16784 - Red or Reddened Supernovae? Understanding the Ultraviolet Differences of Normal Standard Candles

Cycle: 29, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
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VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
05	(2) REDSNIA-2	STIS/CCD STIS/NUV-MAMA	3	30-Jul-2021 14:08:28.0	yes
06	(2) REDSNIA-2	STIS/CCD STIS/NUV-MAMA	3	30-Jul-2021 14:08:30.0	yes
07	(2) REDSNIA-2	STIS/CCD STIS/NUV-MAMA	3	30-Jul-2021 14:08:31.0	yes
08	(2) REDSNIA-2	STIS/CCD STIS/NUV-MAMA	5	30-Jul-2021 14:08:33.0	yes

14 Total Orbits Used

ABSTRACT

Constraining systematic uncertainties is critical to accurately and confidently use type Ia supernovae as precise cosmological distance indicators. The two dominant astrophysical systematics in optical-based studies are dust reddening and intrinsic color differences. Swift ultraviolet observations of even the most normal type Ia supernovae show a large dispersion in colors, consistent with contributions from both intrinsic differences and dust reddening. The four sets of high-quality ultraviolet spectra with the Hubble Space Telescope do not yet fully sample this distribution, but comparisons among them reveal a complexity which requires the contribution of multiple effects. We request a series of ultraviolet spectroscopy of one more type Ia supernovae. These will be chosen based on early Swift photometry to be of the undersampled red variety, allowing us to measure the wavelength dependence of the intrinsic color and/or host galaxy reddening by comparison with the existing samples. We will determine the source of the differences and constrain the effect they have on the optical measurements used in cosmological measurements. The spectra will also be a significant fraction of the local comparison sample against which we can compare the rest-frame ultraviolet spectra of higher redshift type Ia supernovae.

OBSERVING DESCRIPTION

This program will trigger on two type Ia supernovae which appear to be intrinsically red or reddened by dust based on early observations including UV data from Swift UVOT. HST will obtain multi-epoch STIS ultraviolet spectroscopy at four epochs separated by about 5 days.

Visit

Proposal 16784, red visit 1 (05), implementation Fri Jul 30 18:08:34 GMT 2021

Diagnostic Status: No Diagnostics

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

Special Requirements: ON HOLD ; TOO RESPONSE TIME 3.0D

On Hold Comments: ToO trigger

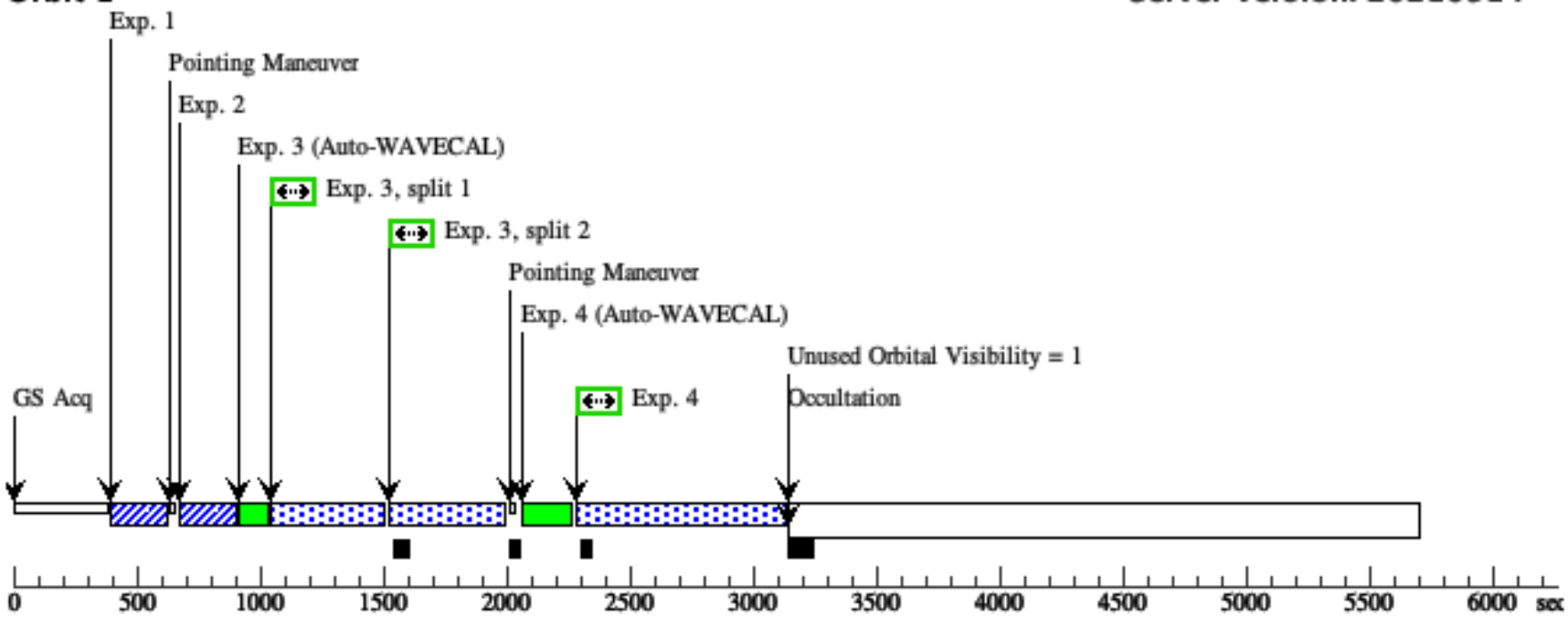
Generic Targets

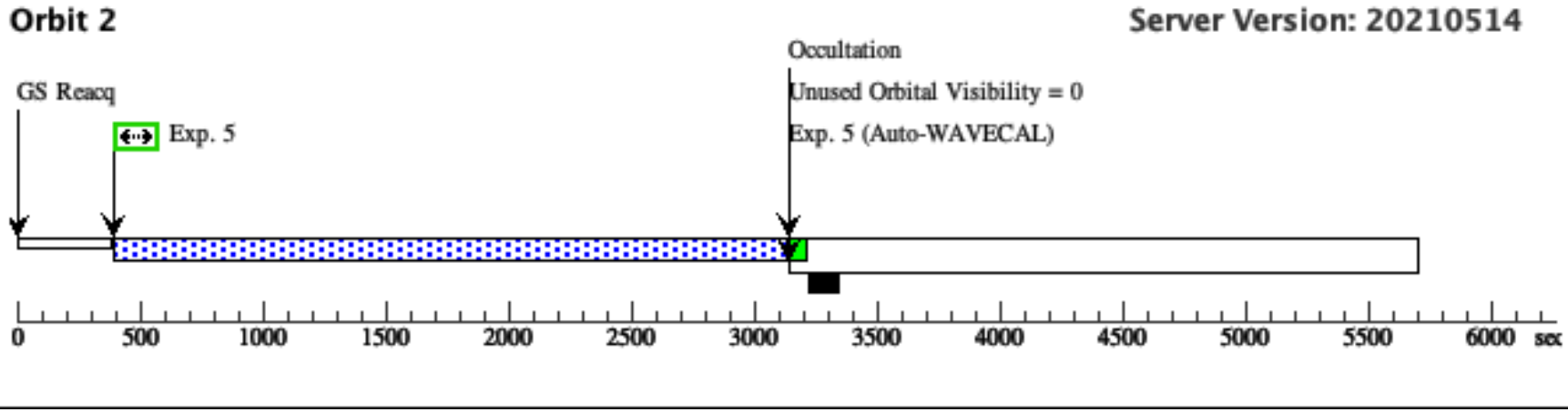
#	Name	Criteria	Description
(2)	REDSNIA-2	red supernova Ia	SUPERNOVA TYPE IA

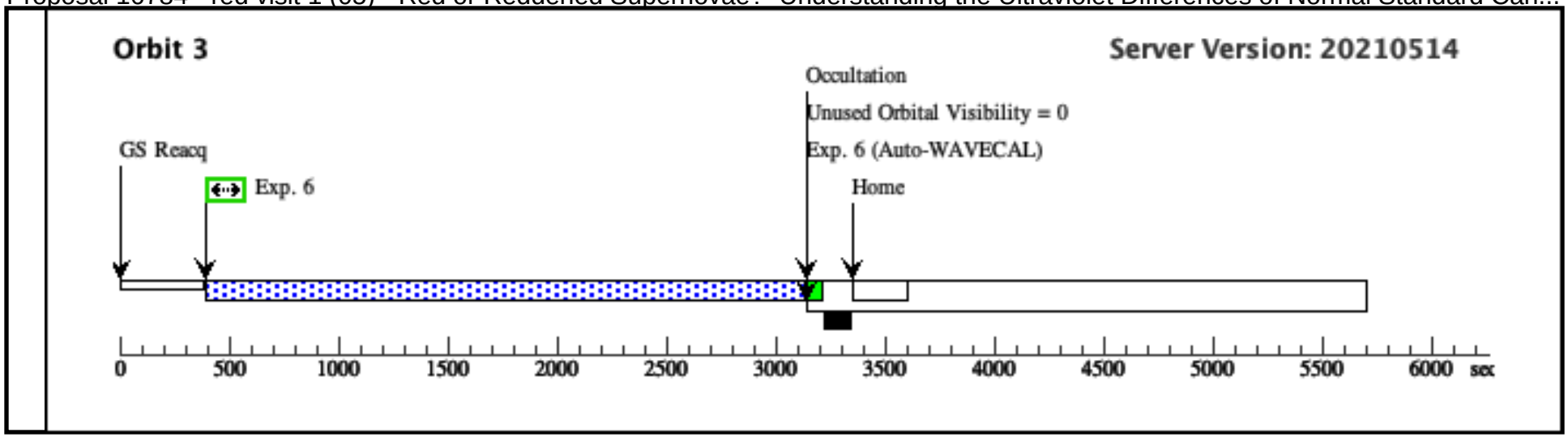
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	acq (1003284)	(2) REDSNIA-2	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	acq/peak (1003285)	(2) REDSNIA-2	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
3	nuvopt-stis (1003290)	(2) REDSNIA-2	STIS/CCD, ACCUM, 52X0.1E1	G430L 4300 A				800 Secs (864 Secs) *[==>432.0 Secs (Split 1)]* *[==>432.0 Secs (Split 2)]*	 ***[1]***
4	nuv-mama (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				800 Secs (832 Secs) *[==>832.0 Secs]*	 ***[1]***
5	nuv-mama2 (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				3000 Secs (2722 Secs) *[==>2722.0 Secs]*	 ***[2]***
6	nuv-mama3 (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				3000 Secs (2722 Secs) *[==>2722.0 Secs]*	 ***[3]***

Orbit Structure



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Visit

Proposal 16784, red visit 2 (06), implementation Fri Jul 30 18:08:34 GMT 2021

Diagnostic Status: No Diagnostics

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

Special Requirements: AFTER 05 BY 4 D TO 6 D; ON HOLD

On Hold Comments: ToO trigger

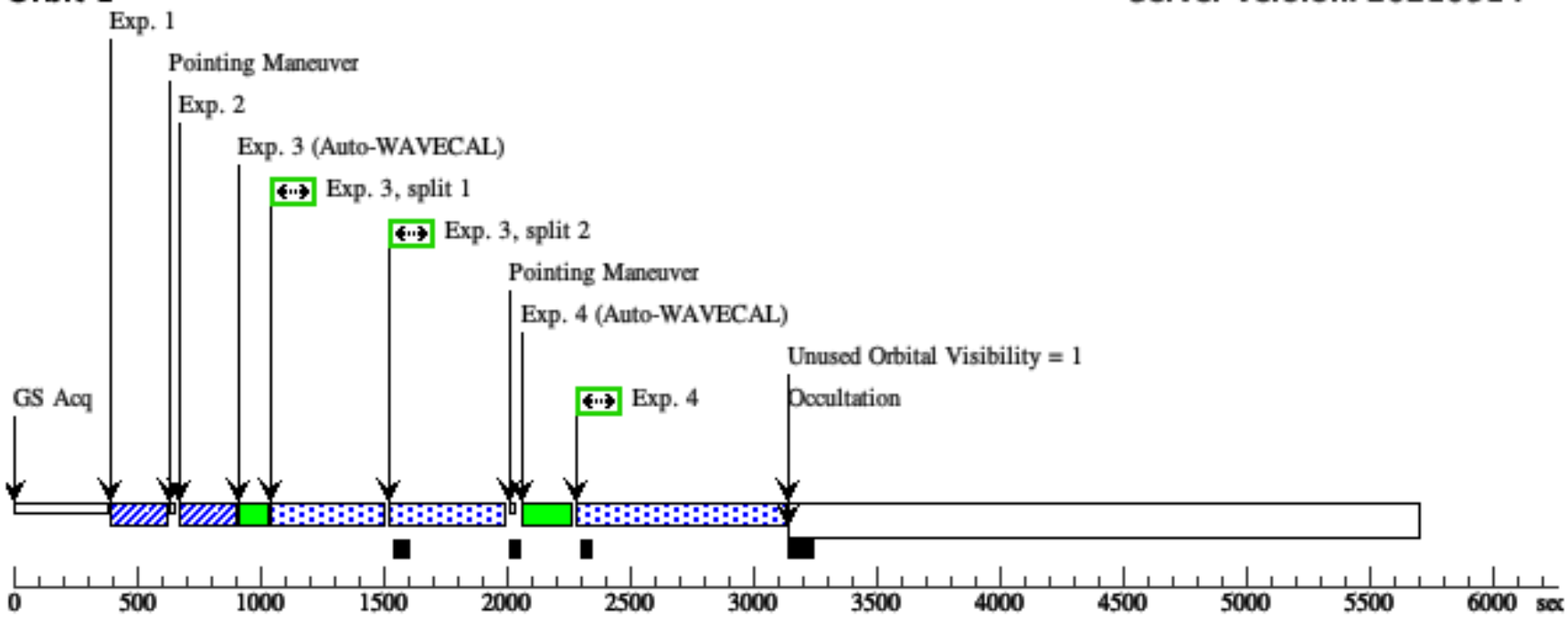
Generic Targets

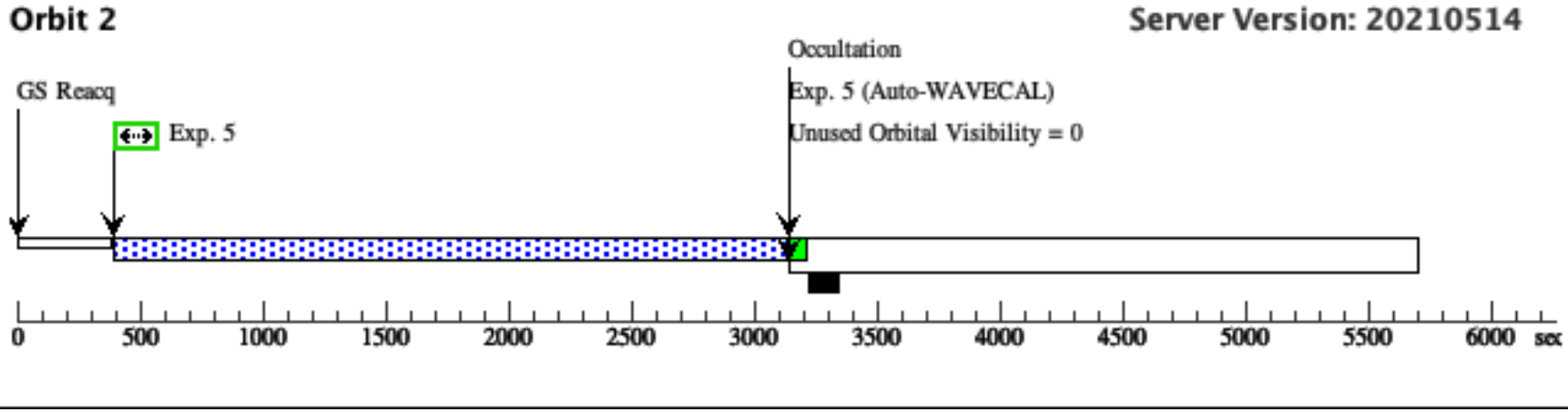
#	Name	Criteria	Description
(2)	REDSNIA-2	red supernova Ia	SUPERNOVA TYPE IA

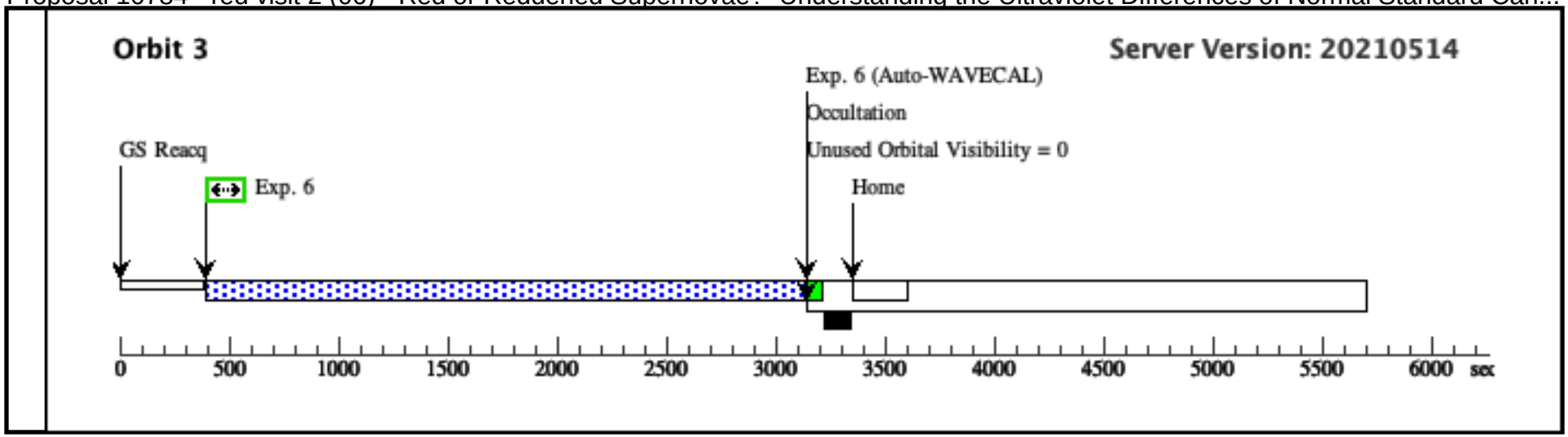
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	acq (1003284)	(2) REDSNIA-2	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	acq/peak (1003285)	(2) REDSNIA-2	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
3	nuvopt-stis (1003290)	(2) REDSNIA-2	STIS/CCD, ACCUM, 52X0.1E1	G430L 4300 A				800 Secs (864 Secs) *[==>432.0 Secs (Split 1)]* *[==>432.0 Secs (Split 2)]*	 ***[1]***
4	nuv-mama (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				800 Secs (832 Secs) *[==>832.0 Secs]*	 ***[1]***
5	nuv-mama2 (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				3000 Secs (2722 Secs) *[==>2722.0 Secs]*	 ***[2]***
6	nuv-mama3 (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				3000 Secs (2722 Secs) *[==>2722.0 Secs]*	 ***[3]***

Orbit Structure



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Visit

Proposal 16784, red visit 3 (07), implementation Fri Jul 30 18:08:35 GMT 2021

Diagnostic Status: No Diagnostics

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

Special Requirements: AFTER 06 BY 4 D TO 6 D; ON HOLD

On Hold Comments: ToO trigger

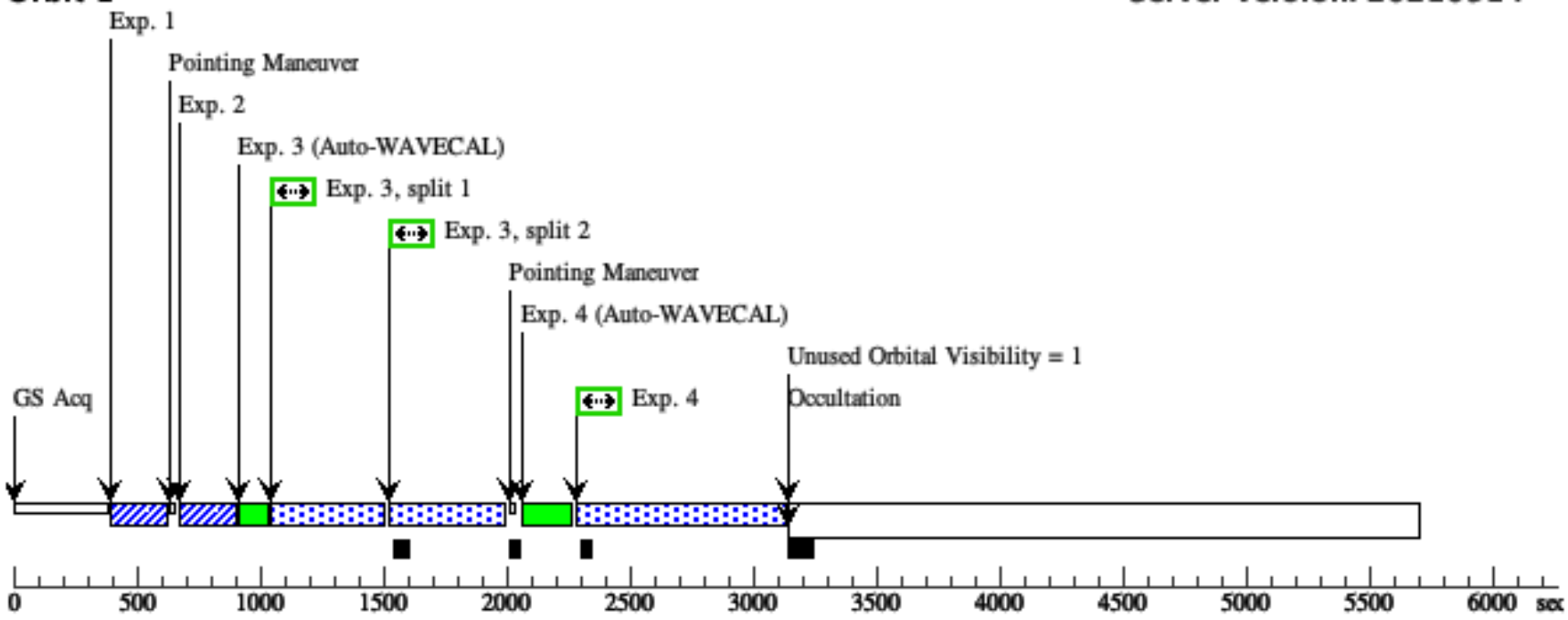
Generic Targets

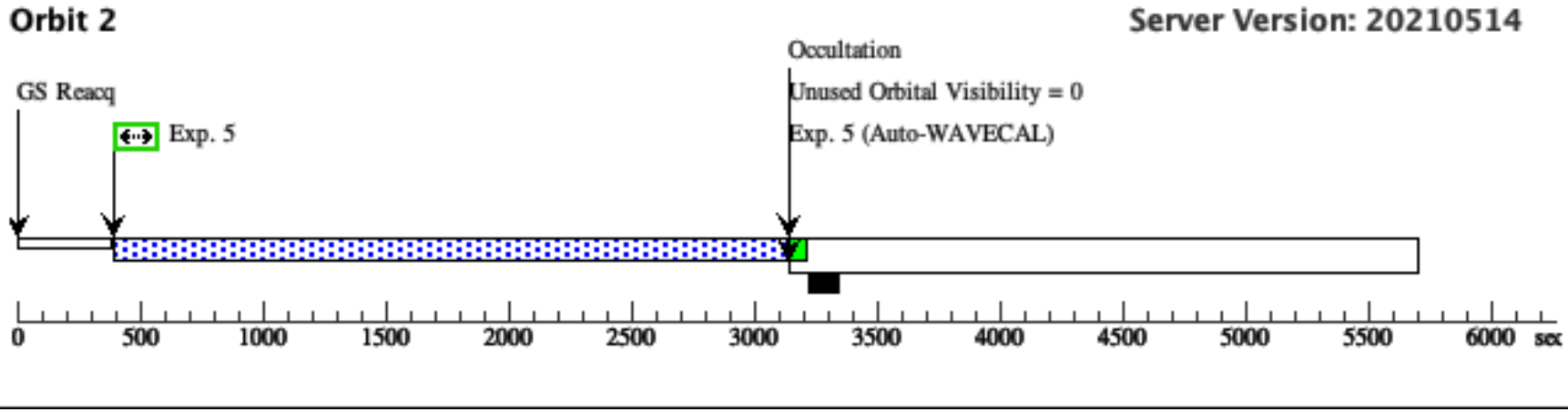
#	Name	Criteria	Description
(2)	REDSNIA-2	red supernova Ia	SUPERNOVA TYPE IA

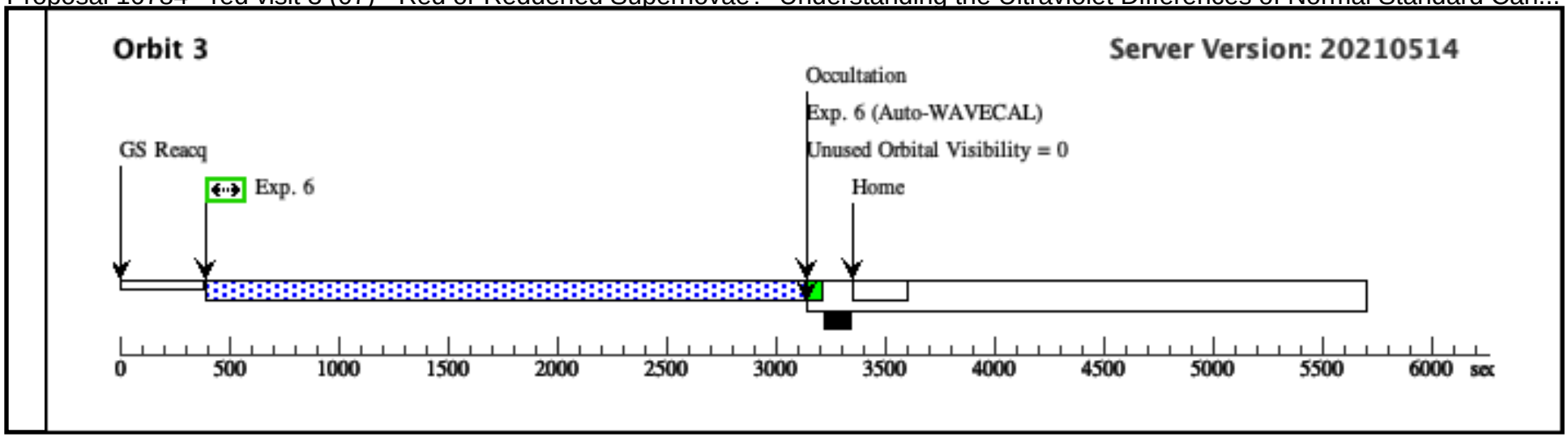
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	acq (1003284)	(2) REDSNIA-2	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	acq/peak (1003285)	(2) REDSNIA-2	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
3	nuvopt-stis (1003290)	(2) REDSNIA-2	STIS/CCD, ACCUM, 52X0.1E1	G430L 4300 A				800 Secs (864 Secs) *[==>432.0 Secs (Split 1)]* *[==>432.0 Secs (Split 2)]*	 ***[1]***
4	nuv-mama (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				800 Secs (832 Secs) *[==>832.0 Secs]*	 ***[1]***
5	nuv-mama2 (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				3000 Secs (2722 Secs) *[==>2722.0 Secs]*	 ***[2]***
6	nuv-mama3 (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				3000 Secs (2722 Secs) *[==>2722.0 Secs]*	 ***[3]***

Orbit Structure



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Visit

Proposal 16784, red visit 4 (08), implementation Fri Jul 30 18:08:35 GMT 2021

Diagnostic Status: No Diagnostics

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

Special Requirements: AFTER 07 BY 4 D TO 6 D; ON HOLD

On Hold Comments: ToO trigger

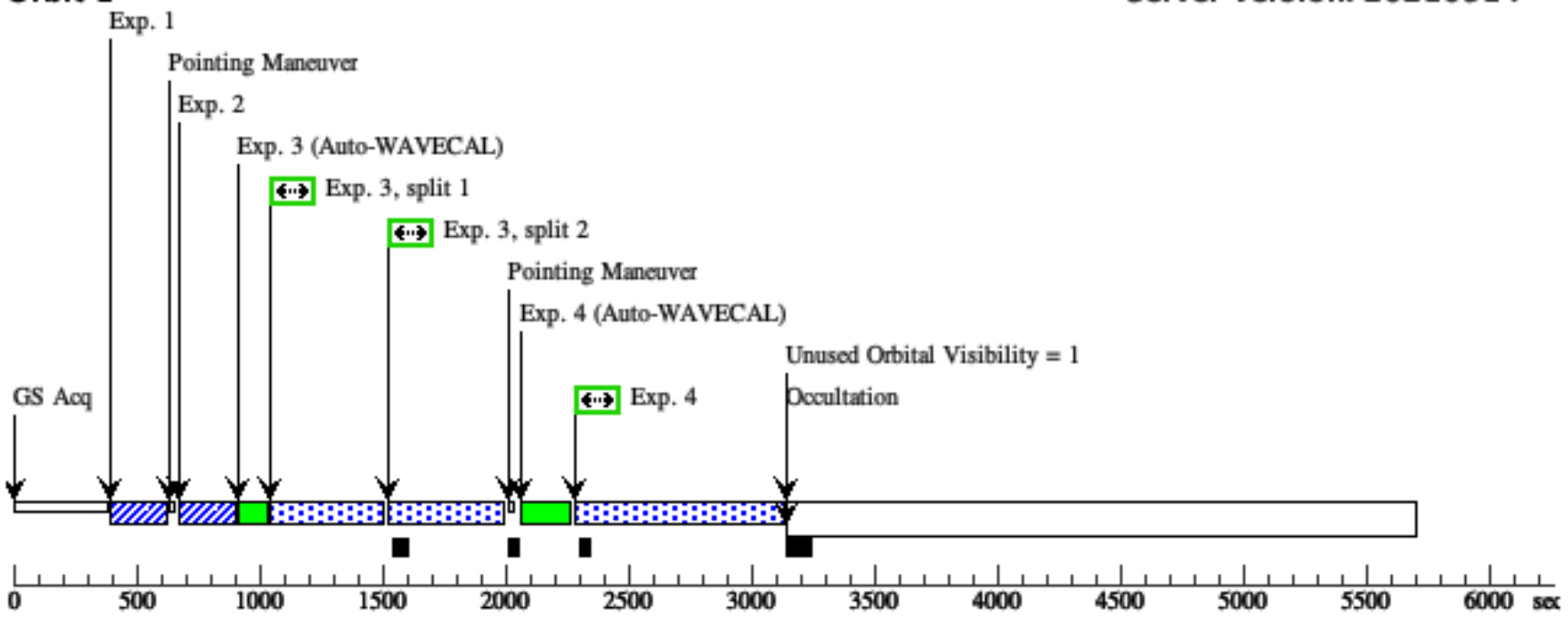
Generic Targets

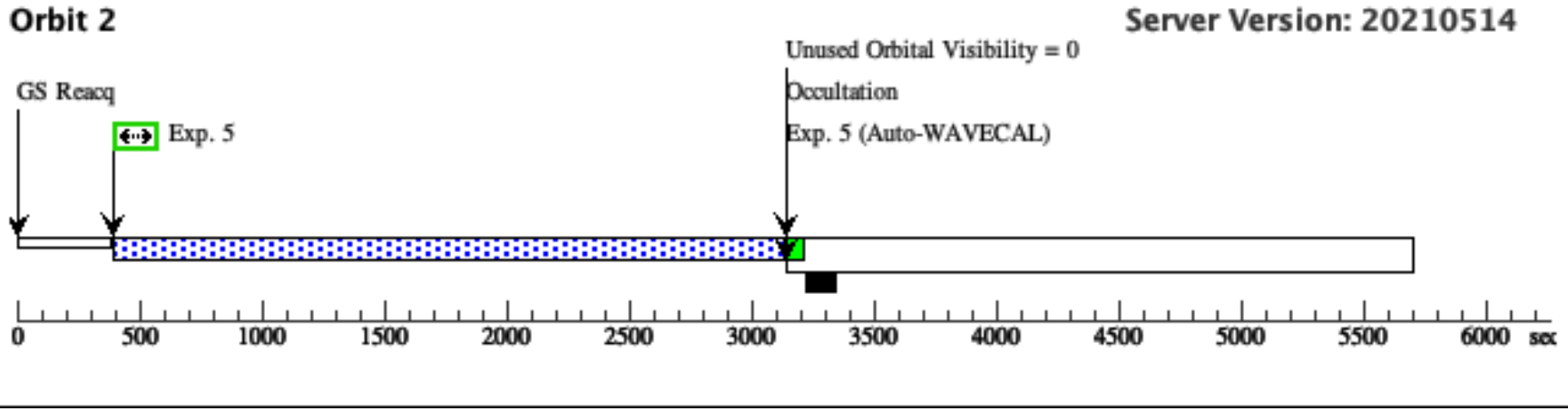
#	Name	Criteria	Description
(2)	REDSNIA-2	red supernova Ia	SUPERNOVA TYPE IA

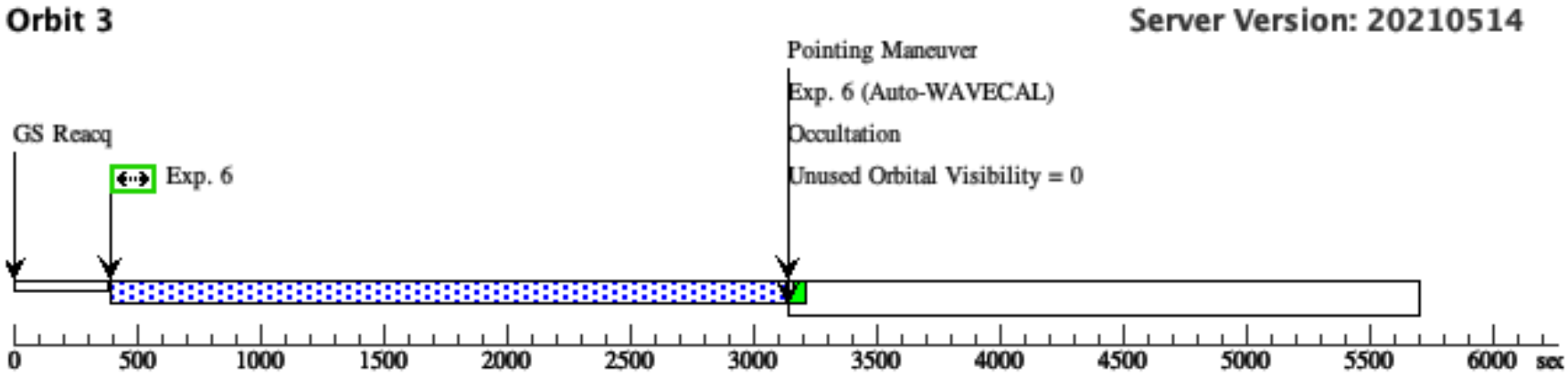
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	acq (1003284)	(2) REDSNIA-2	STIS/CCD, ACQ, F28X50LP	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
2	acq/peak (1003285)	(2) REDSNIA-2	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				1 Secs (1 Secs) *[==>]*	 ***[1]***
3	nuvopt-stis (1003290)	(2) REDSNIA-2	STIS/CCD, ACCUM, 52X0.1E1	G430L 4300 A				800 Secs (864 Secs) *[==>432.0 Secs (Split 1)]* *[==>432.0 Secs (Split 2)]*	 ***[1]***
4	nuv-mama (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				800 Secs (832 Secs) *[==>832.0 Secs]*	 ***[1]***
5	nuv-mama2 (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				3000 Secs (2722 Secs) *[==>2722.0 Secs]*	 ***[2]***
6	nuv-mama3 (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				3000 Secs (2722 Secs) *[==>2722.0 Secs]*	 ***[3]***
7	acq/peak (1003285)	(2) REDSNIA-2	STIS/CCD, ACQ/PEAK, 52X0.1E1	MIRROR				0.1 Secs (0.1 Secs) *[==>]*	 ***[4]***
8	nuv-mama4 (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				1200 Secs (2102 Secs) *[==>2102.0 Secs]*	 ***[4]***
9	nuv-mama5 (1003282)	(2) REDSNIA-2	STIS/NUV-MAMA, ACCUM, 52X0.1	G230L 2376 A				2500 Secs (2722 Secs) *[==>2722.0 Secs]*	 ***[5]***

Orbit Structure



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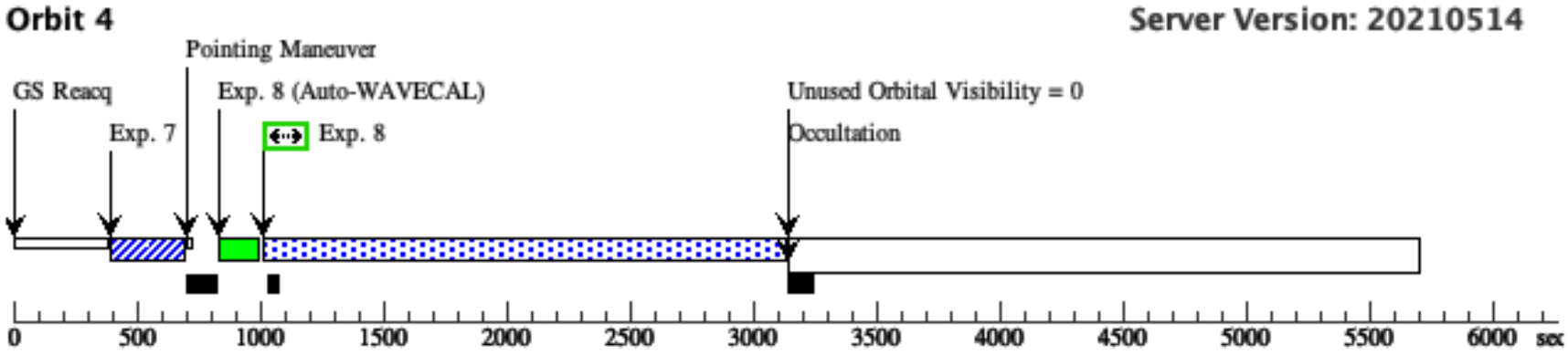
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Exp. 8
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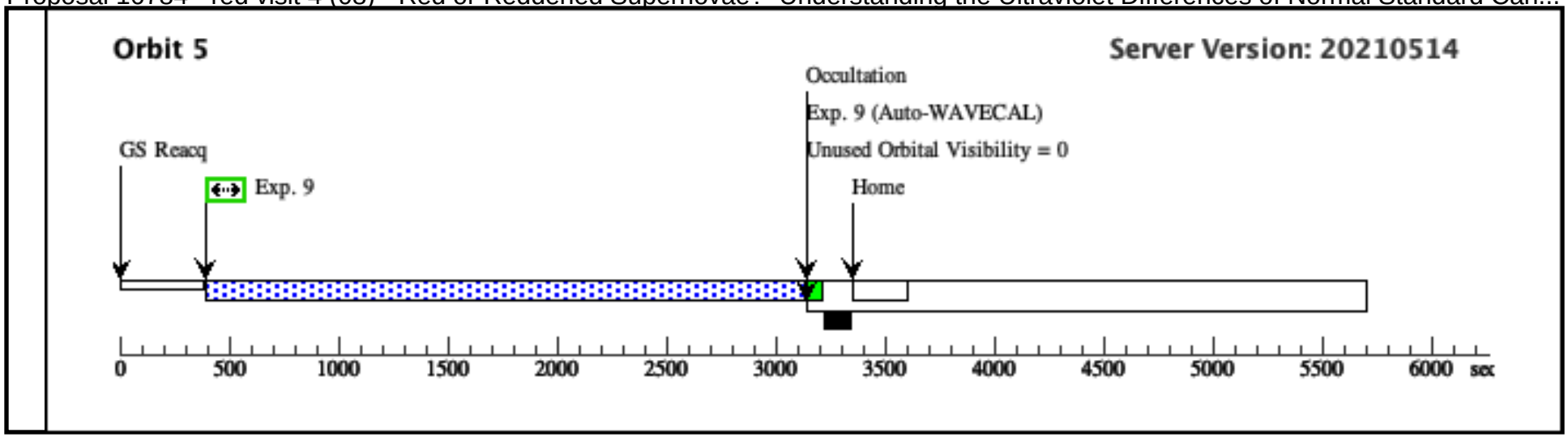
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Unused Orbital Visibility = 0
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Exp. 9
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