12191 - Prospecting for Rare Elements in the Interstellar Medium

Cycle: 18, Proposal Category: GO

(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?*
01	(1) HD99890	STIS/CCD STIS/NUV-MAMA	3	14-Jul-2010 21:04:37.0	yes
02	(1) HD99890	STIS/CCD STIS/FUV-MAMA	3	14-Jul-2010 21:04:48.0	yes
03	(1) HD99890	STIS/CCD STIS/FUV-MAMA	5	14-Jul-2010 21:05:01.0	yes
04	(2) HD232522	STIS/CCD STIS/NUV-MAMA	3	14-Jul-2010 21:05:19.0	yes
05	(2) HD232522	STIS/CCD STIS/FUV-MAMA	3	14-Jul-2010 21:05:31.0	yes
06	(2) HD232522	STIS/CCD STIS/FUV-MAMA	4	14-Jul-2010 21:05:45.0	yes

21 Total Orbits Used

ABSTRACT

The complex history and evolution of element production is reflected in the abundance ratios of the elements. The distinctive abundances patterns produced by nucleosynthesis in supernovae and stars can be used to explore the history of star formation and evolution in galaxies. Recent observations of damped Lyman-alpha systems have suggested that observations of r and s-process elements at high redshifts may soon provide a new window to explore chemical evolution. Paradoxically, we may soon have more detections of some elements in the interstellar medium of these high redshift galaxies than in the Galactic ISM. However, without an understanding of the depletion behavior of these elements based upon observations of nearby sightlines we may be unable to correctly disentangle the effects of dust depletion and nucleosynthesis. We therefore propose to determine the depletion of r and s-process elements in two sightlines with relatively mild depletion patterns on nearly opposite parts of the sky. In addition to providing a baseline for studies at high redshift, the long pathlength studied will enable us to search for abundance variations within our Galaxy.

OBSERVING DESCRIPTION

We will obtain very high S/N-ratio STIS observations of interstellar absorption lines toward the stars HD99890 and HD232522 using the E140H (centered at 1234 and 1416 Angstroms) and E230H (centered at 2013 Angstroms) echelle gratings. Our goal is to obtain sensitive measurements of the strengths of a large number of interstellar absorption lines, including lines of the dominent ionization state of the r and s-process elements Ga, Ge, As, Se, Kr, Cd, Sn and Pb toward these stars. The required resonance absorption lines for these elements are all in the (rest-frame) near-ultraviolet, and thus can only be studied with STIS . These are the exact same lines that have been used in recent QSO damped Lyman-alpha absorber studies, having been redshifted into the optical. Recent experience with FP-Splits and the STIS NUV-MAMA using the E230H grating centered at 2263 Angstroms to detect the weak carbon intersystem line at 2325 Angstroms shows that S/N-ratios greater than 200 are achievable (Sofia et al 2004) using this technique. Since our goal is to obtain spectra with S/N ratios that are between (approximately) 150 and 280 per resolution element at the

peak, and these are CVZ targets where the doppler induced spectral shifts are small (and therefor have less smoothing over the flat-field), we require the FP-Split slits to obtain the high S/N ratios needed to detect weak absorption features.

The minimum required S/N-ratios at each wavelength were determined by using the observed values of N(H) for these sightlines coupled with a Galactic ``warm cloud'' depletion pattern (Welty et al 1999) to predict the equivalent widths of numerous interstellar lines of interest. Note that in order to obtain the same relative gas-abundance sensitivity toward HD232522 we need only achieve 70% of the equivalent width (column density) sensitivity since the hydrogen column is 1.5 times higher towards this star then towards HD99890. HD99890 is approximately twice as bright as HD232522, so the same exposure time will yield the same relative abundance sensitivity for the two stars. To confidently detect our primary r and s-process species requires sensitivities of order 0.2-1.0 milli-Angstroms for the weakest lines. Using the desired sensitivities for all of the key r and s-process elements, we estimated the exposure times necessary to achieve the requisite S/N-ratios. We estimated that we would need at least 40,000 seconds per star, and using the given in Section 9 of the Cycle 13 Call for Proposals this implied we required 10 CVZ orbits per star, with 4, 3 and 3 CVZ orbits for the 1234, 1416 and 2013 Angstrom grating settings respectively. We then generated the actual exposure times obtainable in 3 or 4 orbits and feed these back into the simulator to confirm that we achieved the final S/N-ratios and sensitivities in the proposal.

ADDITIONAL COMMENTS

The Phase-1 tools yielded multiple CVZ windows for each target -- using the CVZ tables we estimated that there would be 6 windows for HD99890 with about 170 total orbits, and 3 or 4 windows for HD232522 with about 120 total orbits available. Unfortunately it appears that the values yielded by these tools were somewhat over-optimistic, and that we cannot get the full 96 minutes of exposure time for a CVZ orbit for HD232522. Discussions with our Program Coordinator (Tony Roman) suggest that we will be able to obtain 93 minutes on-target per orbit for this star, which is sufficient to achieve our objectives.

Visit

Proposal 12191, Visit 01 Thu Jul 15 01:05:51 GMT 2010

Diagnostic Status: No Diagnostics

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

Special Requirements: CVZ

Fixed Targets

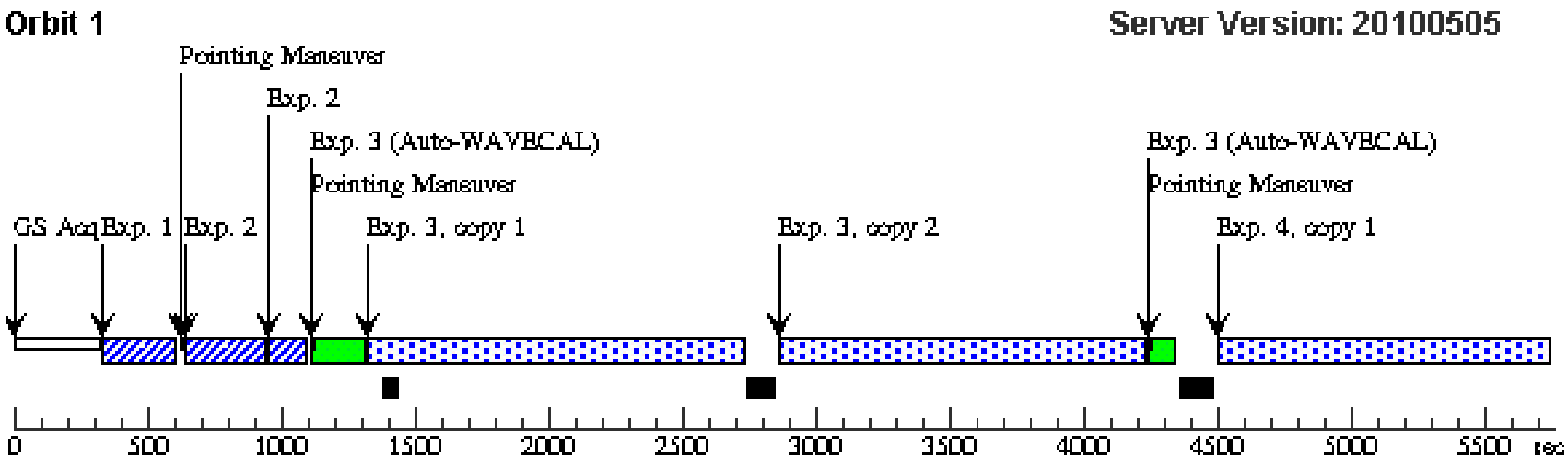
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD99890 Alt Name1: HIP56036	RA: 11 29 5.7548 (172.2739783d) Dec: -56 38 39.31 (-56.64425d) Equinox: J2000	Proper Motion RA: 0.0s/yr Proper Motion Dec: 0.0042"/yr Epoch of Position: 1991.25	V=8.28 E(B-V)=0.20, F(1321)=2.3e-11, F(1433)=2.2e-11, F(2145)=9e-12	Reference Frame: ICRS

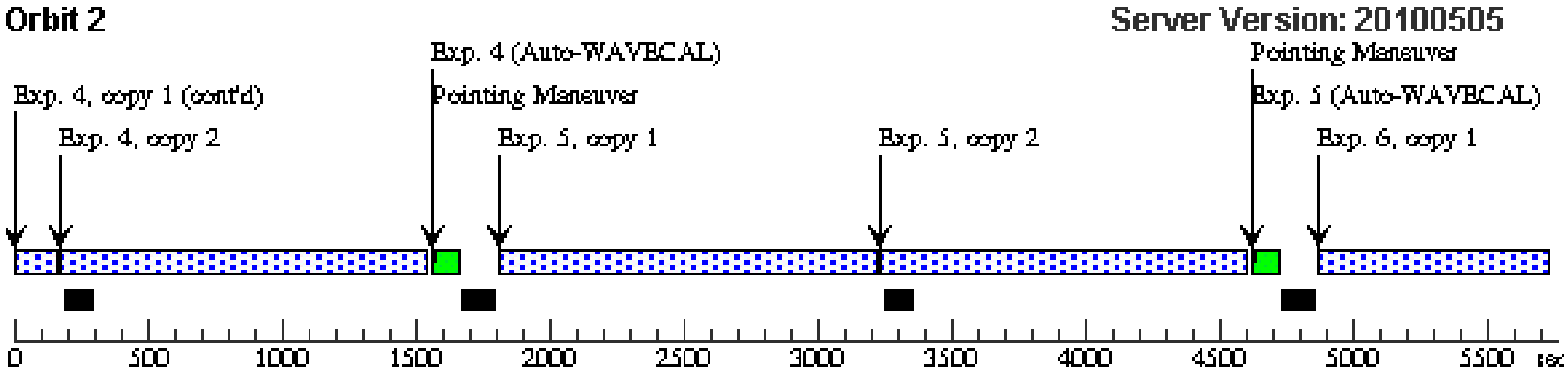
Comments: The ultra-violet fluxes listed are based upon archival IUE low resolution, large aperture data and (where available) STIS observations taken through the 0.2"x0.2" slit. The wavelengths listed are in the vicinity of key spectral features, and are representative of the fluxes measured in the wavelength interval covered by the three grating settings.

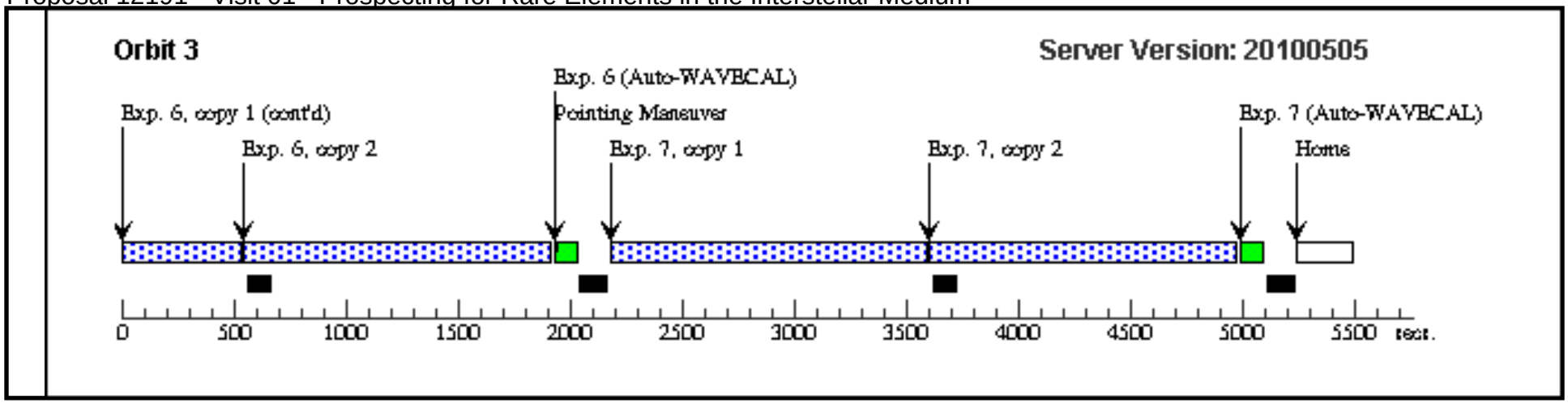
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	HD99890-ACQ	(1) HD99890	STIS/CCD, ACQ, F28X50OIII	MIRROR				1.0 Secs	
								[==>]	***[1]***
2	HD99890-ACQ/PEAK	(1) HD99890	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.5 Secs	
								[==>]	***[1]***
3		(1) HD99890	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPA	E230H 2013 A				1360.0 Secs X 2	
								[==>(Copy 1)] *[==>(Copy 2)]*	***[1]***
4		(1) HD99890	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPB	E230H 2013 A				1360.0 Secs X 2	
								[==>(Copy 1)]	***[1]***
								[==>(Copy 2)]	***[2]***
5		(1) HD99890	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPC	E230H 2013 A				1360.0 Secs X 2	
								[==>(Copy 1)] *[==>(Copy 2)]*	***[2]***
6		(1) HD99890	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPD	E230H 2013 A				1360.0 Secs X 2	
								[==>(Copy 1)]	***[2]***
								[==>(Copy 2)]	***[3]***
7		(1) HD99890	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPE	E230H 2013 A				1360.0 Secs X 2	
								[==>(Copy 1)] *[==>(Copy 2)]*	***[3]***

Orbit Structure



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Exp. 6, copy 2
Exp. 6 (Auto-WAVECAL)
Pointing Maneuver
Exp. 7, copy 1
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Exp. 7 (Auto-WAVECAL)
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Visit

Proposal 12191, Visit 02 Thu Jul 15 01:05:53 GMT 2010

Diagnostic Status: No Diagnostics

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

Special Requirements: CVZ

Fixed Targets

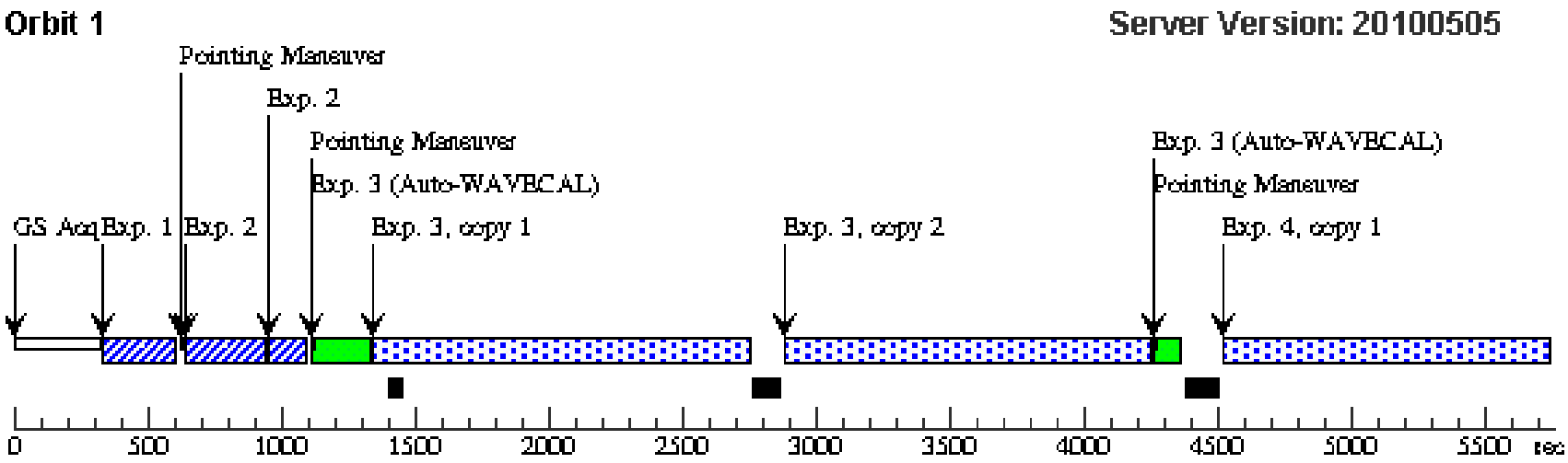
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD99890	RA: 11 29 5.7548 (172.2739783d)	Proper Motion RA: 0.0s/yr	V=8.28	Reference Frame: ICRS
	Alt Name1: HIP56036	Dec: -56 38 39.31 (-56.64425d)	Proper Motion Dec: 0.0042"/yr	E(B-V)=0.20,	
		Equinox: J2000	Epoch of Position: 1991.25	F(1321)=2.3e-11,	
				F(1433)=2.2e-11,	
				F(2145)=9e-12	

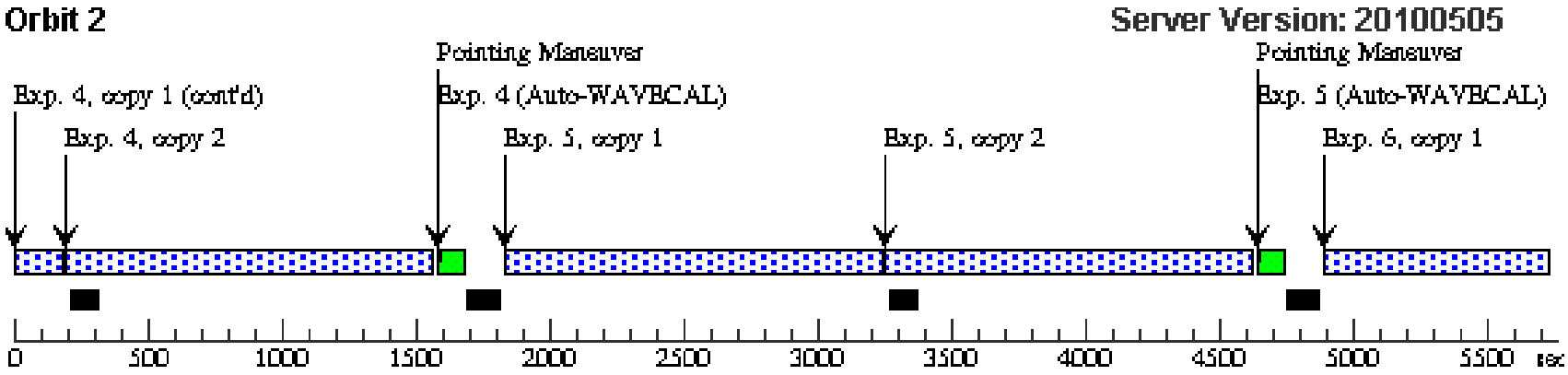
Comments: The ultra-violet fluxes listed are based upon archival IUE low resolution, large aperture data and (where available) STIS observations taken through the 0.2"x0.2" slit. The wavelengths listed are in the vicinity of key spectral features, and are representative of the fluxes measured in the wavelength interval covered by the three grating settings.

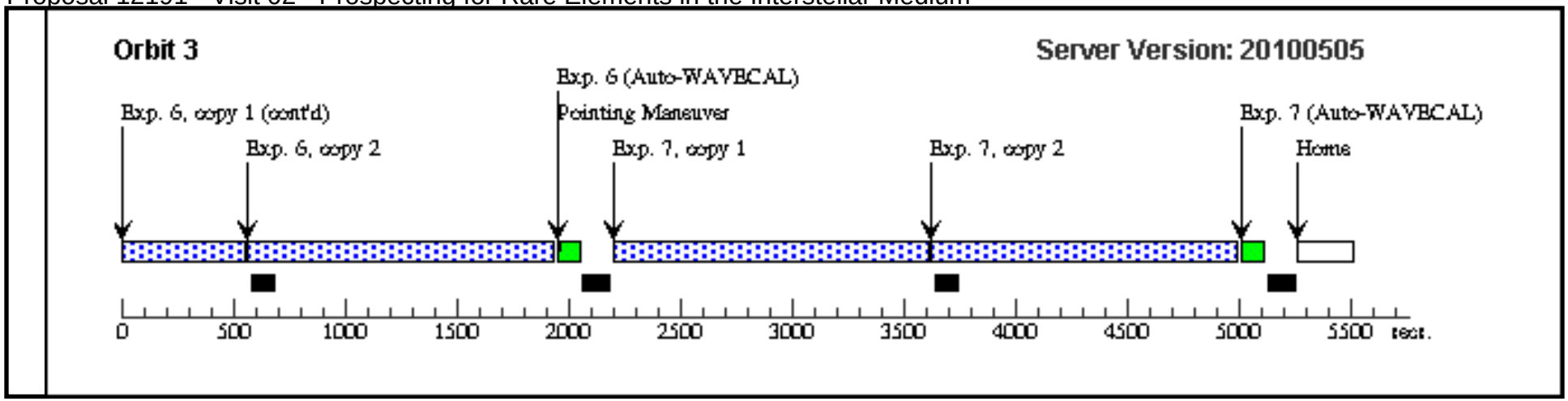
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	HD99890-ACQ	(1) HD99890	STIS/CCD, ACQ, F28X50OIII	MIRROR				1.0 Secs	
								[==>]	***[1]***
2	HD99890-ACQ/PEAK	(1) HD99890	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.5 Secs	
								[==>]	***[1]***
3		(1) HD99890	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPA	E140H 1416 A				1360.0 Secs X 2	
								[==>(Copy 1)] *[==>(Copy 2)]*	***[1]***
4		(1) HD99890	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPB	E140H 1416 A				1360.0 Secs X 2	
								[==>(Copy 1)]	***[1]***
								[==>(Copy 2)]	***[2]***
5		(1) HD99890	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPC	E140H 1416 A				1360.0 Secs X 2	
								[==>(Copy 1)] *[==>(Copy 2)]*	***[2]***
6		(1) HD99890	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPD	E140H 1416 A				1360.0 Secs X 2	
								[==>(Copy 1)]	***[2]***
								[==>(Copy 2)]	***[3]***
7		(1) HD99890	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPE	E140H 1416 A				1360.0 Secs X 2	
								[==>(Copy 1)] *[==>(Copy 2)]*	***[3]***

Orbit Structure



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Exp. 6, copy 2
Exp. 6 (Auto-WAVECAL)
Pointing Maneuver
Exp. 7, copy 1
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Exp. 7 (Auto-WAVECAL)
Home
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Visit

Proposal 12191, Visit 03 Thu Jul 15 01:05:54 GMT 2010

Diagnostic Status: No Diagnostics

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

Special Requirements: CVZ

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HD99890 Alt Name1: HIP56036	RA: 11 29 5.7548 (172.2739783d) Dec: -56 38 39.31 (-56.64425d) Equinox: J2000	Proper Motion RA: 0.0s/yr Proper Motion Dec: 0.0042"/yr Epoch of Position: 1991.25	V=8.28 E(B-V)=0.20, F(1321)=2.3e-11, F(1433)=2.2e-11, F(2145)=9e-12	Reference Frame: ICRS

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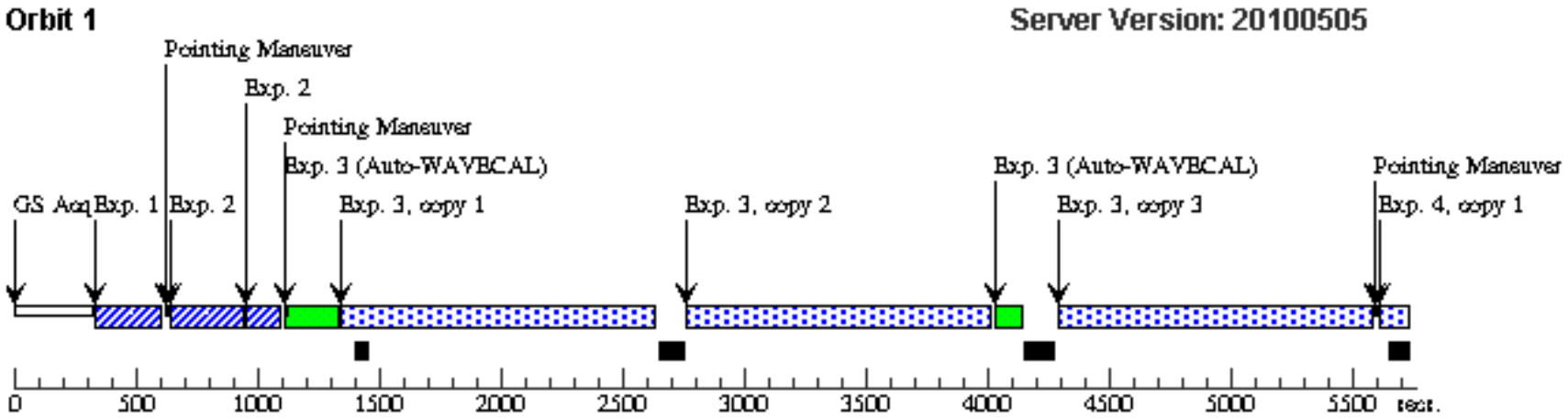
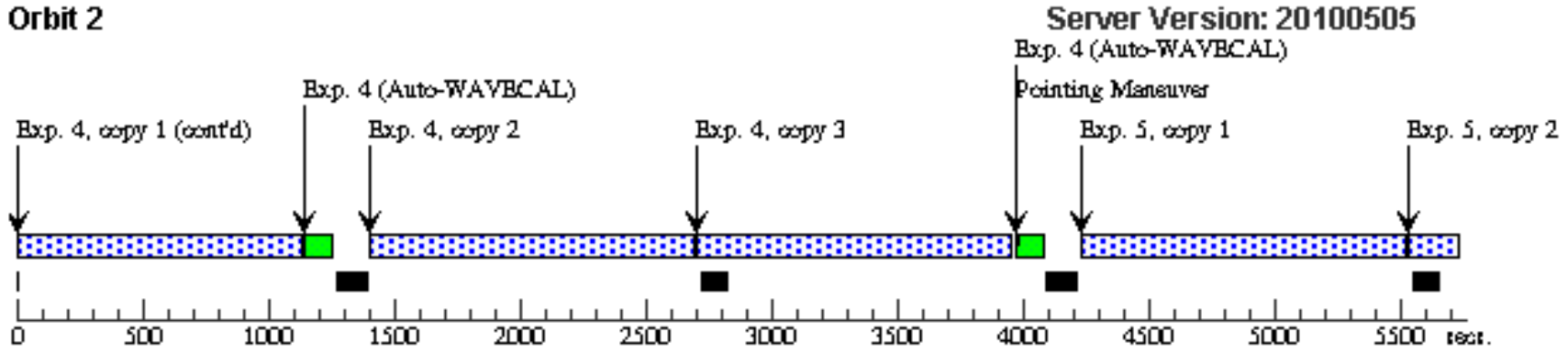
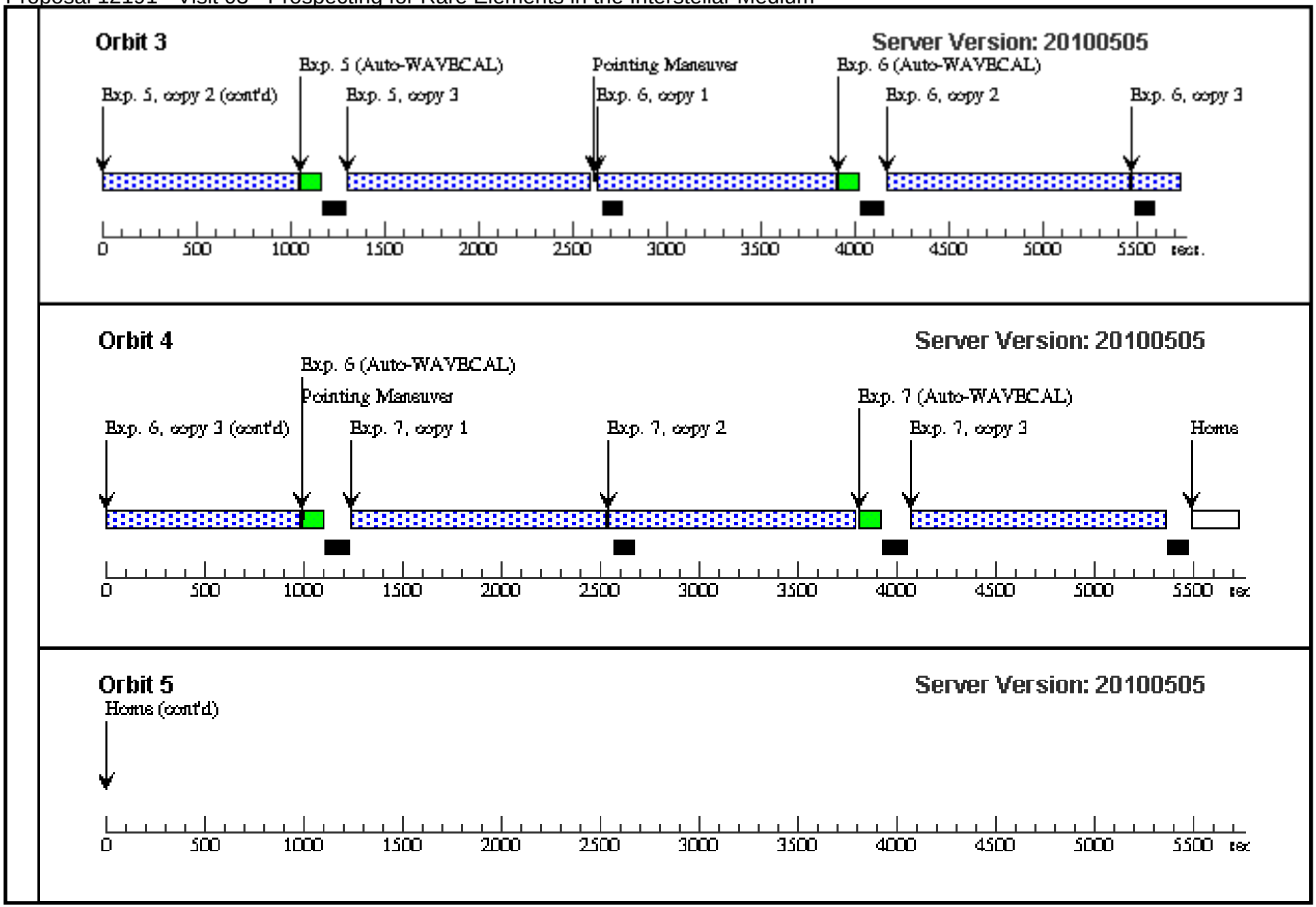
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	HD99890-ACQ	(1) HD99890	STIS/CCD, ACQ, F28X50OIII	MIRROR				1.0 Secs *[==>]*	*[1]*
2	HD99890-ACQ/PEAK	(1) HD99890	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.5 Secs *[==>]*	*[1]*
3		(1) HD99890	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPA	E140H 1234 A				1240.0 Secs X 3 *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]*	*[1]*
4		(1) HD99890	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPB	E140H 1234 A				1240.0 Secs X 3 *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]*	*[1]* *[2]*
5		(1) HD99890	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPC	E140H 1234 A				1240.0 Secs X 3 *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]*	*[2]* *[3]*
6		(1) HD99890	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPD	E140H 1234 A				1240.0 Secs X 3 *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]*	*[3]*
7		(1) HD99890	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPE	E140H 1234 A				1240.0 Secs X 3 *[==>(Copy 1)]* *[==>(Copy 2)]* *[==>(Copy 3)]*	*[4]*

Orbit Structure



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Exp. 6, copy 2
Exp. 6, copy 3
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Orbit 4
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Exp. 6 (Auto-WAVECAL)
Pointing Maneuver
Exp. 7, copy 1
Exp. 7, copy 2
Exp. 7 (Auto-WAVECAL)
Exp. 7, copy 3
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Server Version: 20100505
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Visit

Proposal 12191, Visit 04 Thu Jul 15 01:05:55 GMT 2010

Diagnostic Status: No Diagnostics

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

Special Requirements: VISIBILITY INTERVAL 93.0 M

Fixed Targets

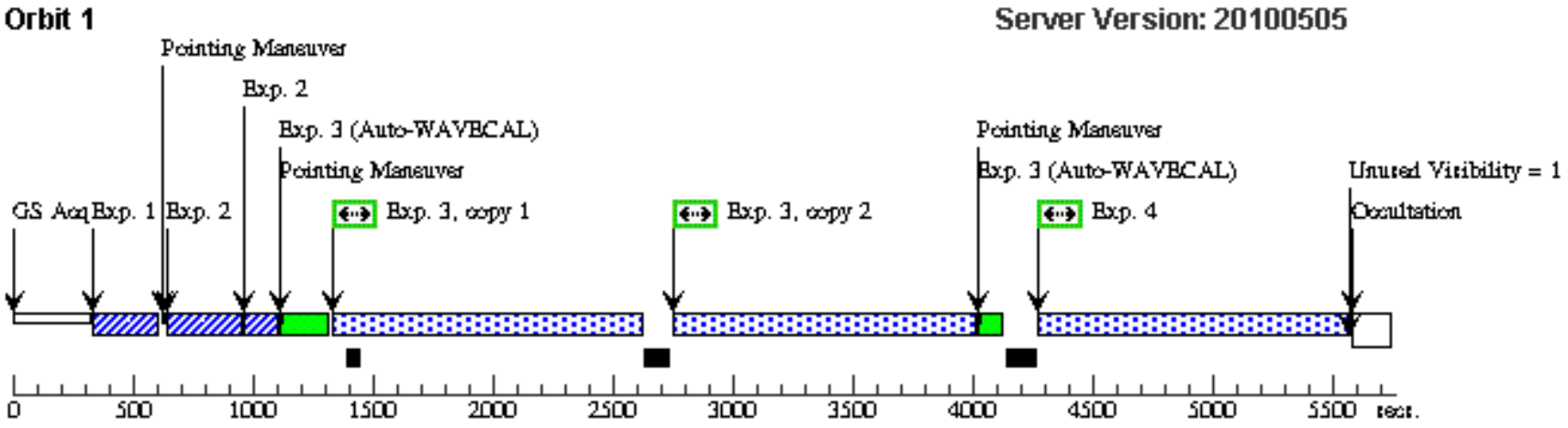
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HD232522	RA: 01 46 2.1900 (26.5091250d)	Proper Motion RA: 0.0s/yr	V=8.7	Reference Frame: ICRS
	Alt Name1: HIP8235	Dec: +55 19 54.90 (55.33192d)	Proper Motion Dec: -0.0018"/yr	E(B-V)=0.18,	
		Equinox: J2000	Epoch of Position: 1991.25	F(1321)=1.0e-11,	
				F(1433)=9.7e-12,	
				F(2145)=3.8e-12	

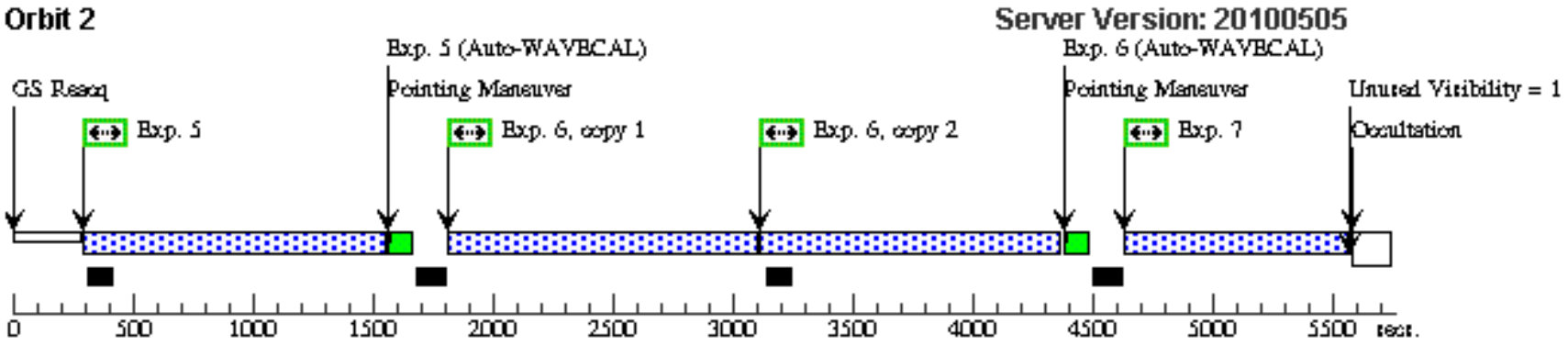
Comments: The ultra-violet fluxes listed are based upon archival IUE low resolution, large aperture data and (where available) STIS observations taken through the 0.2"x0.2" slit. The wavelengths listed are in the vicinity of key spectral features, and are representative of the fluxes measured in the wavelength interval covered by the three grating settings.

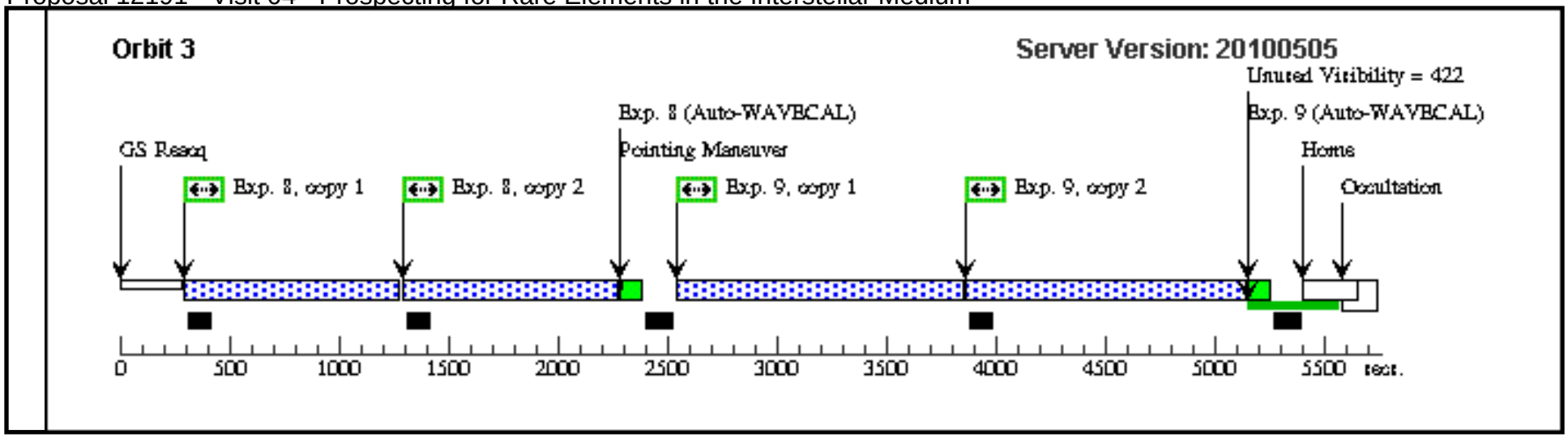
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	HD232522-ACQ	(2) HD232522	STIS/CCD, ACQ, F28X50OIII	MIRROR				1.7 Secs	
								[==>]	***[1]***
2	HD232522-ACQ/PEAK	(2) HD232522	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.7 Secs	
								[==>]	***[1]***
3		(2) HD232522	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPA	E230H 2013 A				1228.0 Secs X 2	
								[==>1245.0 Secs (Copy 1)] *[==>1245.0 Secs (Copy 2)]*	***[1]***
4		(2) HD232522	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPB	E230H 2013 A				1220.0 Secs	
								[==>1237.0 Secs]	***[1]***
5		(2) HD232522	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPB	E230H 2013 A				1242.0 Secs	
								[==>1242.0 Secs]	***[2]***
6		(2) HD232522	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPC	E230H 2013 A				1242.0 Secs X 2	
								[==>1242.0 Secs (Copy 1)] *[==>1242.0 Secs (Copy 2)]*	***[2]***
7		(2) HD232522	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPD	E230H 2013 A				826.0 Secs	
								[==>874.0 Secs]	***[2]***
8		(2) HD232522	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPD	E230H 2013 A				986.0 Secs X 2	
								[==>972.0 Secs (Copy 1)] *[==>972.0 Secs (Copy 2)]*	***[3]***
9		(2) HD232522	STIS/NUV-MAMA, ACCUM, 0.2X0.2FPE	E230H 2013 A				1240 Secs X 2	
								[==>1264.0 Secs (Copy 1)] *[==>1264.0 Secs (Copy 2)]*	***[3]***

Orbit Structure



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Exp. 9 (Auto-WAVECAL)
GS Reacq
Pointing Maneuver
Home
Occultation
Exp. 8, copy 1
Exp. 8, copy 2
Exp. 9, copy 1
Exp. 9, copy 2
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Visit

Proposal 12191, Visit 05 Thu Jul 15 01:05:56 GMT 2010

Diagnostic Status: No Diagnostics

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

Special Requirements: VISIBILITY INTERVAL 93.0 M

Fixed Targets

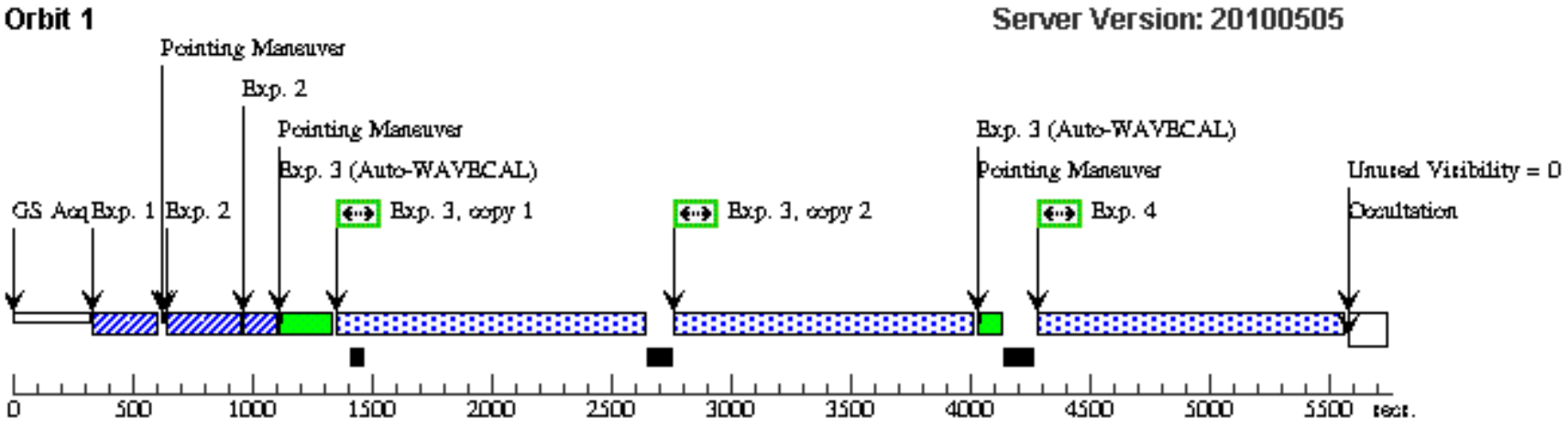
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HD232522	RA: 01 46 2.1900 (26.5091250d)	Proper Motion RA: 0.0s/yr	V=8.7	Reference Frame: ICRS
	Alt Name1: HIP8235	Dec: +55 19 54.90 (55.33192d)	Proper Motion Dec: -0.0018"/yr	E(B-V)=0.18,	
		Equinox: J2000	Epoch of Position: 1991.25	F(1321)=1.0e-11,	
				F(1433)=9.7e-12,	
				F(2145)=3.8e-12	

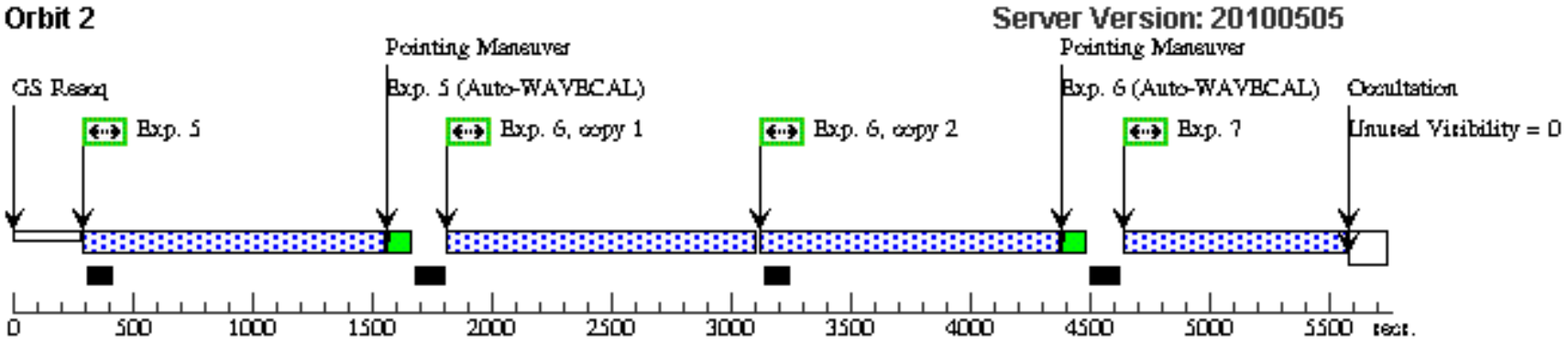
Comments: The ultra-violet fluxes listed are based upon archival IUE low resolution, large aperture data and (where available) STIS observations taken through the 0.2"x0.2" slit. The wavelengths listed are in the vicinity of key spectral features, and are representative of the fluxes measured in the wavelength interval covered by the three grating settings.

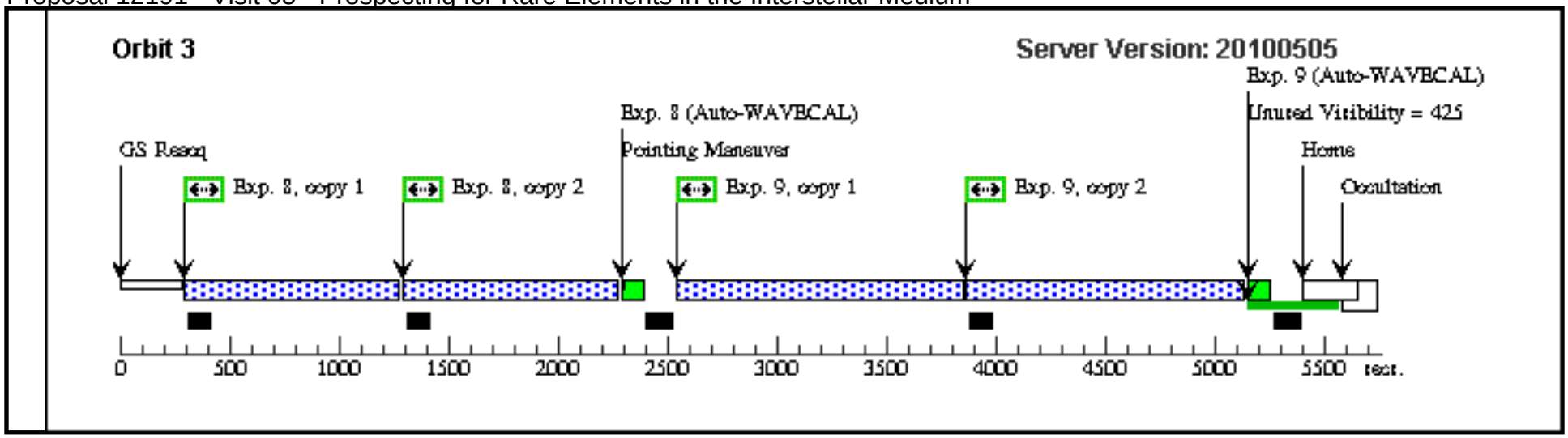
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	HD232522-ACQ	(2) HD232522	STIS/CCD, ACQ, F28X50OIII	MIRROR				1.7 Secs	
								[==>]	***[1]***
2	HD232522-ACQ/PEAK	(2) HD232522	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.7 Secs	
								[==>]	***[1]***
3		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPA	E140H 1416 A				1252.0 Secs X 2	
								[==>1238.0 Secs (Copy 1)] *[==>1238.0 Secs (Copy 2)]*	***[1]***
4		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPB	E140H 1416 A				1252.0 Secs	
								[==>1232.0 Secs]	***[1]***
5		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPB	E140H 1416 A				1242.0 Secs	
								[==>]	***[2]***
6		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPC	E140H 1416 A				1242.0 Secs X 2	
								[==>(Copy 1)] *[==>(Copy 2)]*	***[2]***
7		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPD	E140H 1416 A				874.0 Secs	
								[==>]	***[2]***
8		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPD	E140H 1416 A				986.0 Secs X 2	
								[==>972.0 Secs (Copy 1)] *[==>972.0 Secs (Copy 2)]*	***[3]***
9		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPE	E140H 1416 A				1270.0 Secs X 2	
								[==>1262.0 Secs (Copy 1)] *[==>1262.0 Secs (Copy 2)]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20100505
Exp. 9 (Auto-WAVECAL)
Unused Visibility = 425
Exp. 8 (Auto-WAVECAL)
Pointing Maneuver
GS Reacq
Home
Occultation
Exp. 8, copy 1
Exp. 8, copy 2
Exp. 9, copy 1
Exp. 9, copy 2
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.

Visit

Proposal 12191, Visit 06 Thu Jul 15 01:05:57 GMT 2010

Diagnostic Status: No Diagnostics

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

Special Requirements: VISIBILITY INTERVAL 93.0 M

Fixed Targets

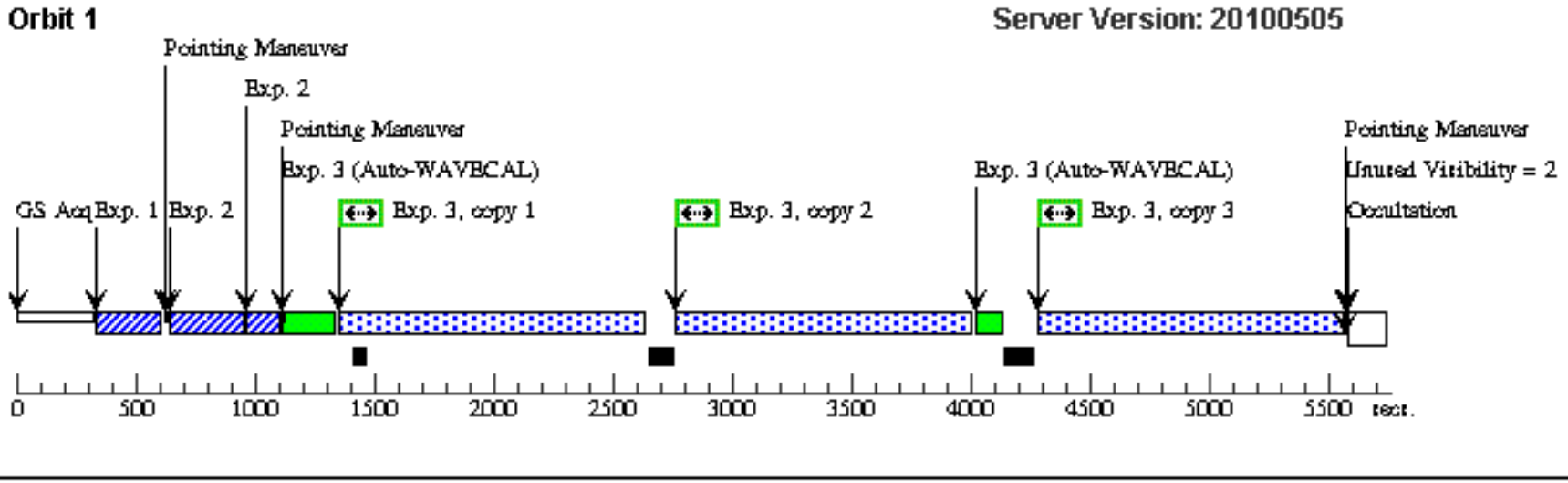
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HD232522	RA: 01 46 2.1900 (26.5091250d)	Proper Motion RA: 0.0s/yr	V=8.7	Reference Frame: ICRS
	Alt Name1: HIP8235	Dec: +55 19 54.90 (55.33192d)	Proper Motion Dec: -0.0018"/yr	E(B-V)=0.18,	
		Equinox: J2000	Epoch of Position: 1991.25	F(1321)=1.0e-11,	
				F(1433)=9.7e-12,	
				F(2145)=3.8e-12	

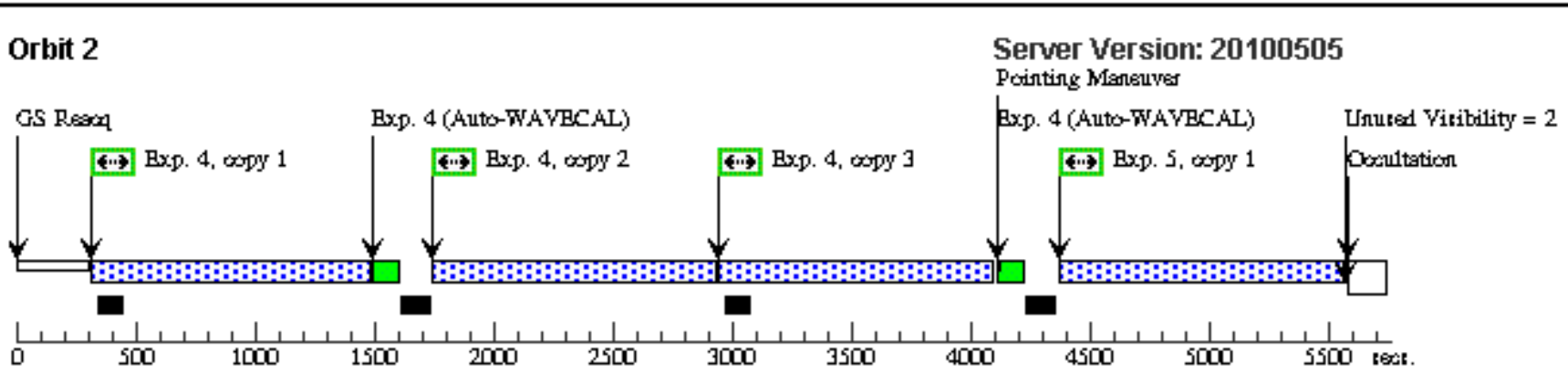
Comments: The ultra-violet fluxes listed are based upon archival IUE low resolution, large aperture data and (where available) STIS observations taken through the 0.2"x0.2" slit. The wavelengths listed are in the vicinity of key spectral features, and are representative of the fluxes measured in the wavelength interval covered by the three grating settings.

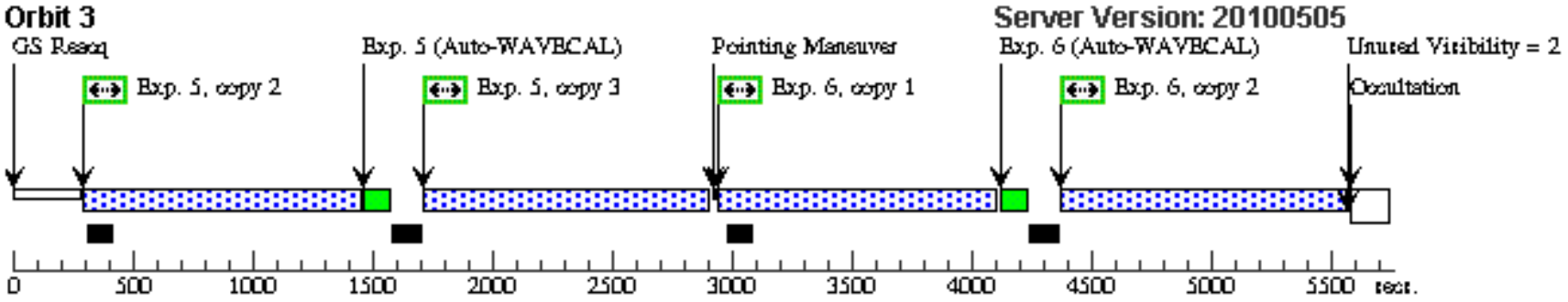
Exposures

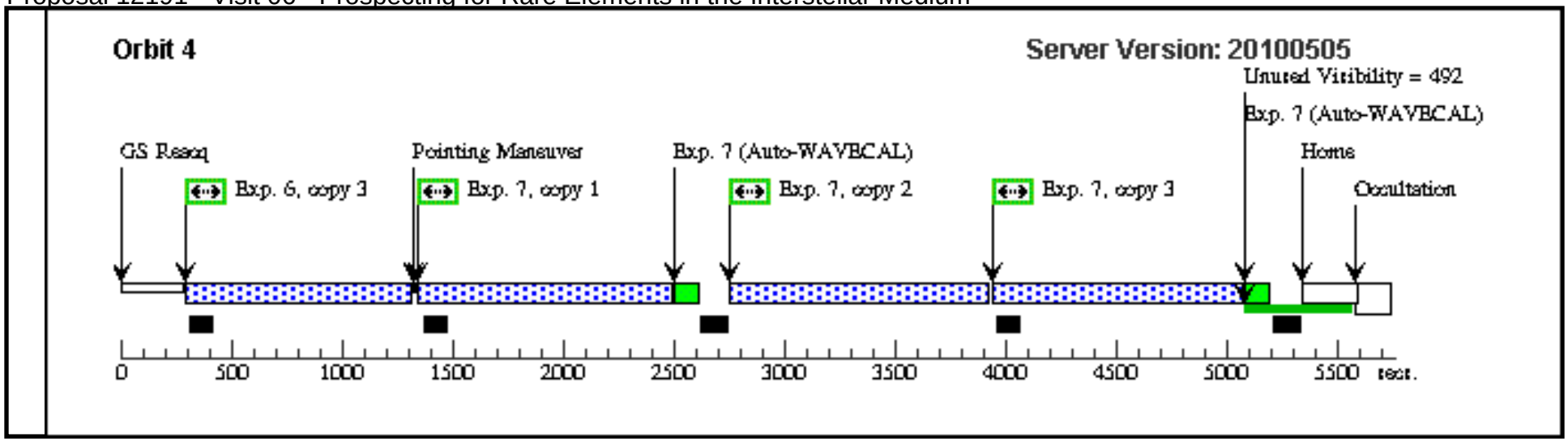
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	HD232522-ACQ	(2) HD232522	STIS/CCD, ACQ, F28X50OIII	MIRROR				1.7 Secs	
								[==>]	***[1]***
2	HD232522-ACQ/PEAK	(2) HD232522	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.7 Secs	
								[==>]	***[1]***
3		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPA	E140H 1234 A				1222.0 Secs X 3	
								[==>1232.0 Secs (Copy 1)]	***[1]***
								[==>1232.0 Secs (Copy 2)]	
								[==>1232.0 Secs (Copy 3)]	
4		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPB	E140H 1234 A				1137.0 Secs X 3	
								[==>1139.0 Secs (Copy 1)]	***[2]***
								[==>1139.0 Secs (Copy 2)]	
								[==>1139.0 Secs (Copy 3)]	
5		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPC	E140H 1234 A				1139.0 Secs X 3	
								[==>1141.0 Secs (Copy 1)]	***[2]***
								[==>1141.0 Secs (Copy 2)]	***[3]***
								[==>1141.0 Secs (Copy 3)]	
6		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPD	E140H 1234 A				1133.0 Secs X 3	
								[==>1135.0 Secs (Copy 1)]	***[3]***
								[==>1135.0 Secs (Copy 2)]	
								[==>1000.0 Secs (Copy 3)]	***[4]***
7		(2) HD232522	STIS/FUV-MAMA, ACCUM, 0.2X0.2FPE	E140H 1234 A				1095.0 Secs X 3	
								[==>1120.0 Secs (Copy 1)]	***[4]***
								[==>1120.0 Secs (Copy 2)]	
								[==>1120.0 Secs (Copy 3)]	

Orbit Structure








Orbit 4
Server Version: 20100505
Unused Visibility = 492
Exp. 7 (Auto-WAVECAL)
GS Reacq
Pointing Maneuver
Exp. 7 (Auto-WAVECAL)
Home
Occultation
Exp. 6, copy 3
Exp. 7, copy 1
Exp. 7, copy 2
Exp. 7, copy 3
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec.