12222 - Constraints on Super/Hypernova Nucleosynthesis from the Hyper-Runaway Star HD271791

Cycle: 18, 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) HD271791	STIS/CCD STIS/FUV-MAMA STIS/NUV-MAMA	3	20-Jul-2011 01:08:04.0	yes

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
02	(1) HD271791	STIS/CCD STIS/NUV-MAMA	5	20-Jul-2011 01:08:14.0	yes
03	(1) HD271791	COS/FUV	4	20-Jul-2011 01:08:43.0	yes
52	(1) HD271791	STIS/CCD STIS/NUV-MAMA	5	20-Jul-2011 01:09:01.0	yes

17 Total Orbits Used

ABSTRACT

HD271791 is an extreme run-away star of B-type travelling so fast that it is likely to leave the Galaxy. We have shown that this star was ejected from the metal-poor outer rim of the Galaxy in a binary super- or hypernova. The star provides a unique opportunity to study the chemical composition of SN/HN ejecta, because nuclear-processed debris was deposited onto its surface in the course of the explosion. From optical spectra we have already demonstrated that the signature of the explosion is visible in its atmospheric abundance pattern, because the alpha-elements are enhanced. Our aim is to derive abundances for a large number of chemical elements, which are accessible only in the UV spectral range, to constrain the nucleosynthesis in the SN/HN in detail. If we succeed to detect tale-telling signatures of r-process elements in the UV spectrum, we may finally pin down the long-sought site of the r-process.

OBSERVING DESCRIPTION

Full spectral coverage of the NUV and FUV is required to achieve science goals, targeting as high S/N as possible in the STIS abd COS ranges. Target is rotating at about 120 km/s, post-observation binning can be applied to increase S/N.

Visit

Proposal 12222, Visit 01, completed Wed Jul 20 05:09:07 GMT 2011

Diagnostic Status: No Diagnostics

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

Special Requirements: (none)

Fixed Targets

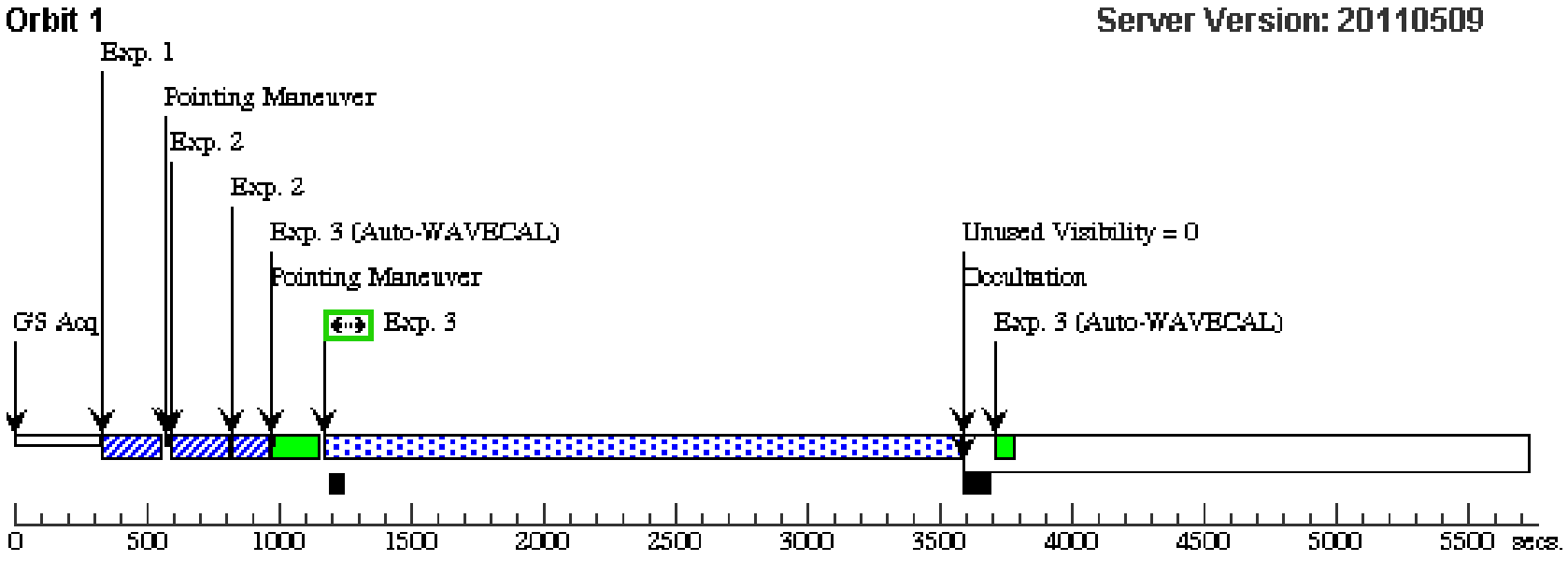
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD271791	RA: 06 02 27.8775 (90.6161562d) Dec: -66 47 28.66 (-66.79129d) Equinox: J2000	Radial Velocity: +441 km/sec	V=12.30+/-0.06 B-V=-0.10+/-0.03, E(B-V)=0.08, TYPE=B3	Reference Frame: ICRS

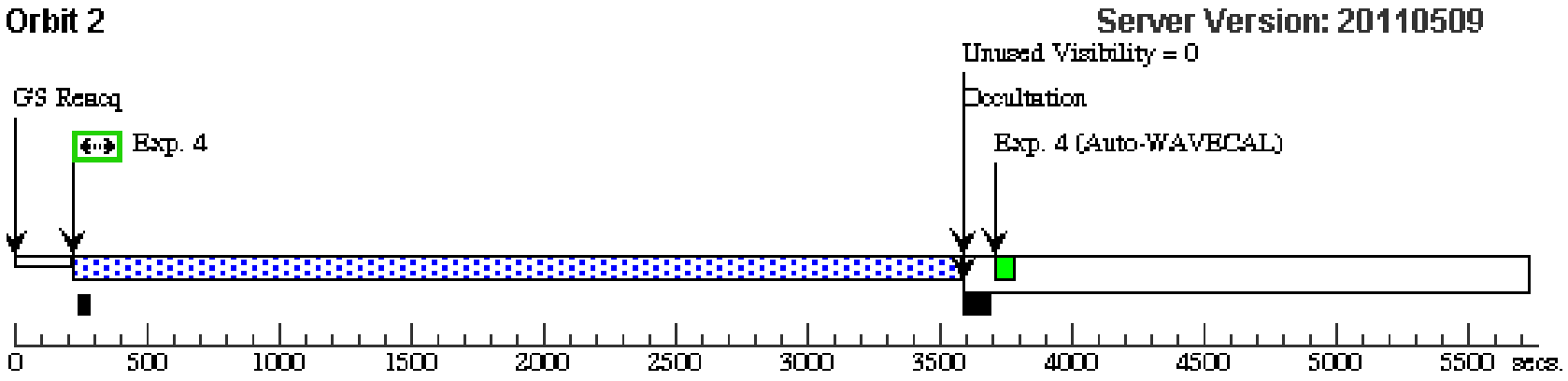
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

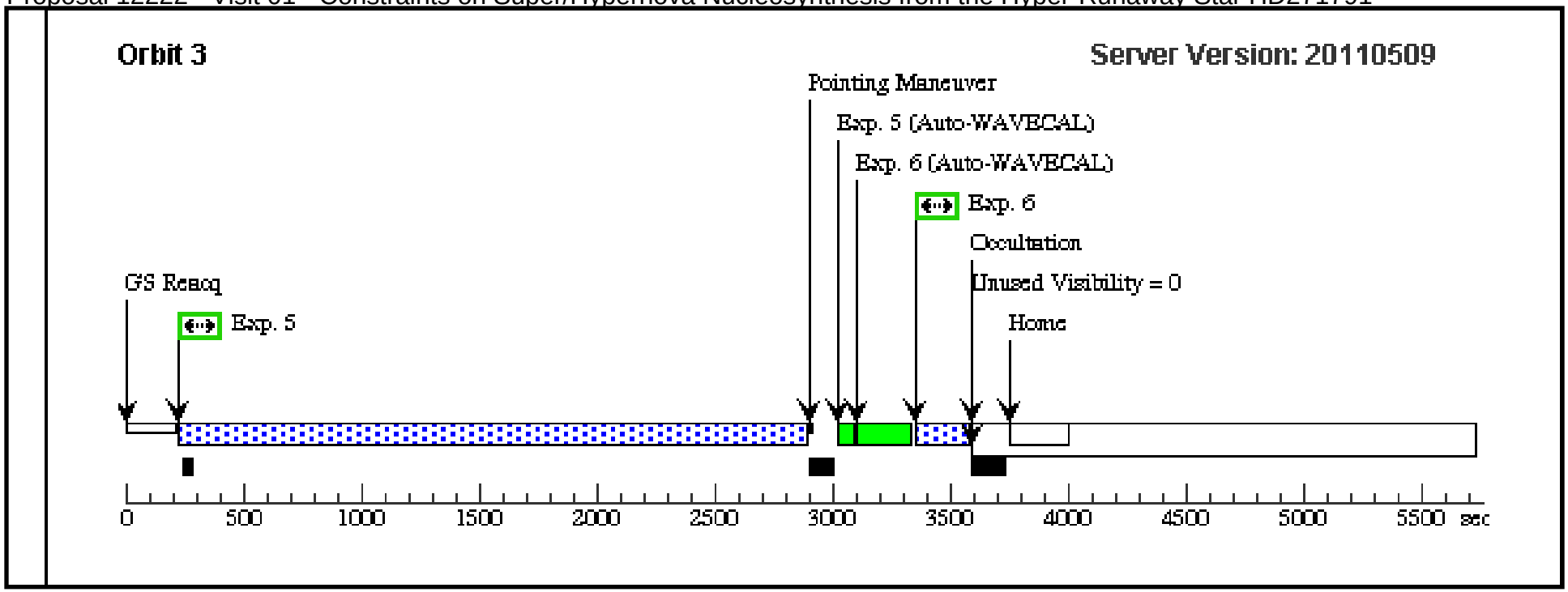
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	STISACQ	(1) HD271791	STIS/CCD, ACQ, F28X50LP	MIRROR				0.3 Secs *[==>]*	 ***[1]***
2	STISACQPK	(1) HD271791	STIS/CCD, ACQ/PEAK, 0.2X0.06	MIRROR				0.1 Secs *[==>]*	 ***[1]***
Comments: 19,000 electrons expected									
3	NUV2707	(1) HD271791	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 2707 A				2399 Secs *[==>]*	 ***[1]***
4	NUV2707	(1) HD271791	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 2707 A				3347 Secs *[==>]*	 ***[2]***
5	NUV2707	(1) HD271791	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 2707 A				2655 Secs *[==>]*	 ***[3]***
6	FUV1425LR	(1) HD271791	STIS/FUV-MAMA, ACCUM, 52X2	G140L 1425 A				180 Secs *[==>]*	 ***[3]***

Orbit Structure






Orbit 3
Server Version: 20110509
Pointing Maneuver
Exp. 5 (Auto-WAVECAL)
Exp. 6 (Auto-WAVECAL)
Exp. 6
Occultation
Unused Visibility = 0
GS Reacq
Exp. 5
Home
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500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12222, Visit 02, failed Wed Jul 20 05:09:08 GMT 2011

Diagnostic Status: No Diagnostics

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

Special Requirements: (none)

Fixed Targets

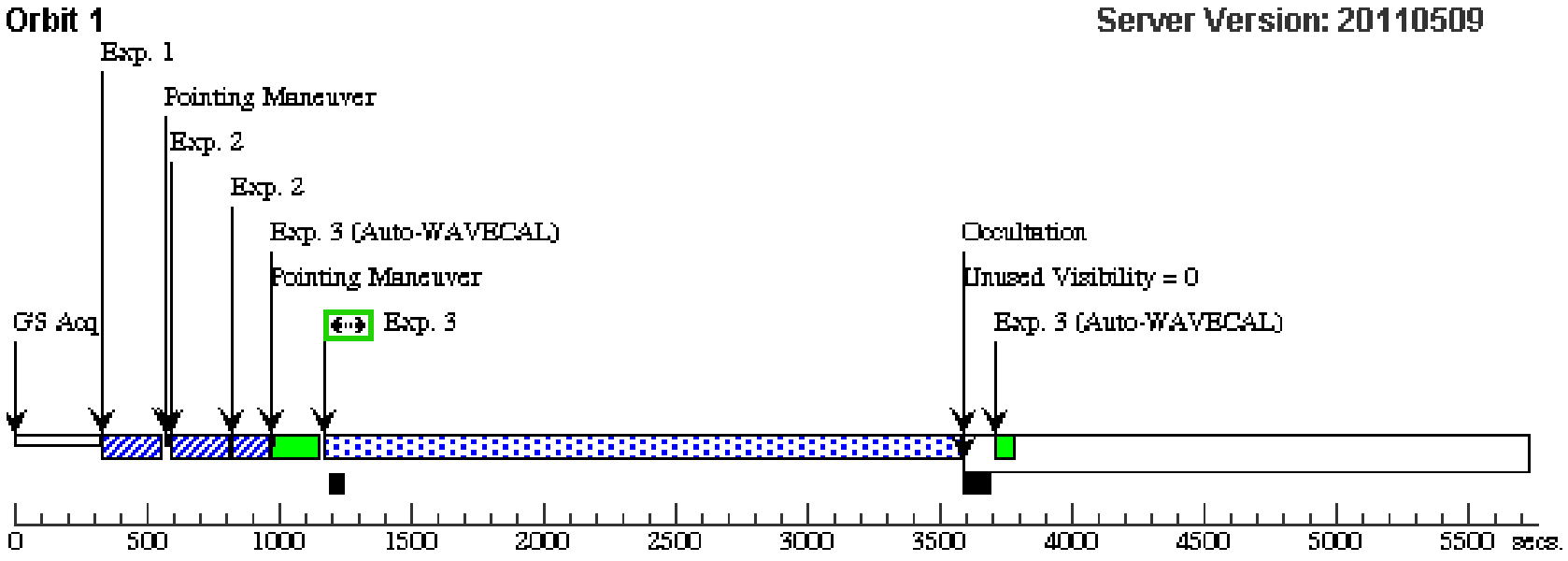
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD271791	RA: 06 02 27.8775 (90.6161562d) Dec: -66 47 28.66 (-66.79129d) Equinox: J2000	Radial Velocity: +441 km/sec	V=12.30+/-0.06 B-V=-0.10+/-0.03, E(B-V)=0.08, TYPE=B3	Reference Frame: ICRS

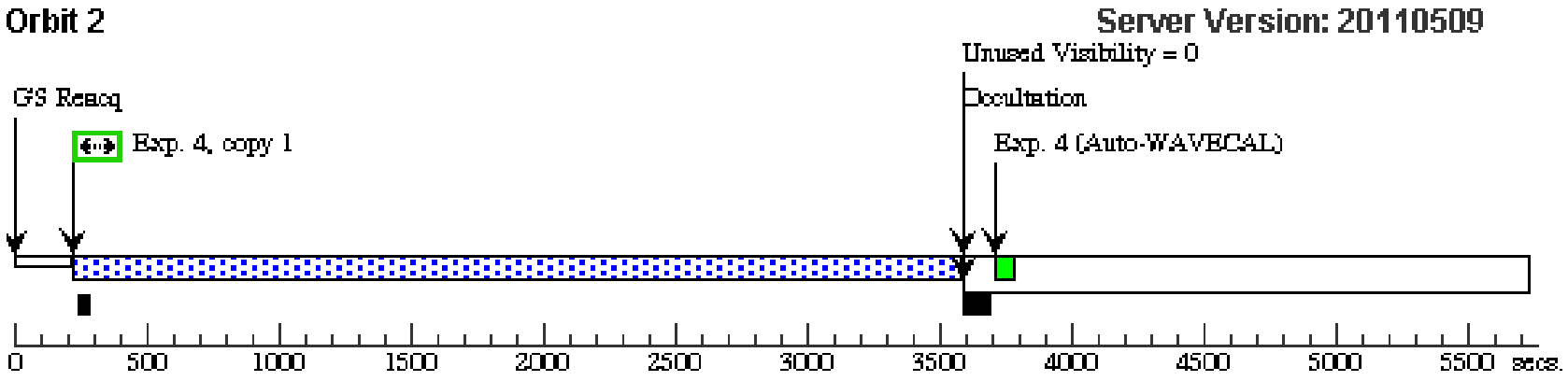
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

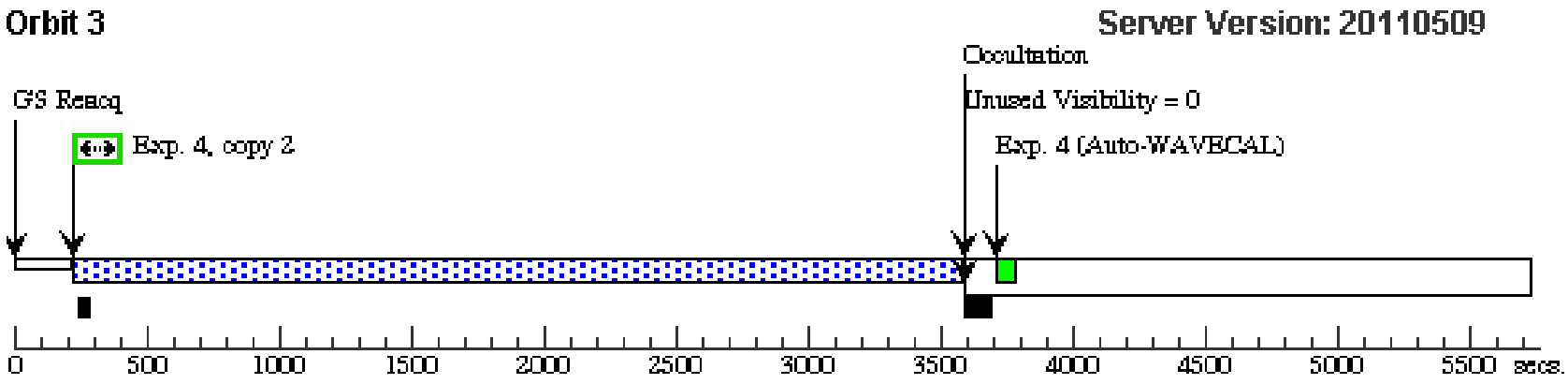
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	STISACQ	(1) HD271791	STIS/CCD, ACQ, F28X50LP	MIRROR				0.3 Secs	
								[==>]	***[1]***
2	STISACQPK	(1) HD271791	STIS/CCD, ACQ/PEAK, 0.2X0.06	MIRROR				0.1 Secs	
								[==>]	***[1]***
Comments: 19,000 electrons expected									
3	NUV1978	(1) HD271791	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 1978 A				2399 Secs	
								[==>]	***[1]***
4	NUV1978	(1) HD271791	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 1978 A				3347 Secs X 4	
								[==>(Copy 1)]	***[2]***
								[==>(Copy 2)]	***[3]***
								[==>(Copy 3)]	***[4]***
								[==>(Copy 4)]	***[5]***

Orbit Structure






Orbit 3
Server Version: 20110509
Occultation
GS Reacq
Unused Visibility = 0
Exp. 4, copy 2
Exp. 4 (Auto-WAVECAL)
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1000
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2000
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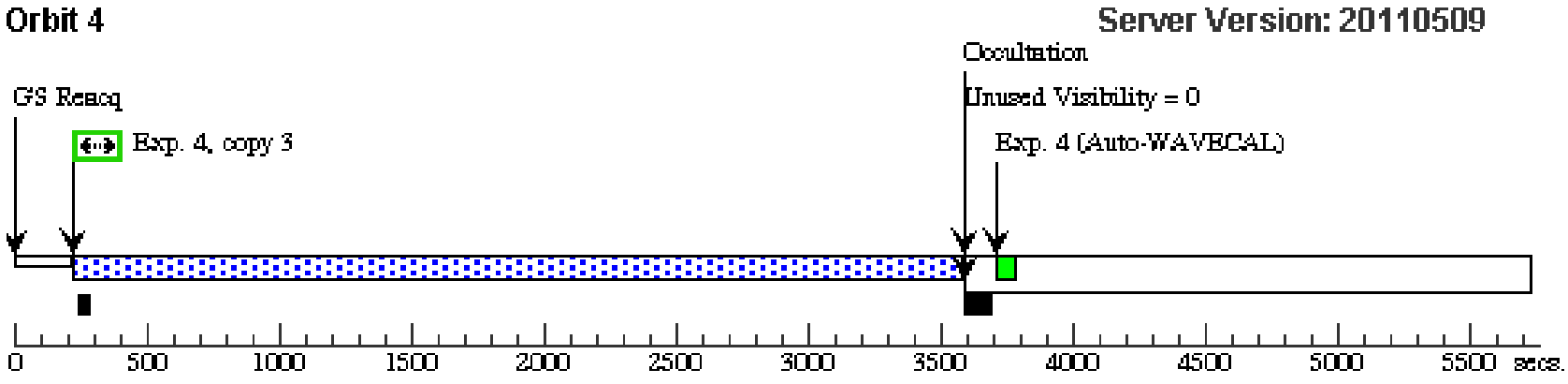
3000
3500
4000
4500
5000
5500
secs.


Orbit 4
Server Version: 20110509
Occultation
GS Reacq
Unused Visibility = 0
Exp. 4, copy 3
Exp. 4 (Auto-WAVECAL)
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1000
1500
2000
2500
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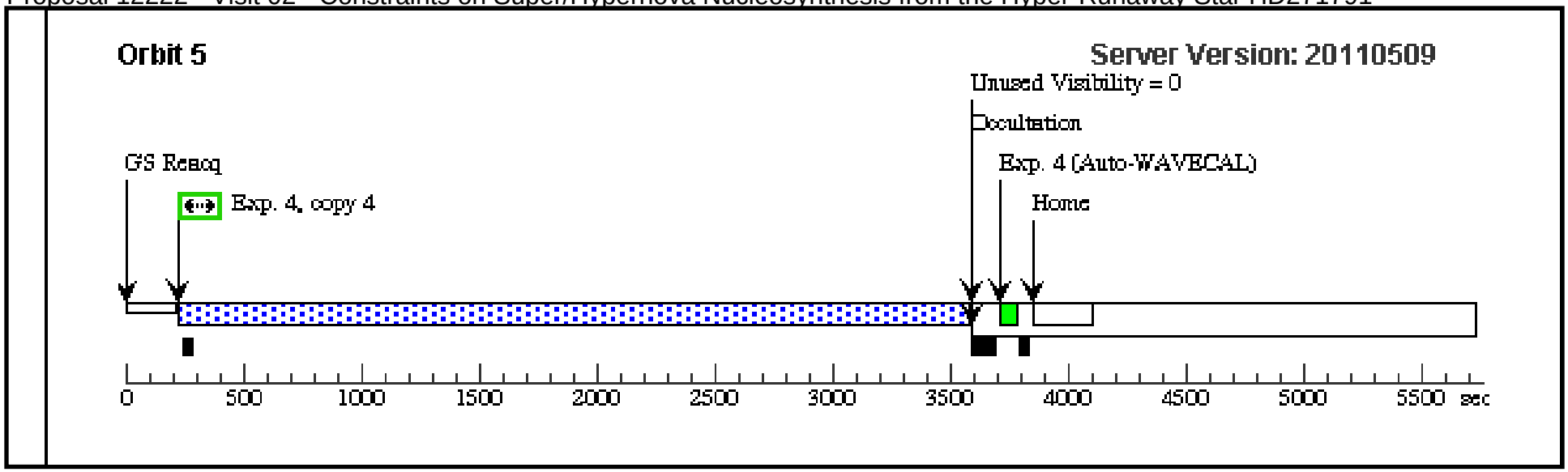
3500
4000
4500
5000
5500
secs.


Orbit 5
Server Version: 20110509
Unused Visibility = 0
Occultation
GS Reacq
Exp. 4, copy 4
Exp. 4 (Auto-WAVECAL)
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12222, Visit 03, implementation Wed Jul 20 05:09:09 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/FUV

Special Requirements: AFTER_01 BY 45 D TO 120 D

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD271791	RA: 06 02 27.8775 (90.6161562d) Dec: -66 47 28.66 (-66.79129d) Equinox: J2000	Radial Velocity: +441 km/sec	V=12.30+/-0.06 B-V=-0.10+/-0.03, E(B-V)=0.08, TYPE=B3	Reference Frame: ICRS

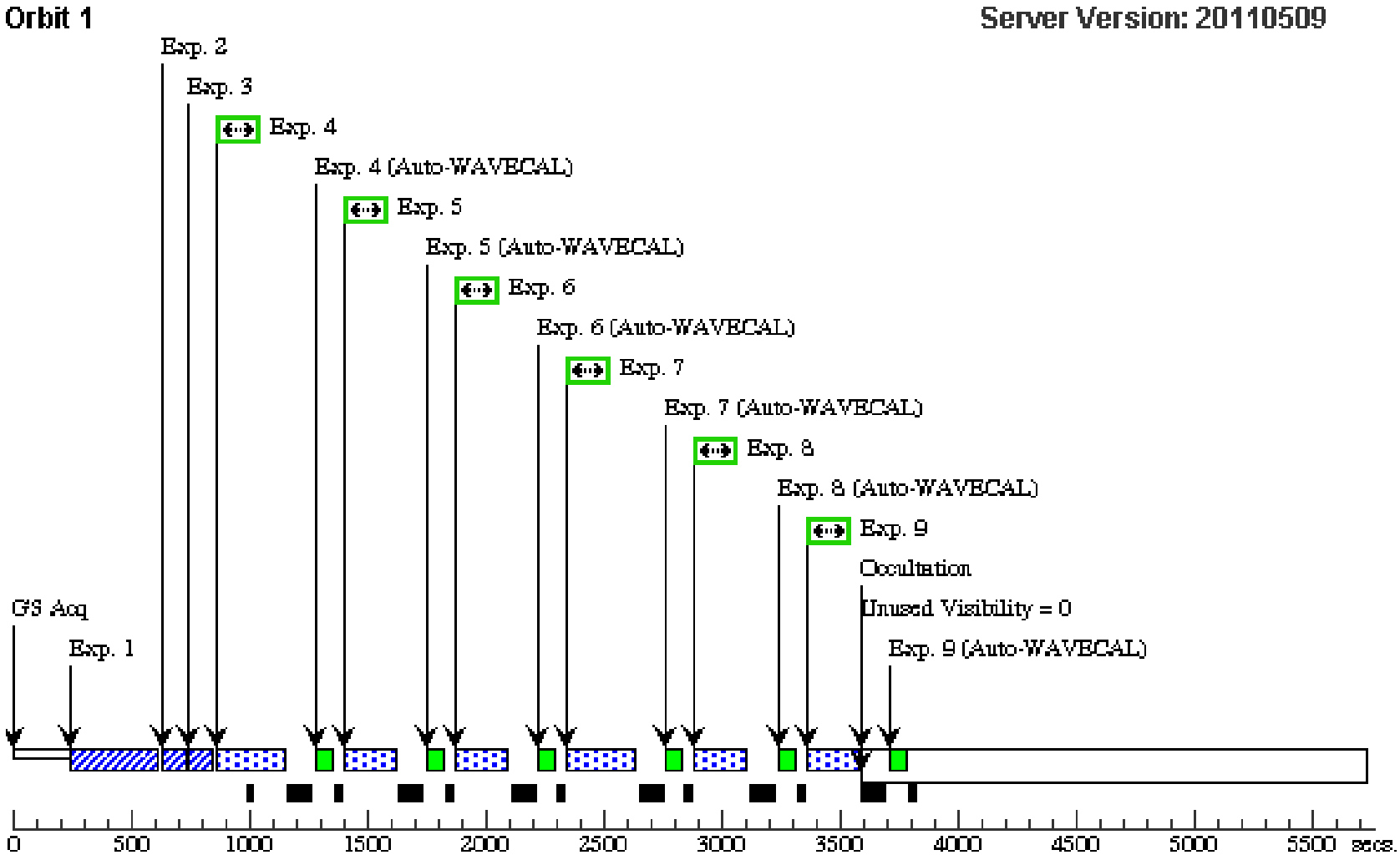
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

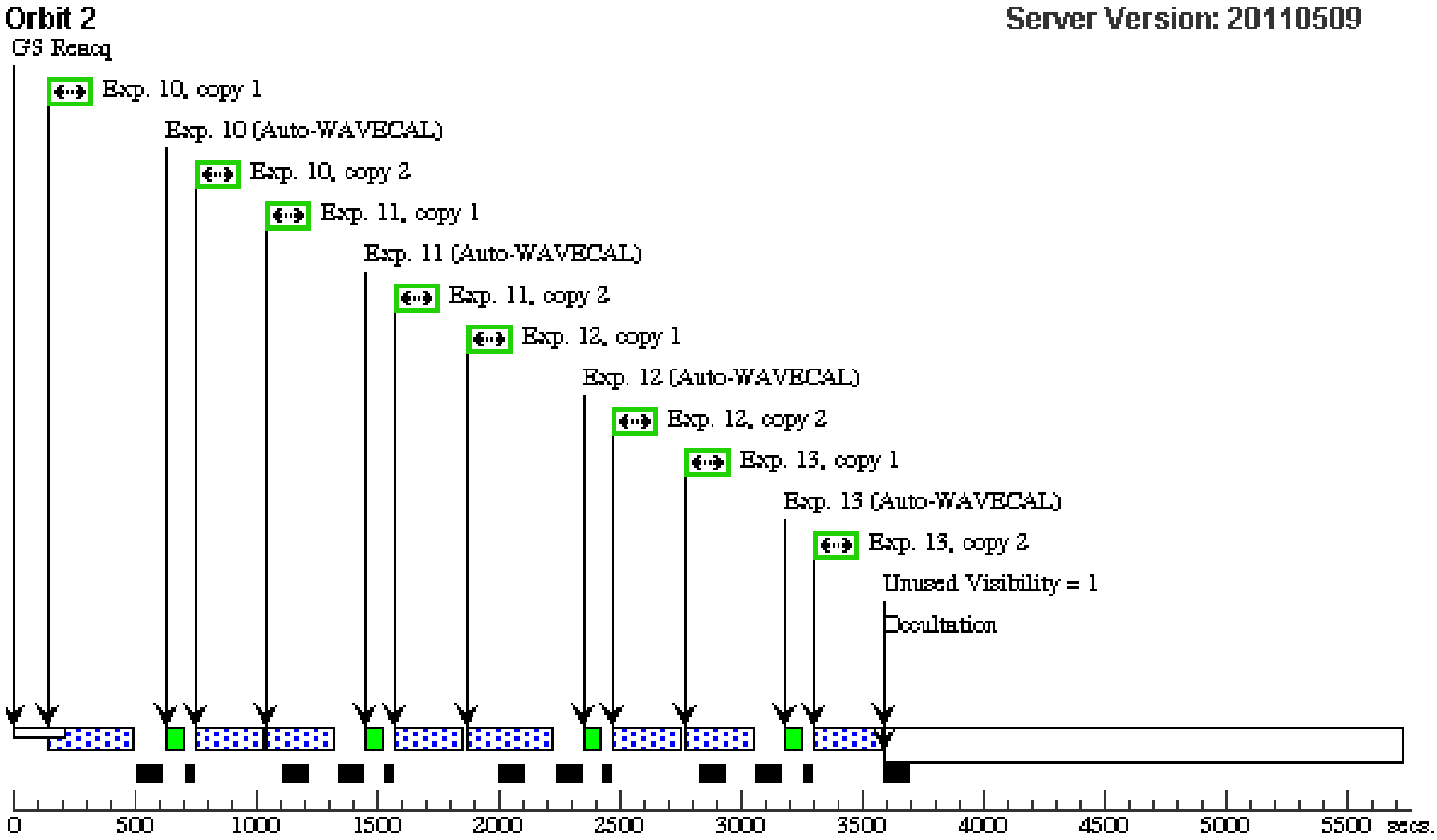
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	COSACQ1	(1) HD271791	COS/FUV, ACQ/SEARCH, PSA	G130M 1291 A	CENTER=FLUX-WT; SCAN-SIZE=3; STEP-SIZE=1.767			0.3 Secs *[==>]*	*[1]*
2	COSACQ2	(1) HD271791	COS/FUV, ACQ/PEAKXD, PSA	G130M 1291 A	SEGMENT=BOTH			0.3 Secs *[==>]*	*[1]*
3	COSACQ3	(1) HD271791	COS/FUV, ACQ/PEAKD, PSA	G130M 1291 A	CENTER=DEF; NUM-POS=3.0; SEGMENT=BOTH; STEP-SIZE=1.2			0.3 Secs *[==>]*	*[1]*
4	COS1309_1	(1) HD271791	COS/FUV, ACCUM, PSA	G130M 1309 A	FP-POS=1			164 Secs *[==>]*	*[1]*
5	_COS1309_2	(1) HD271791	COS/FUV, ACCUM, PSA	G130M 1309 A	FP-POS=2			165 Secs *[==>]*	*[1]*
6	COS1309_3	(1) HD271791	COS/FUV, ACCUM, PSA	G130M 1309 A	FP-POS=4			165 Secs *[==>]*	*[1]*
7	COS1318_1	(1) HD271791	COS/FUV, ACCUM, PSA	G130M 1318 A	FP-POS=1			164 Secs *[==>]*	*[1]*
8	COS1318_2	(1) HD271791	COS/FUV, ACCUM, PSA	G130M 1318 A	FP-POS=2			165 Secs *[==>]*	*[1]*
9	COS1318_3	(1) HD271791	COS/FUV, ACCUM, PSA	G130M 1318 A	FP-POS=4			165 Secs *[==>]*	*[1]*
10	COS1291_1	(1) HD271791	COS/FUV, ACCUM, PSA	G130M 1291 A	FP-POS=2			225 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	*[2]*
11	COS1291_2	(1) HD271791	COS/FUV, ACCUM, PSA	G130M 1291 A	FP-POS=4			225 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	*[2]*
12	COS1300_1	(1) HD271791	COS/FUV, ACCUM, PSA	G130M 1300 A	FP-POS=2			225 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	*[2]*
13	COS1300_2	(1) HD271791	COS/FUV, ACCUM, PSA	G130M 1300 A	FP-POS=4			225 Secs X 2 *[==>(Copy 1)]* *[==>(Copy 2)]*	*[2]*
14	COS1589	(1) HD271791	COS/FUV, TIME-TAG, PSA	G160M 1589 A	FLASH=YES; BUFFER-TIME=111			1504 Secs *[==>]*	*[3]*
15	COS1600	(1) HD271791	COS/FUV, TIME-TAG, PSA	G160M 1600 A	FLASH=YES; BUFFER-TIME=111			1504 Secs *[==>]*	*[3]*
16	COS1611	(1) HD271791	COS/FUV, TIME-TAG, PSA	G160M 1611 A	FLASH=YES; BUFFER-TIME=111			1504 Secs *[==>]*	*[4]*

	17	COS1623	(1) HD271791	COS/FUV, TIME-TAG, PSA	G160M 1623 A	FLASH=YES; BUFFER-TIME=111	1504 Secs *[==>]*	 ***[4]***

Orbit Structure

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Exp. 10, copy 2
Exp. 11, copy 1
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Exp. 11, copy 2
Exp. 12, copy 1
Exp. 12 (Auto-WAVECAL)
Exp. 12, copy 2
Exp. 13, copy 1
Exp. 13 (Auto-WAVECAL)
Exp. 13, copy 2
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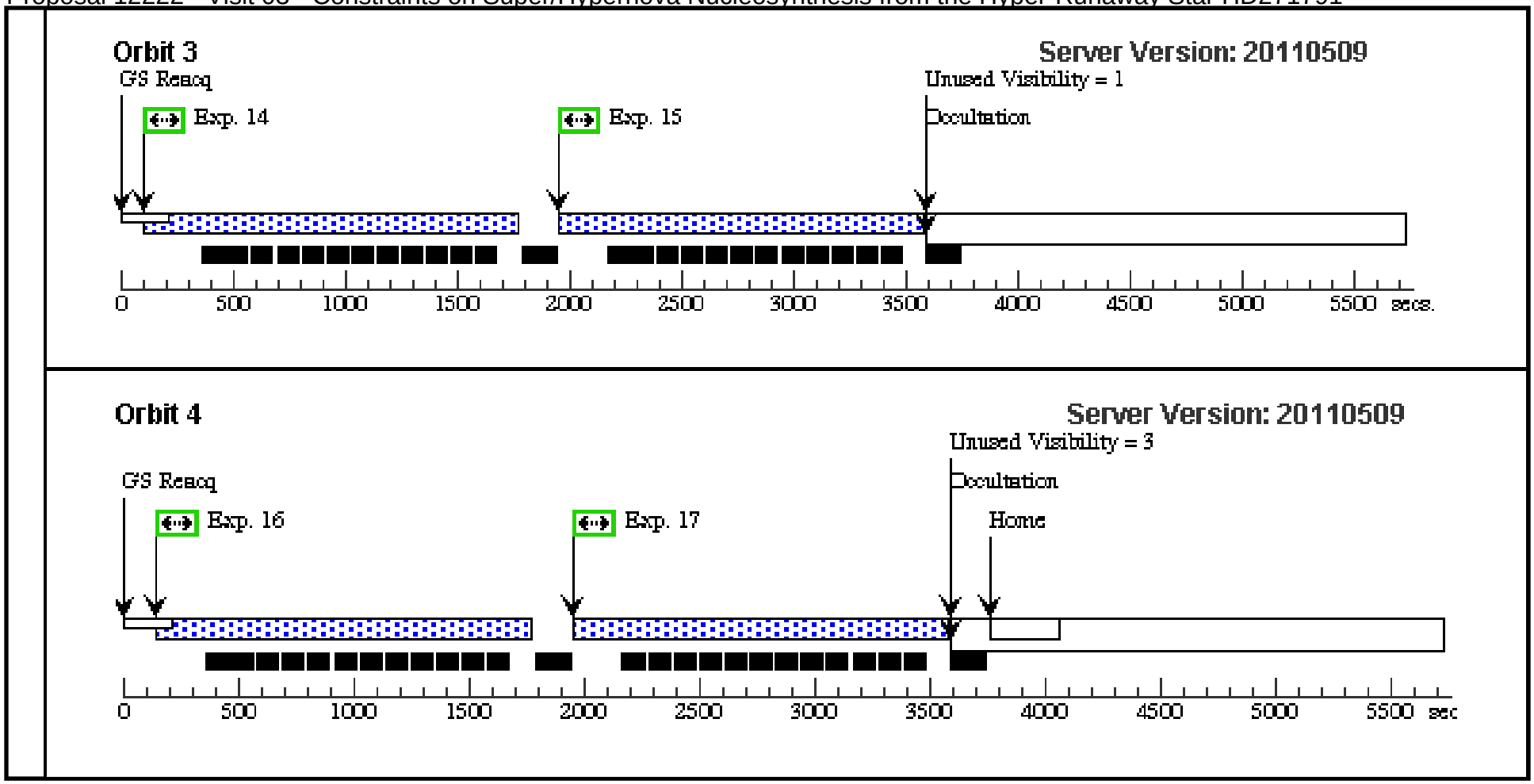
5000
5500
secs.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Server Version: 20110509
GS Reacq
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Exp. 15
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4000
4500
5000
5500
secs.
Orbit 4
Server Version: 20110509
Unused Visibility = 3
GS Reacq
Exp. 16
Exp. 17
Occultation
Home
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1000
1500
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2500
3000
3500
4000
4500
5000
5500

Visit

Proposal 12222, Visit 52, implementation Wed Jul 20 05:09:10 GMT 2011

Diagnostic Status: No Diagnostics

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

Special Requirements: (none)

Comments: This is an exact copy of visit 02 which failed.

Fixed Targets

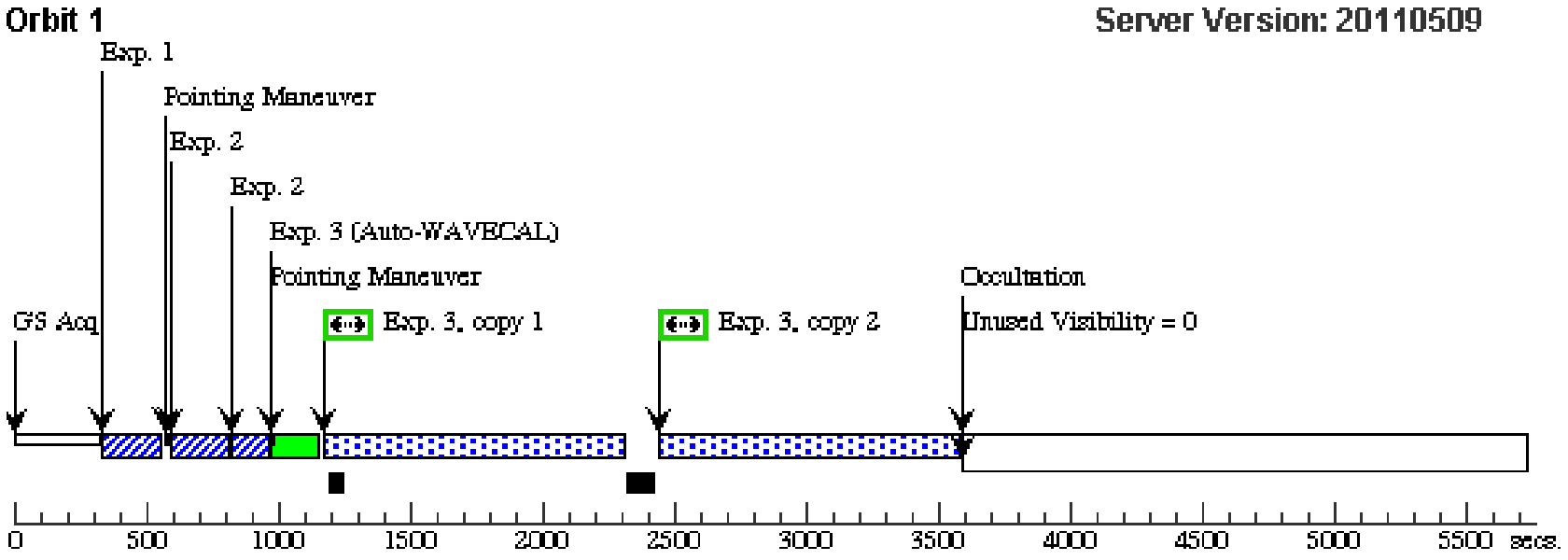
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD271791	RA: 06 02 27.8775 (90.6161562d) Dec: -66 47 28.66 (-66.79129d) Equinox: J2000	Radial Velocity: +441 km/sec	V=12.30+/-0.06 B-V=-0.10+/-0.03, E(B-V)=0.08, TYPE=B3	Reference Frame: ICRS

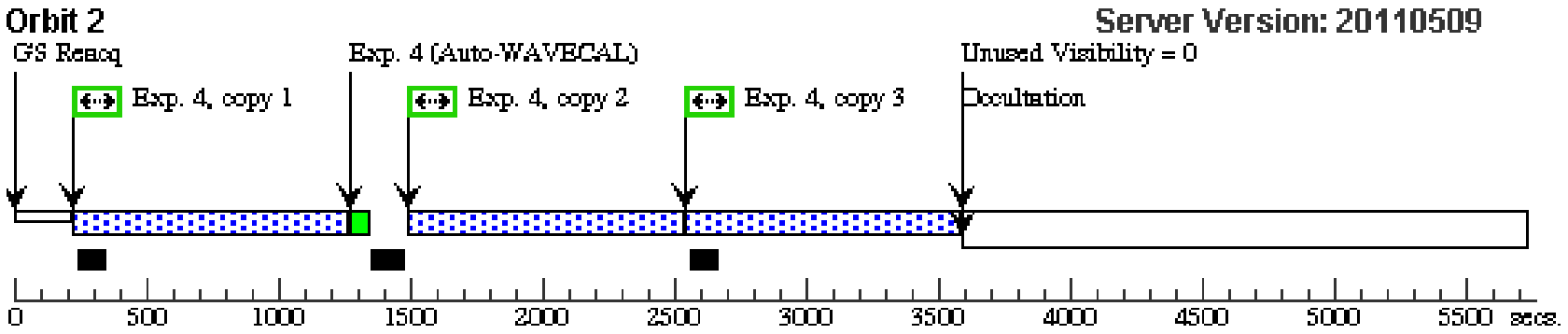
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

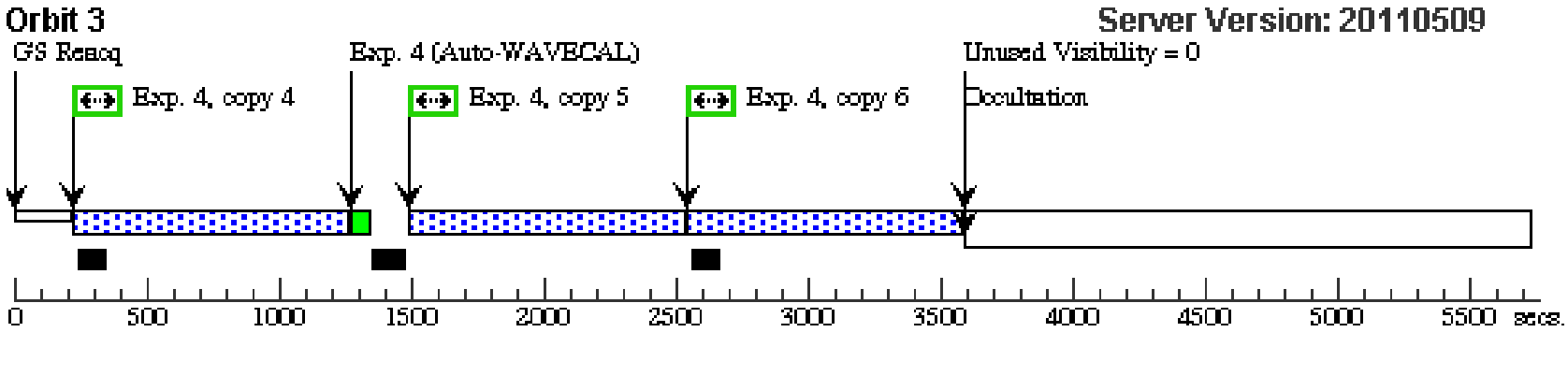
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	STISACQ	(1) HD271791	STIS/CCD, ACQ, F28X50LP	MIRROR				0.3 Secs	
								[==>]	***[1]***
2	STISACQPK	(1) HD271791	STIS/CCD, ACQ/PEAK, 0.2X0.06	MIRROR				0.1 Secs	
								[==>]	***[1]***
Comments: 19,000 electrons expected									
3	NUV1978	(1) HD271791	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 1978 A				1130 Secs X 2	
								[==>(Copy 1)] *[==>(Copy 2)]*	***[1]***
4	NUV1978	(1) HD271791	STIS/NUV-MAMA, ACCUM, 0.2X0.2	E230M 1978 A				1026 Secs X 12	
								[==>(Copy 1)] *[==>(Copy 2)]* *[==>(Copy 3)]*	***[2]***
								[==>(Copy 4)] *[==>(Copy 5)]* *[==>(Copy 6)]*	***[3]***
								[==>(Copy 7)] *[==>(Copy 8)]* *[==>(Copy 9)]*	***[4]***
								[==>(Copy 10)] *[==>(Copy 11)]* *[==>(Copy 12)]*	***[5]***

Orbit Structure



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GS Reacq
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Unused Visibility = 0
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Exp. 4, copy 5
Exp. 4, copy 6
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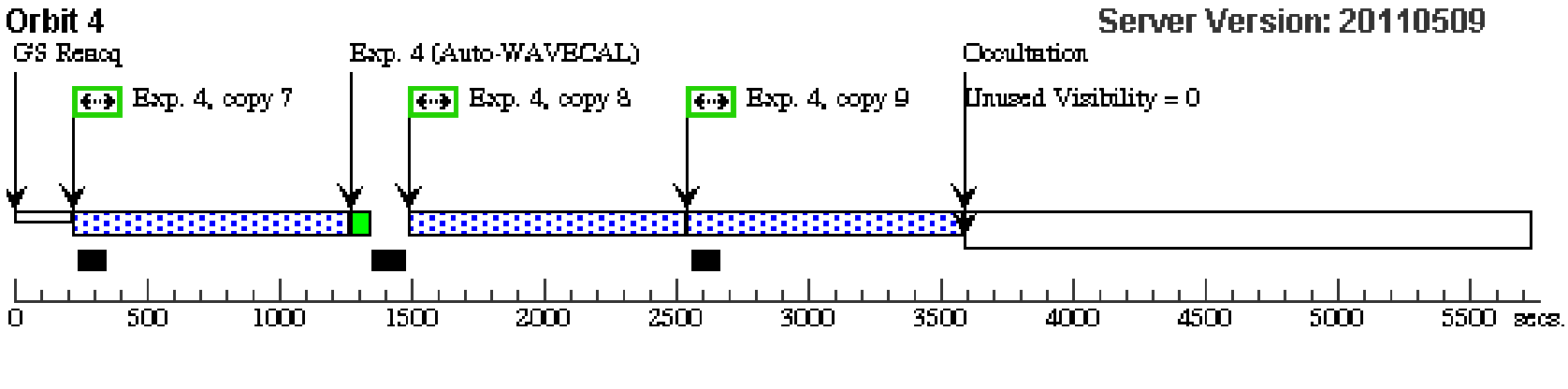
5000
5500
secs.


Orbit 4
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GS Reacq
Exp. 4 (Auto-WAVECAL)
Occultation
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Exp. 4, copy 8
Exp. 4, copy 9
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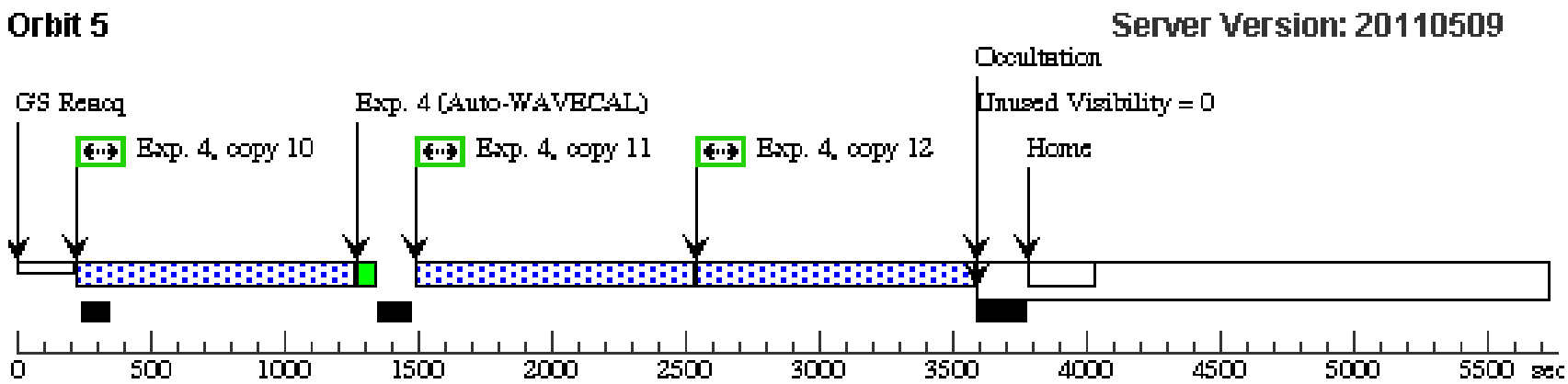
5000
5500
secs.


Orbit 5
Server Version: 20110509
Occultation
GS Reacq
Exp. 4 (Auto-WAVECAL)
Unused Visibility = 0
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Exp. 4, copy 11
Exp. 4, copy 12
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4000
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5500
sec