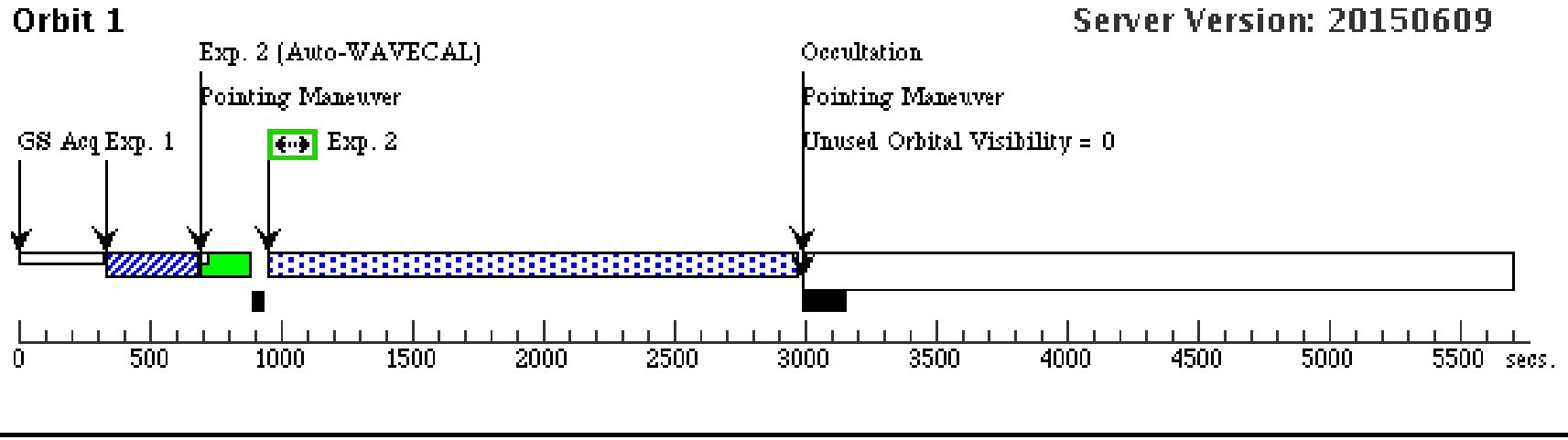
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	M31N-2008-12A	RA: 00 45 28.8200 (11.3700833d) Dec: +41 54 10.10 (41.90281d) Equinox: J2000		V=20.8+/-0.1 Maximum magnitudes obtained by this system within observing window (day 3 onwards): Sloan i'=20.8+/-0.1, Sloan r'=20.4+/-0.1, B=21.0+/-0.1, U=19.2+/-0.5	Reference Frame: ICRS
(2)	AQUSTAR	RA: 00 45 28.5265 (11.3688604d) Dec: +41 54 51.86 (41.91441d) Equinox: J2000	Epoch of Position: 1986.91	V=18.349+/-0.45	Reference Frame: ICRS

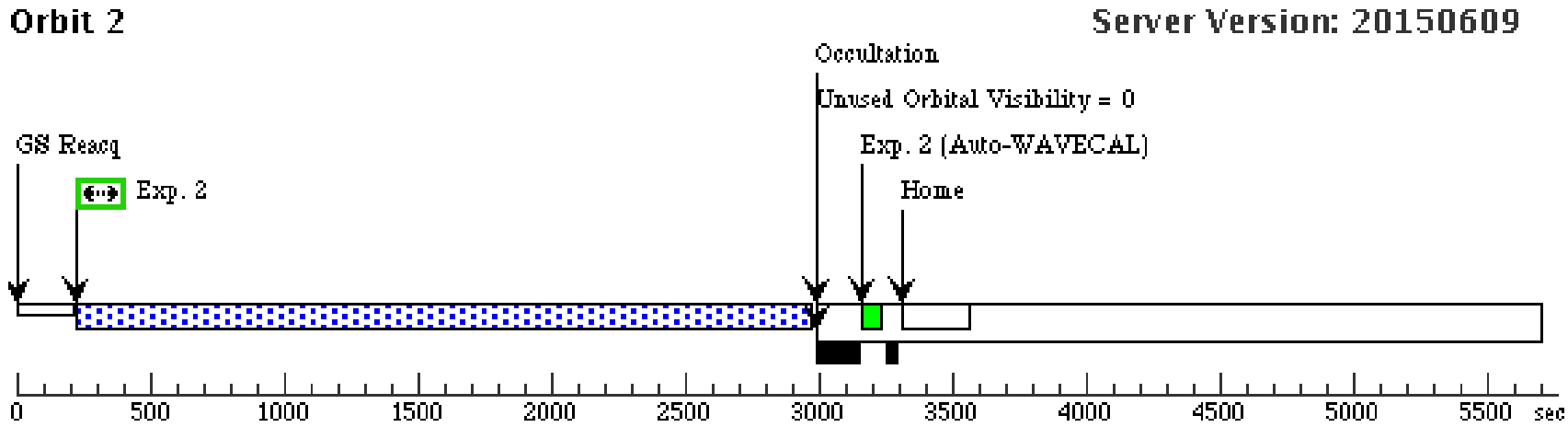
Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	AQUIRE TARGET	(2) AQUSTAR	STIS/CCD, ACQ, F28X50LP	MIRROR		GS ACQ SCENARIO BASE1B3		30 Secs (30 Secs)	
								[==>]	***[1]***
2	Speactra G230L (STIS.sp.733191)	(1) M31N-2008-12A	STIS/NUV-MAMA, TIME-TAG, 52X0.2	G230L 2376 A	BUFFER-TIME=1371		Pattern 9, Exps 2-2 in UV Spec T0 G230L (02a) (02) (9)	2000 Secs (4752 Secs)	
								[==>2011.0 Secs (Pattern 1)]	***[1]***
								[==>2741.0 Secs (Pattern 2)]	***[2]***

Orbit Structure





Visit

Proposal 14125, UV Spec T0 G230L (02b) (03) Sun Aug 30 01:03:24 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD, STIS/NUV-MAMA

Special Requirements: SCHED 100%; ORIENT 232D TO 28 D; ORIENT 47D TO 204 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(9)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG		(2)
	Purpose=DITHER	Pattern Orientation=90.0		
	Number Of Points=2	Angle Between Sides=		
	Point Spacing=0.175	Center Pattern=false		
	Line Spacing=			

Fixed Targets

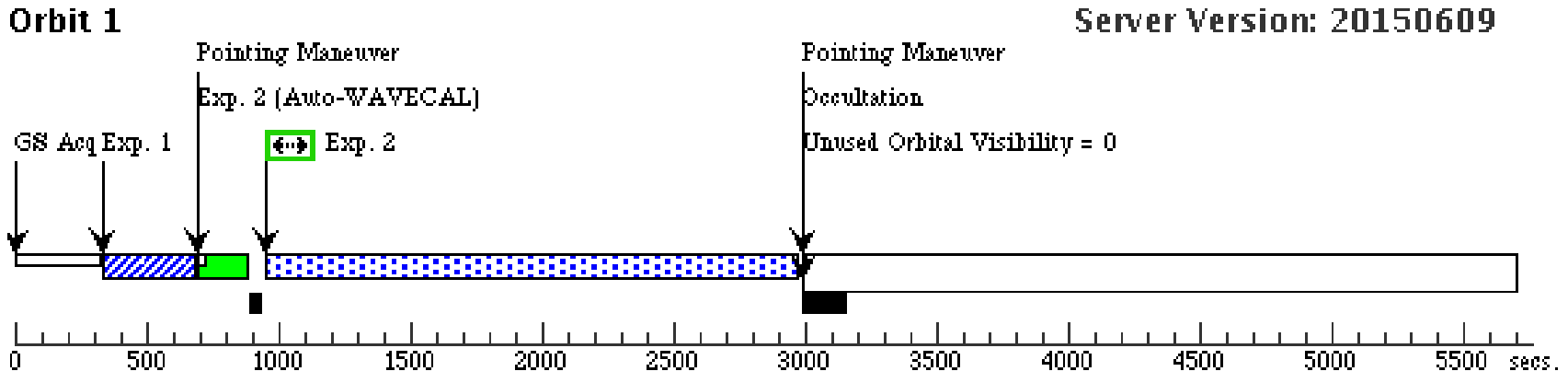
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	M31N-2008-12A	RA: 00 45 28.8200 (11.3700833d) Dec: +41 54 10.10 (41.90281d) Equinox: J2000		V=20.8+/-0.1 Maximum magnitudes obtained by this system within observing window (day 3 onwards): Sloan i'=20.8+/-0.1, Sloan r'=20.4+/-0.1, B=21.0+/-0.1, U=19.2+/-0.5	Reference Frame: ICRS
(2)	AQUSTAR	RA: 00 45 28.5265 (11.3688604d) Dec: +41 54 51.86 (41.91441d) Equinox: J2000	Epoch of Position: 1986.91	V=18.349+/-0.45	Reference Frame: ICRS

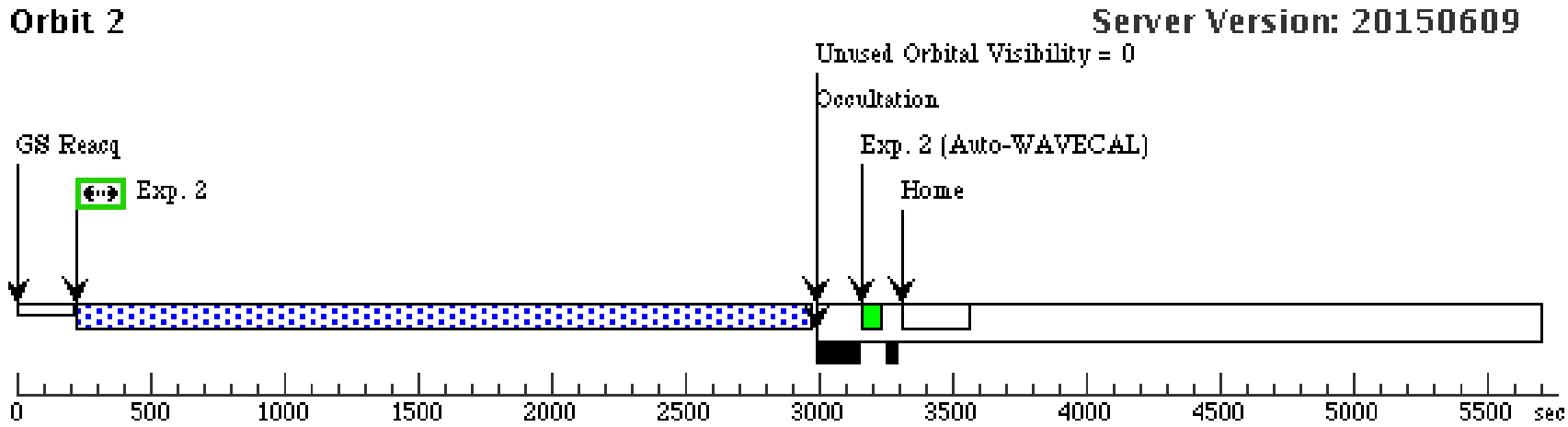
Comments: Extended=NO

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	AQUIRE TARGET	(2) AQUSTAR	STIS/CCD, ACQ, F28X50LP	MIRROR		GS ACQ SCENARIO BASE1B3		30 Secs (30 Secs)	
								[==>]	***[1]***
2	Speactra G230L (STIS.sp.733191)	(1) M31N-2008-12A	STIS/NUV-MAMA, TIME-TAG, 52X0.2	G230L 2376 A	BUFFER-TIME=1371		Pattern 9, Exps 2-2 in UV Spec T0 G230L (02b) (03) (9)	2000 Secs (4752 Secs)	
								[==>2011.0 Secs (Pattern 1)]	***[1]***
								[==>2741.0 Secs (Pattern 2)]	***[2]***

Orbit Structure





Visit

Proposal 14125, PHOT T10 (04) Sun Aug 30 01:03:24 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; AFTER 01 BY 10 D TO 12 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(6)	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2), (3), (4), (5)

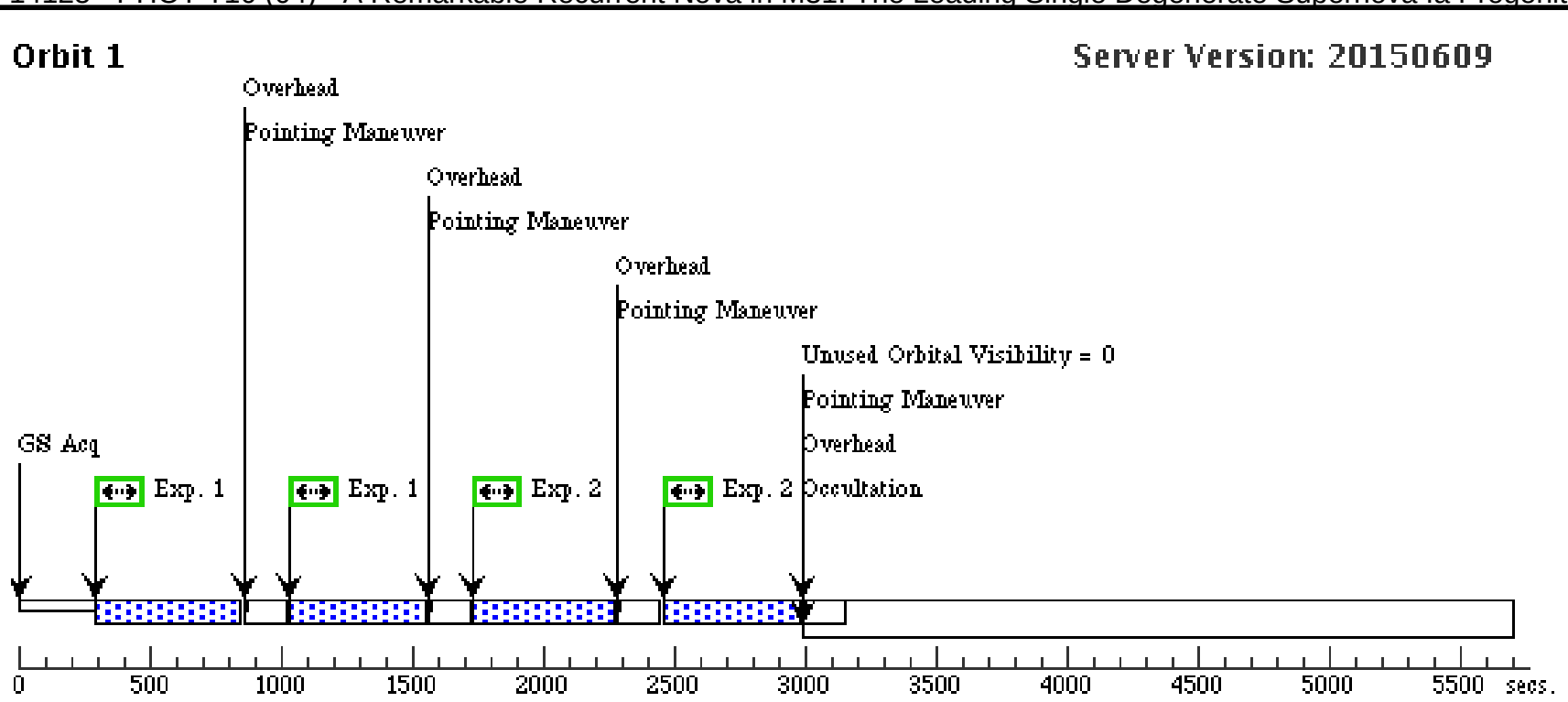
Fixed Targets

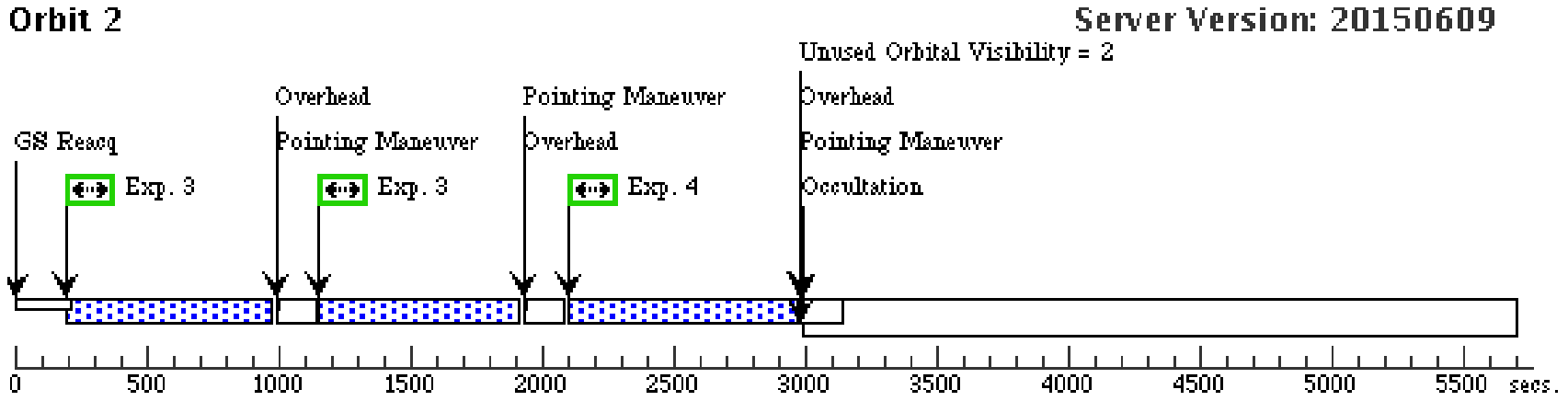
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	M31N-2008-12A	RA: 00 45 28.8200 (11.3700833d) Dec: +41 54 10.10 (41.90281d) Equinox: J2000		V=20.8+/-0.1 Maximum magnitudes obtained by this system within observing window (day 3 onwards): Sloan i'=20.8+/-0.1, Sloan r'=20.4+/-0.1, B=21.0+/-0.1, U=19.2+/-0.5	Reference Frame: ICRS

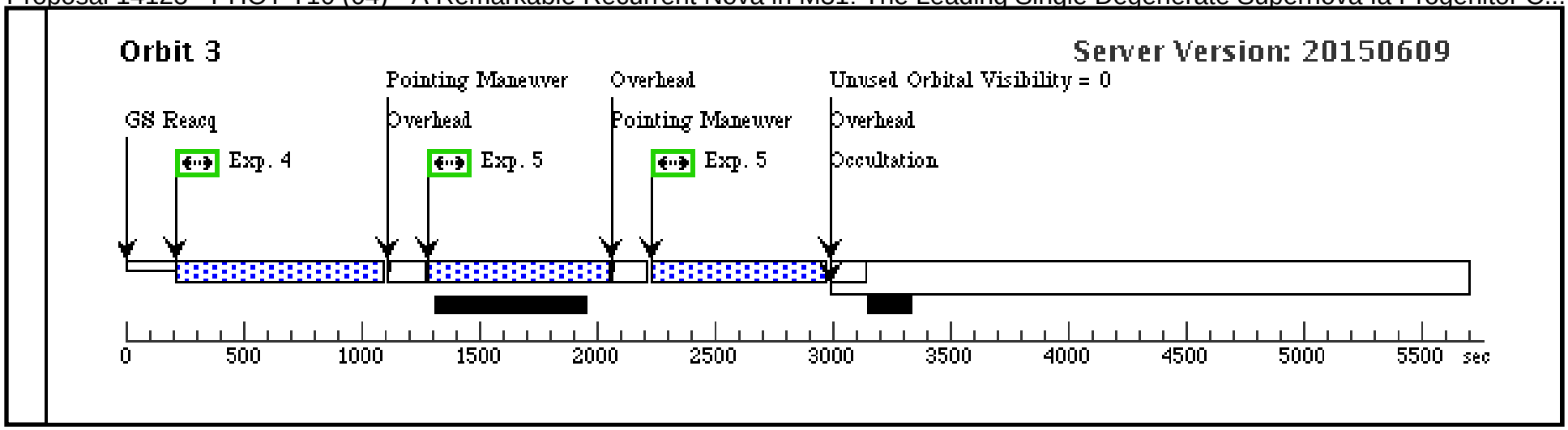
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F275W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F275W	FLASH=12	GS ACQ SCENARIO BASE1B3	Pattern 6, Exps 1-1 in PHOT T10 (04) (6)	500 Secs (1038 Secs) *[==>519.0 Secs (Pattern 1)]* *[==>519.0 Secs (Pattern 2)]*	***[1]***
2	F336W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F336W	FLASH=10		Pattern 6, Exps 2-2 in PHOT T10 (04) (6)	500 Secs (1038 Secs) *[==>519.0 Secs (Pattern 1)]* *[==>519.0 Secs (Pattern 2)]*	***[1]***
3	F814W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W			Pattern 6, Exps 3-3 in PHOT T10 (04) (6)	750 Secs (1528 Secs) *[==>764.0 Secs (Pattern 1)]* *[==>764.0 Secs (Pattern 2)]*	***[2]***
4	F225W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F225W	FLASH=9		Pattern 6, Exps 4-4 in PHOT T10 (04) (6)	840 Secs (1739 Secs) *[==>854.0 Secs (Pattern 1)]* *[==>885.0 Secs (Pattern 2)]*	 ***[2]*** ***[3]***
5	F475W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F475W			Pattern 6, Exps 5-5 in PHOT T10 (04) (6)	700 Secs (1490 Secs) *[==>745.0 Secs (Pattern 1)]* *[==>745.0 Secs (Pattern 2)]*	 ***[3]***

Orbit Structure






Orbit 3
Server Version: 20150609
GS Reacq
Exp. 4
Pointing Maneuver
Overhead
Exp. 5
Overhead
Pointing Maneuver
Exp. 5
Unused Orbital Visibility = 0
Overhead
Occultation
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1000
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2000
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3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 14125, PHOT T17 (05) Sun Aug 30 01:03:24 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; AFTER 01 BY 17 D TO 18 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(6)	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2), (3), (4), (5)

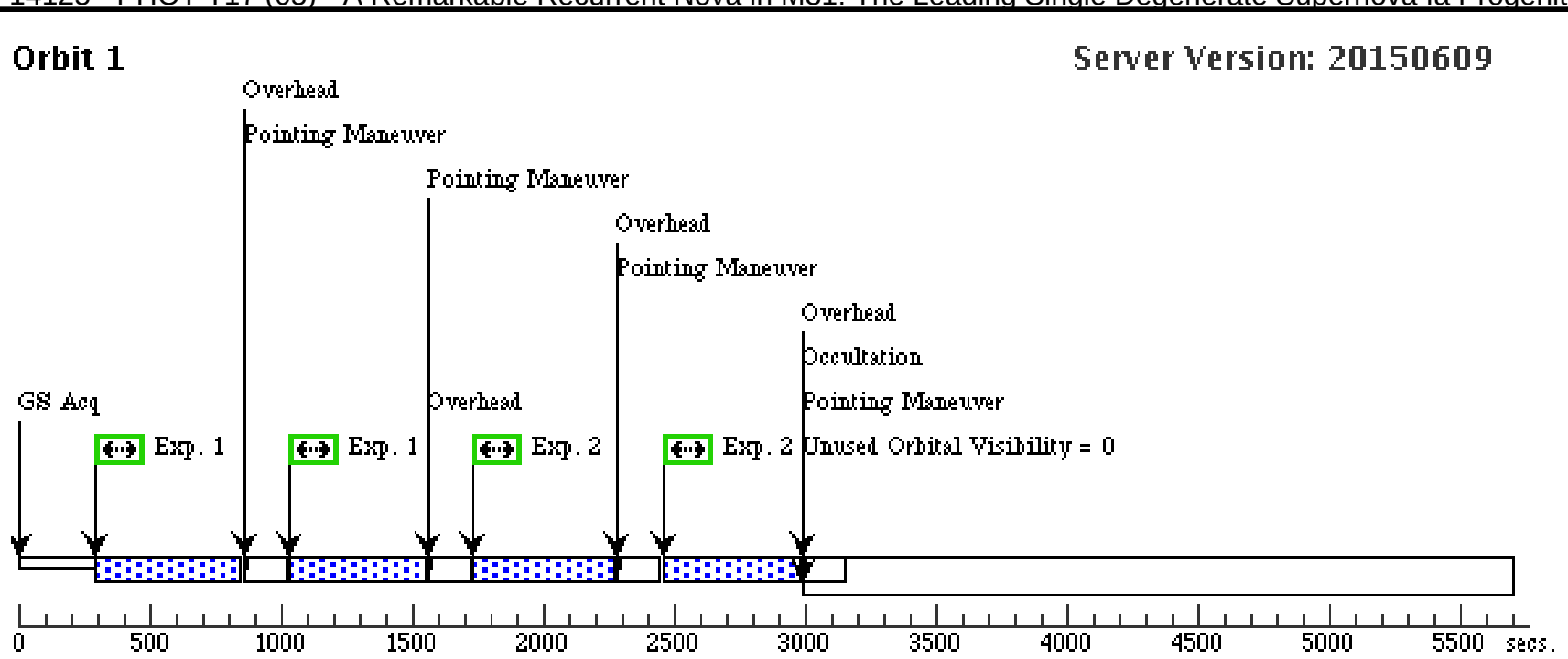
Fixed Targets

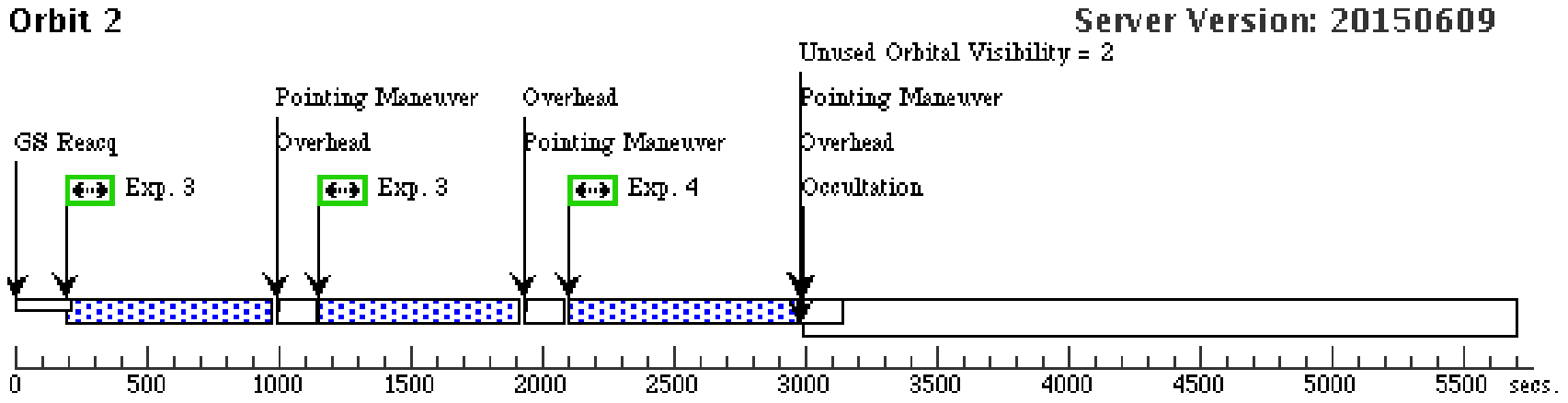
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	M31N-2008-12A	RA: 00 45 28.8200 (11.3700833d) Dec: +41 54 10.10 (41.90281d) Equinox: J2000		V=20.8+/-0.1 Maximum magnitudes obtained by this system within observing window (day 3 onwards): Sloan i'=20.8+/-0.1, Sloan r'=20.4+/-0.1, B=21.0+/-0.1, U=19.2+/-0.5	Reference Frame: ICRS

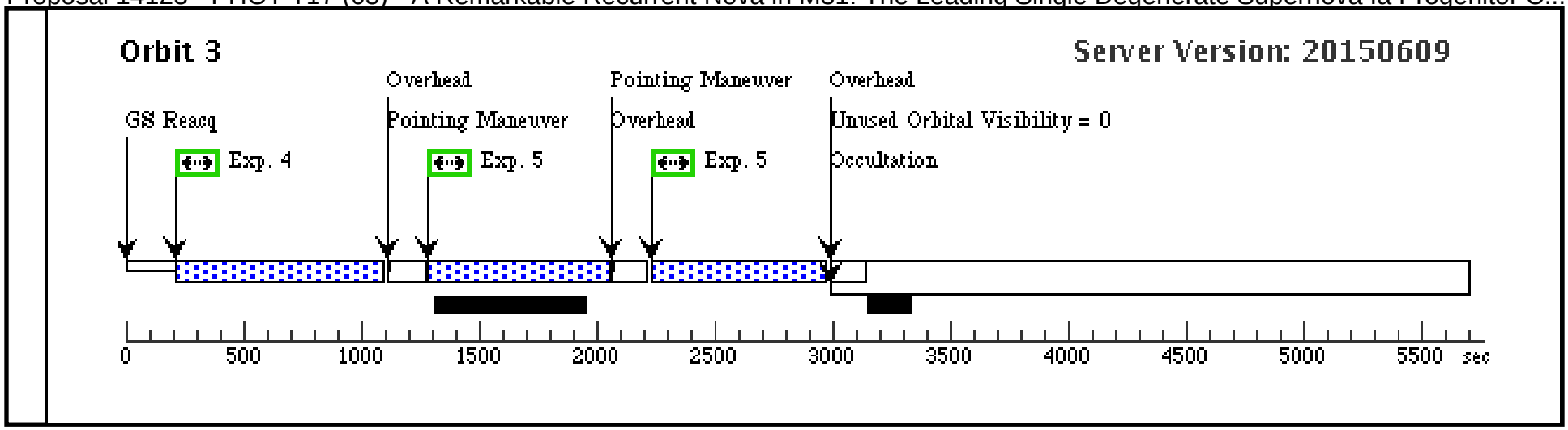
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F275W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F275W	FLASH=12	GS ACQ SCENARIO BASE1B3	Pattern 6, Exps 1-1 in PHOT T17 (05) (6)	500 Secs (1038 Secs) *[==>519.0 Secs (Pattern 1)]* *[==>519.0 Secs (Pattern 2)]*	***[1]***
2	F336W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F336W	FLASH=10		Pattern 6, Exps 2-2 in PHOT T17 (05) (6)	500 Secs (1038 Secs) *[==>519.0 Secs (Pattern 1)]* *[==>519.0 Secs (Pattern 2)]*	***[1]***
3	F814W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W			Pattern 6, Exps 3-3 in PHOT T17 (05) (6)	750 Secs (1528 Secs) *[==>764.0 Secs (Pattern 1)]* *[==>764.0 Secs (Pattern 2)]*	***[2]***
4	F225W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F225W	FLASH=9		Pattern 6, Exps 4-4 in PHOT T17 (05) (6)	840 Secs (1739 Secs) *[==>854.0 Secs (Pattern 1)]* *[==>885.0 Secs (Pattern 2)]*	 ***[2]*** ***[3]***
5	F475W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F475W			Pattern 6, Exps 5-5 in PHOT T17 (05) (6)	700 Secs (1490 Secs) *[==>745.0 Secs (Pattern 1)]* *[==>745.0 Secs (Pattern 2)]*	***[3]***

Orbit Structure






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

Visit

Proposal 14125, PHOT T24 (06) Sun Aug 30 01:03:25 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; AFTER 01 BY 23 D TO 24 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(6)	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2), (3), (4), (5)

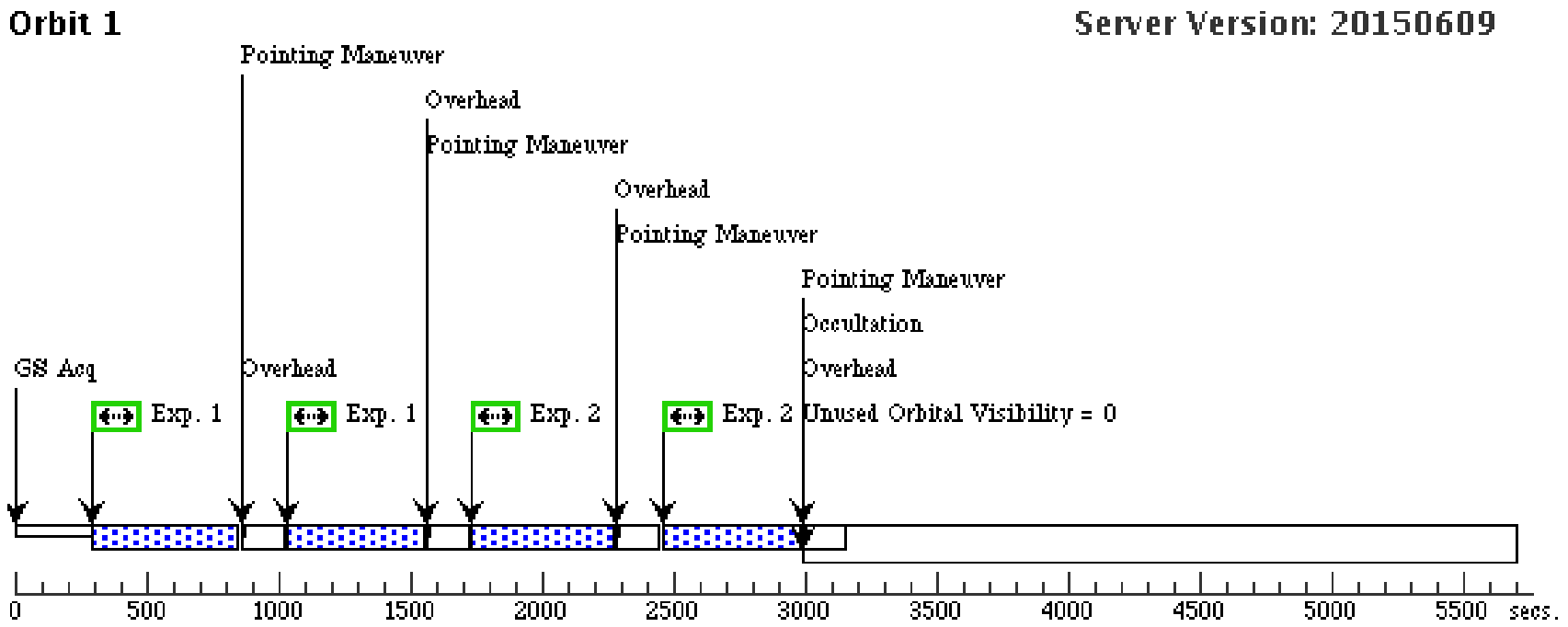
Fixed Targets

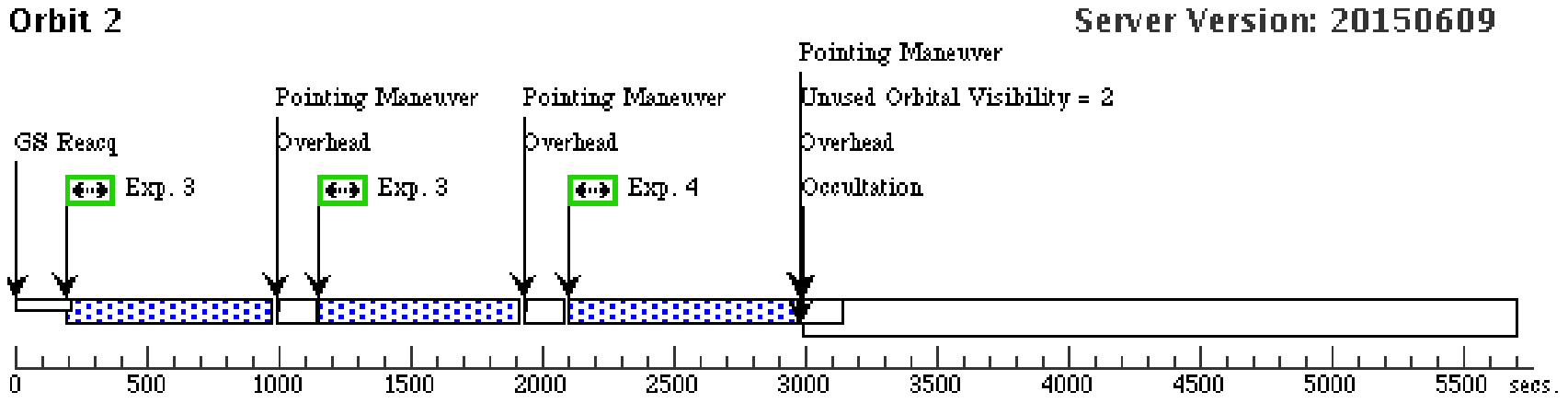
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	M31N-2008-12A	RA: 00 45 28.8200 (11.3700833d) Dec: +41 54 10.10 (41.90281d) Equinox: J2000		V=20.8+/-0.1 Maximum magnitudes obtained by this system within observing window (day 3 onwards): Sloan i'=20.8+/-0.1, Sloan r'=20.4+/-0.1, B=21.0+/-0.1, U=19.2+/-0.5	Reference Frame: ICRS

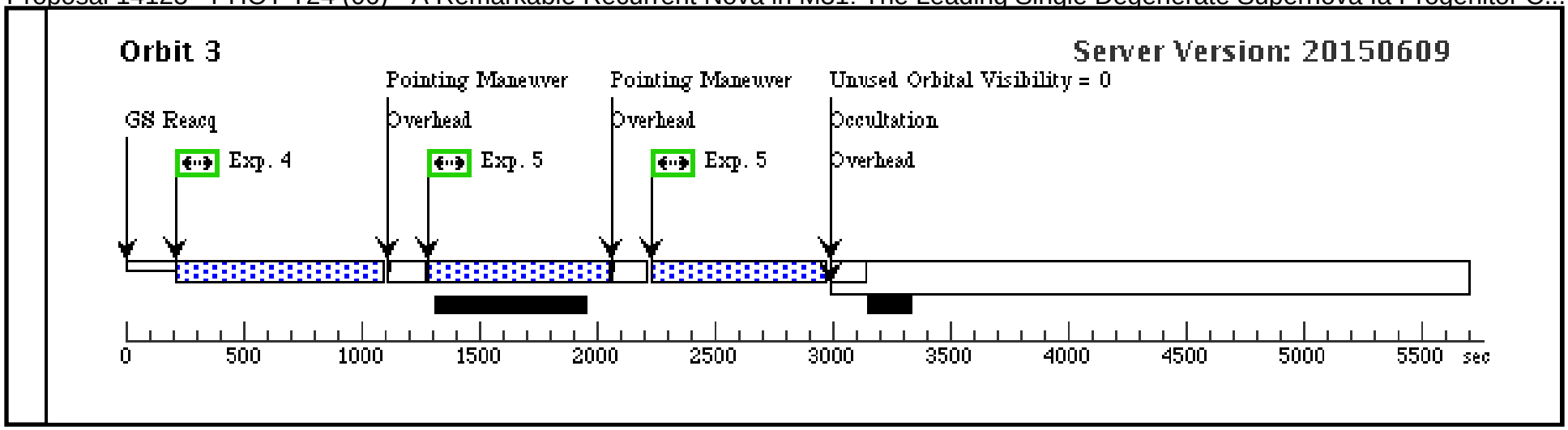
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F275W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F275W	FLASH=12	GS ACQ SCENARIO BASE1B3	Pattern 6, Exps 1-1 in PHOT T24 (06) (6)	500 Secs (1038 Secs) *[==>519.0 Secs (Pattern 1)]* *[==>519.0 Secs (Pattern 2)]*	***[1]***
2	F336W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F336W	FLASH=10		Pattern 6, Exps 2-2 in PHOT T24 (06) (6)	500 Secs (1038 Secs) *[==>519.0 Secs (Pattern 1)]* *[==>519.0 Secs (Pattern 2)]*	***[1]***
3	F814W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W			Pattern 6, Exps 3-3 in PHOT T24 (06) (6)	750 Secs (1528 Secs) *[==>764.0 Secs (Pattern 1)]* *[==>764.0 Secs (Pattern 2)]*	***[2]***
4	F225W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F225W	FLASH=9		Pattern 6, Exps 4-4 in PHOT T24 (06) (6)	840 Secs (1739 Secs) *[==>854.0 Secs (Pattern 1)]* *[==>885.0 Secs (Pattern 2)]*	 ***[2]*** ***[3]***
5	F475W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F475W			Pattern 6, Exps 5-5 in PHOT T24 (06) (6)	700 Secs (1490 Secs) *[==>745.0 Secs (Pattern 1)]* *[==>745.0 Secs (Pattern 2)]*	 ***[3]***

Orbit Structure






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

Visit

Proposal 14125, PHOT T31 (07) Sun Aug 30 01:03:25 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: SCHED 100%; AFTER 01 BY 30 D TO 31 D

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(6)	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1), (2), (3), (4), (5)

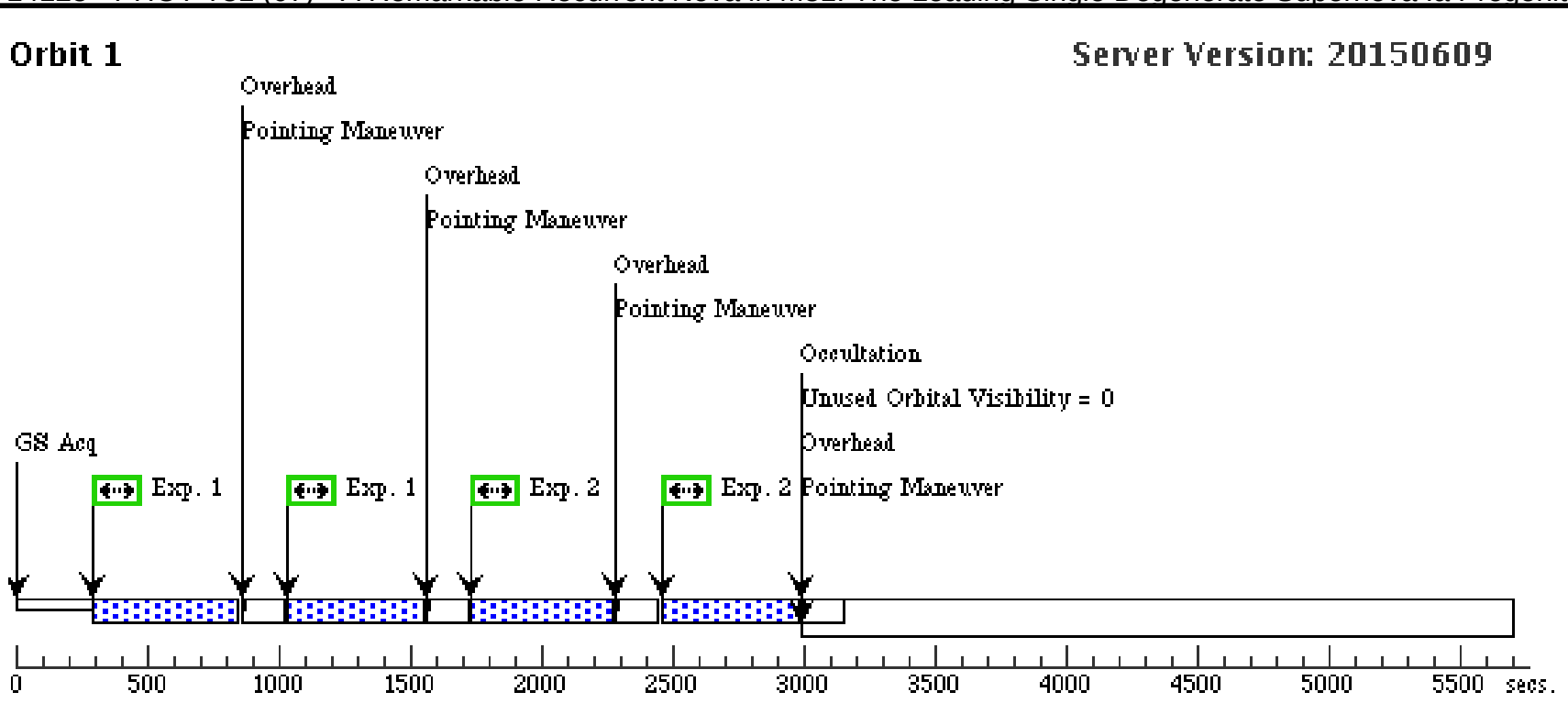
Fixed Targets

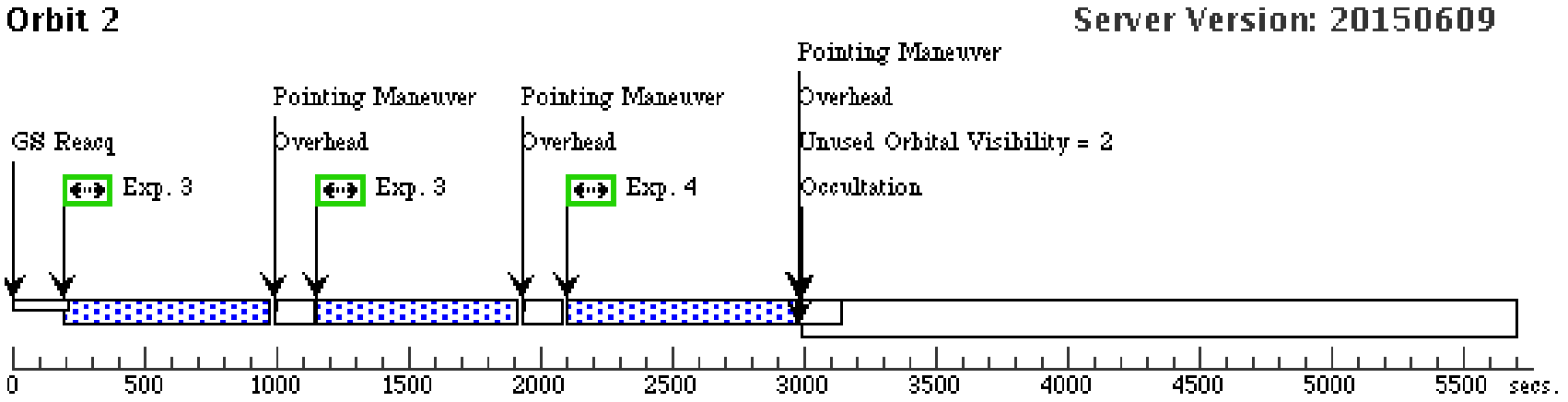
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	M31N-2008-12A	RA: 00 45 28.8200 (11.3700833d) Dec: +41 54 10.10 (41.90281d) Equinox: J2000		V=20.8+/-0.1 Maximum magnitudes obtained by this system within observing window (day 3 onwards): Sloan i'=20.8+/-0.1, Sloan r'=20.4+/-0.1, B=21.0+/-0.1, U=19.2+/-0.5	Reference Frame: ICRS

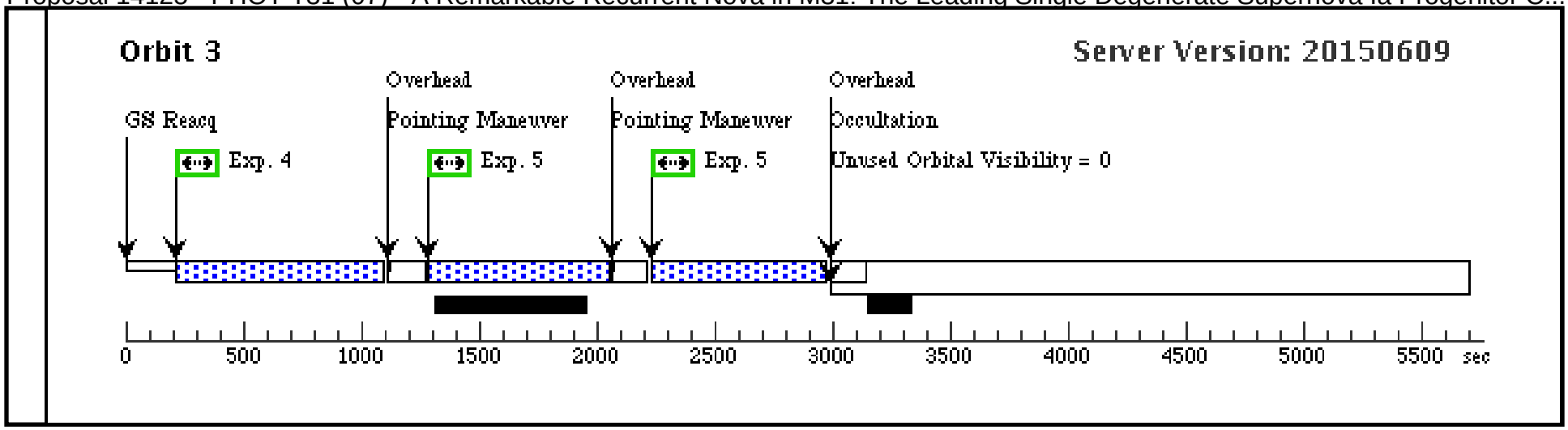
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F275W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F275W	FLASH=12	GS ACQ SCENARIO BASE1B3	Pattern 6, Exps 1-1 in PHOT T31 (07) (6)	500 Secs (1038 Secs) *[==>519.0 Secs (Pattern 1)]* *[==>519.0 Secs (Pattern 2)]*	***[1]***
2	F336W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F336W	FLASH=10		Pattern 6, Exps 2-2 in PHOT T31 (07) (6)	500 Secs (1038 Secs) *[==>519.0 Secs (Pattern 1)]* *[==>519.0 Secs (Pattern 2)]*	***[1]***
3	F814W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W			Pattern 6, Exps 3-3 in PHOT T31 (07) (6)	750 Secs (1528 Secs) *[==>764.0 Secs (Pattern 1)]* *[==>764.0 Secs (Pattern 2)]*	***[2]***
4	F225W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F225W	FLASH=9		Pattern 6, Exps 4-4 in PHOT T31 (07) (6)	840 Secs (1739 Secs) *[==>854.0 Secs (Pattern 1)]* *[==>885.0 Secs (Pattern 2)]*	 ***[2]*** ***[3]***
5	F475W	(1) M31N-2008-12A	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F475W			Pattern 6, Exps 5-5 in PHOT T31 (07) (6)	700 Secs (1490 Secs) *[==>745.0 Secs (Pattern 1)]* *[==>745.0 Secs (Pattern 2)]*	 ***[3]***

Orbit Structure






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