12512 - Debris Disk Chemistry from Spatially Resolved Spectroscopy

Cycle: 19, Proposal Category: GO

(Availability Mode: AVAILABLE)

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) HR4796A CCDFLAT	STIS/CCD	2	01-Jul-2011 21:22:29.0	yes
02	(2) HR4748-CALIB CCDFLAT	STIS/CCD	1	01-Jul-2011 21:22:38.0	yes
03	(5) HD-32297 CCDFLAT	STIS/CCD	4	01-Jul-2011 21:22:50.0	yes
04	(6) HIP-22984-CALIB CCDFLAT	STIS/CCD	1	01-Jul-2011 21:22:59.0	yes
05	(9) AU-MIC CCDFLAT	STIS/CCD	3	01-Jul-2011 21:23:06.0	yes
06	(10) GJ-784-CALIB CCDFLAT	STIS/CCD	1	01-Jul-2011 21:23:13.0	yes

12 Total Orbits Used

ABSTRACT

We propose the first coronagraphic spectroscopy of three circumstellar debris disks. These observations will enable the only possible studies of their cold dust grain compositions. Spectroscopy of their dust will provide detailed reflectivities from 3500 - 9500 Angstroms, an unprecedentedly large wavelength grasp. We will be able to estimate the organic-to-silicate ratio of the dust and constrain its place of formation and subsequent processing. Debris dust arises from the collisions and evaporation of planetesimals, and it is these same planetesimals which are the building blocks for planets. The compositions and dynamics of planetesimals may reflect and affect the final composition and architectures of the planetary systems.

All of our targets have been imaged previously with HST. All have complex broad-band colors that change with location in the disk and that may signal the presence of dynamical perturbations or compositional processing. We have demonstrated in a previous program how to use STIS for spatially resolved disk spectroscopy. We now propose to apply our technique to study the compositions of essentially all known edge-on disks bright enough to observe with STIS.

OBSERVING DESCRIPTION

Each target consists of a sequence of observations:

1. Standard acquisition
2. Peakup - We do the peakup in the smallest available aperture.

Then, for both G430L and G750L gratings, we do the following:

3. Point source spectrum outside of fiducial in 52x0.2 slit
4. Fiducial spectra - maximum integration time for bright sources set by time to saturation of stellar scattered light at edge of the fiducial, minimum integration time for faint sources set by time to achieve source noise limited spectra. Integrations are CR-SPLIT for CR removal. In Phase I, we specifically requested the F2 fiducial (unsupported aperture) because of its superior light rejection. For the science objects, we specify a narrow range of acceptable ORIENTs to position the slit along the disk major axis.

For G750L only, we do a

5. Flat

CALIBRATION JUSTIFICATION

PSF observation - This is necessary to be able to subtract off the stellar contribution at every position and wavelength to reveal the spectrum and spatial profile of the disk.

Peakup - though not strictly required according to the STIS IHB, we want exceptionally good positioning under the fiducial in order to be able to cleanly subtract off the PSF contribution. For all targets (objects and PSFs), we do the peakup in the smallest available aperture.

Point source spectrum outside of fiducial in 52x0.2 slit - This is necessary for calibrating out any spectral differences between the target and PSFas well as for aiding in photometric calibration

G750L flat -CCDFLAT taken with 52X0.2 slit for better defringing of extended-source spectra (narrower slit would be better for defringing point-source spectra).

Visit

Proposal 12512, Visit 01, implementation Sat Jul 02 01:23:17 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 70.6D TO 71.6 D; GROUP 01,02 WITHIN 3.1 Orbits

Comments: Point-source and fiducial spectra of HR4796A with G705L and G430L. Need to align slit parallel to disk semi-major axis. Disk PA = 27.1 degrees. ORIENT = (27.1, 207.1) + offset angle = (27.1, 207.1) + 45 -1 = (71.1, 251.1) degrees. I would prefer exactly this angle, but at 1", I could tolerate an offset of 1/4 of a slit width, which corresponds to an angular offset of +/- 1.5 degrees. This offset angle (-1 deg) comes from Don Lindler (actually -0.957 deg). Charles Proffitt will get back to me on additional offset angle due to rotation of the slit. It turns out that the PA=71 is the schedulable orientation. Visits 01 and 02 should be scheduled as close together in time as possible.

Fixed Targets

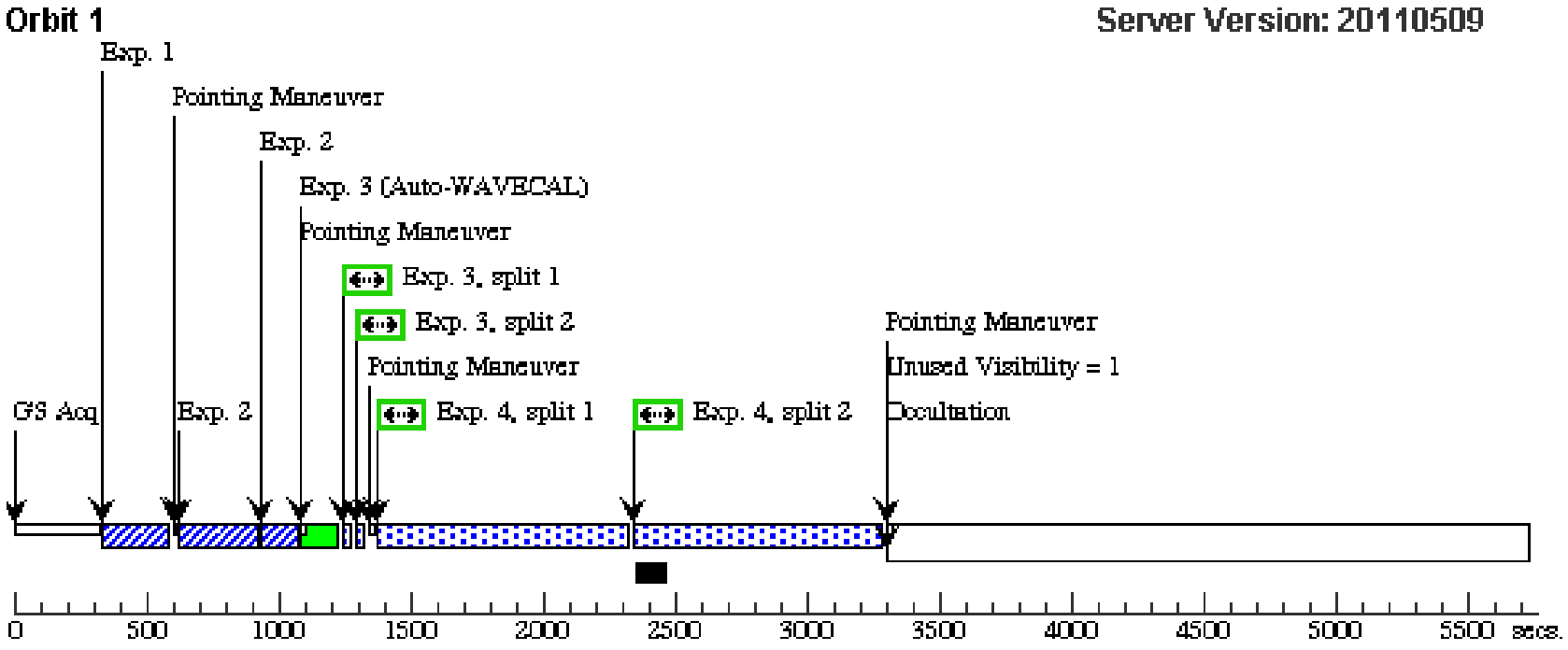
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	HR4796A	RA: 12 36 1.0700 (189.0044583d) Dec: -39 52 10.00 (-39.86944d) Equinox: J2000	Proper Motion RA: -56.66 mas/yr Proper Motion Dec: -24.99 mas/yr Parallax: 0.01374" Epoch of Position: 1991.25	V=5.8	Reference Frame: ICRS

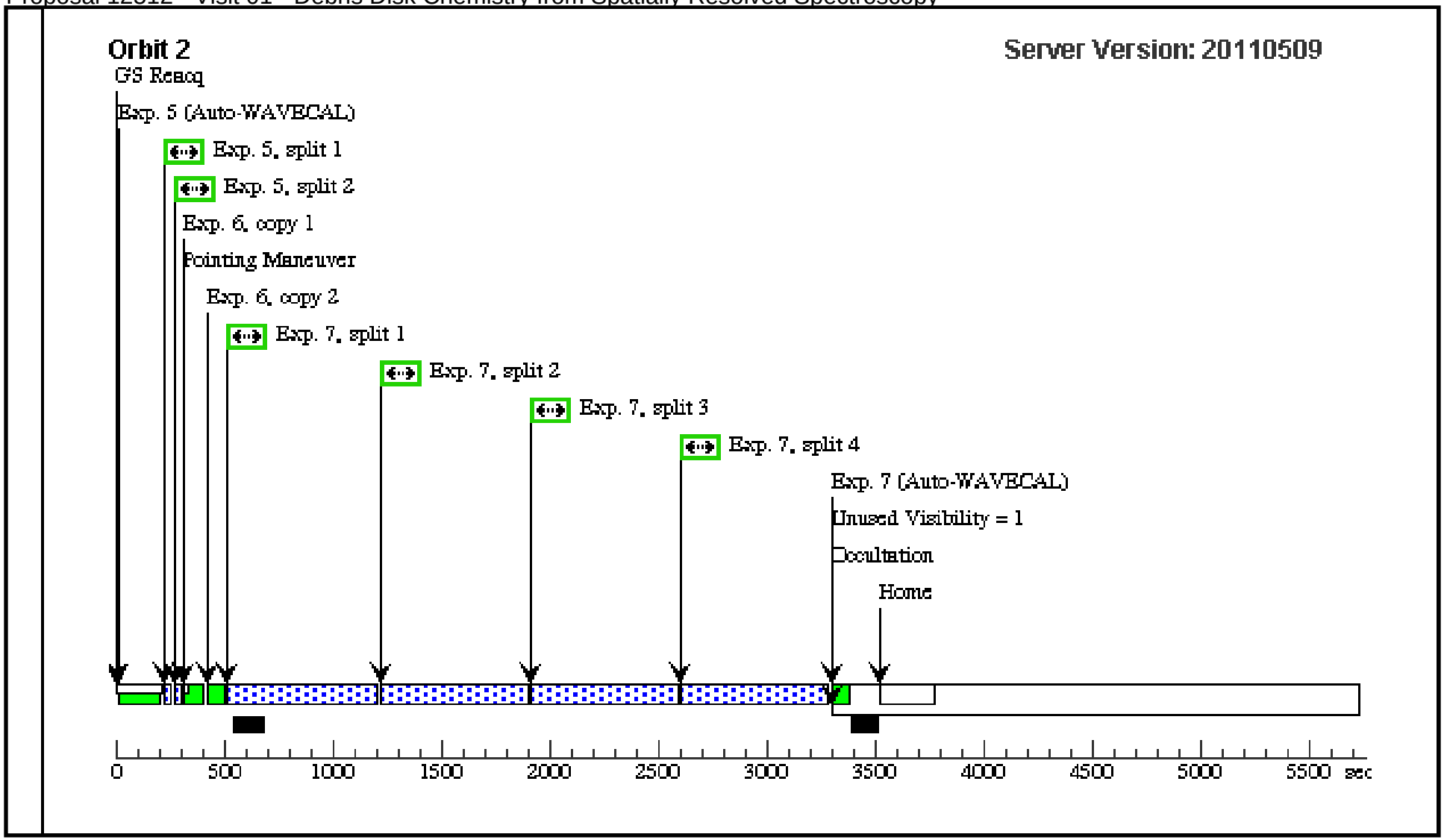
Comments: Hipparcos ICRS coordinates J1991.25

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.179232)	(1) HR4796A	STIS/CCD, ACQ, F28X50OII	MIRROR	ACQTYPE=POINT			0.1 Secs *[==>]*	***[1]***
	Comments: HR 4796 is A0V with B=5.79, V=5.78. F28X50OII filter gives S/N = 132 in 0.1s and doesn't saturate (with F28X50LP, brightest pixel saturates in minimum exposure time).								
2	Peakup	(1) HR4796A	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.1 Secs *[==>]*	***[1]***
	Comments: Peak-up in x and y required for accurate positioning of star under fiducial bar (short slit peak-up). T_exp = 0.1s with 0.2X0.05ND gives S/N = 159, with 14,363e- in brightest pixel (>5000e- desired accor ding to STIS IHB).								
3	Point_G430L (STIS.sp.181278)	(1) HR4796A	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A	GAIN=1; CR-SPLIT=2			0.4 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
	Comments:).4s gives S/N > 52 achieved at all wavelengths > 3100A.								
4	Fiducial_G430L (STIS.sp.181293)	(1) HR4796A	STIS/CCD, ACCUM, 52X0.2F2	G430L 4300 A	GAIN=1; CR-SPLIT=2			1816.0 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
	Comments: Brightest pixel (4000 Ang) in 891s = 891s x 17.6 counts/pix/s = 15682 = 48% full well at GAIN=1. *Maximum count rate estimated from 52X0.2F2 observation of HD141653 (A2V star, B=5.25, file o68m01050_crj.fits) and scaling to brightness of HR 4796A, B=5.79.*								
5	Point_G750L (STIS.sp.181274)	(1) HR4796A	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	GAIN=1; CR-SPLIT=2			0.4 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[2]***
	Comments: 0.4 s gives S/N > 52 for wave<9750A.								
6	Flat_G750L	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				*[==>(Copy 1)]* *[==>(Copy 2)]*	***[2]***
	Comments: CCDFLAT taken with 52X0.2 slit for better defringing of extended-source spectra (narrower slit would be better for defringing point-source spectra). Do 2 iterations for cosmic-ray rejection.								
7	Fiducial_G750L (STIS.sp.181294)	(1) HR4796A	STIS/CCD, ACCUM, 52X0.2F2	G750L 7751 A	GAIN=1; CR-SPLIT=4			2584.0 Secs *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]* *[==>(Split 4)]*	***[2]***
	Comments: Brightest pixel in 646s = 646s x 28.7 counts/pix/s = 18540 = 56% full well at GAIN=1. *Maximum count rate estimated from 52X0.2F2 observation of HD141653 (A2V star, V = 5.194, file o68m010b0_crj.fits) scaled to brightness of HR 4796A, V=5.78.*								

Orbit Structure




Orbit 2
Server Version: 20110509
GS Reacq
Exp. 5 (Auto-WAVECAL)
Exp. 5, split 1
Exp. 5, split 2
Exp. 6, copy 1
Pointing Maneuver
Exp. 6, copy 2
Exp. 7, split 1
Exp. 7, split 2
Exp. 7, split 3
Exp. 7, split 4
Exp. 7 (Auto-WAVECAL)
Unused Visibility = 1
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12512, Visit 02, implementation Sat Jul 02 01:23:19 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: (none)

Comments: Point-source and fiducial spectra of HR4748-PSF with G705L and G430L. No orientation constraint for observations. Visits 01 and 02 should be scheduled as close together as possible (GROUP WITHIN constraint given on visit 01).

Fixed Targets

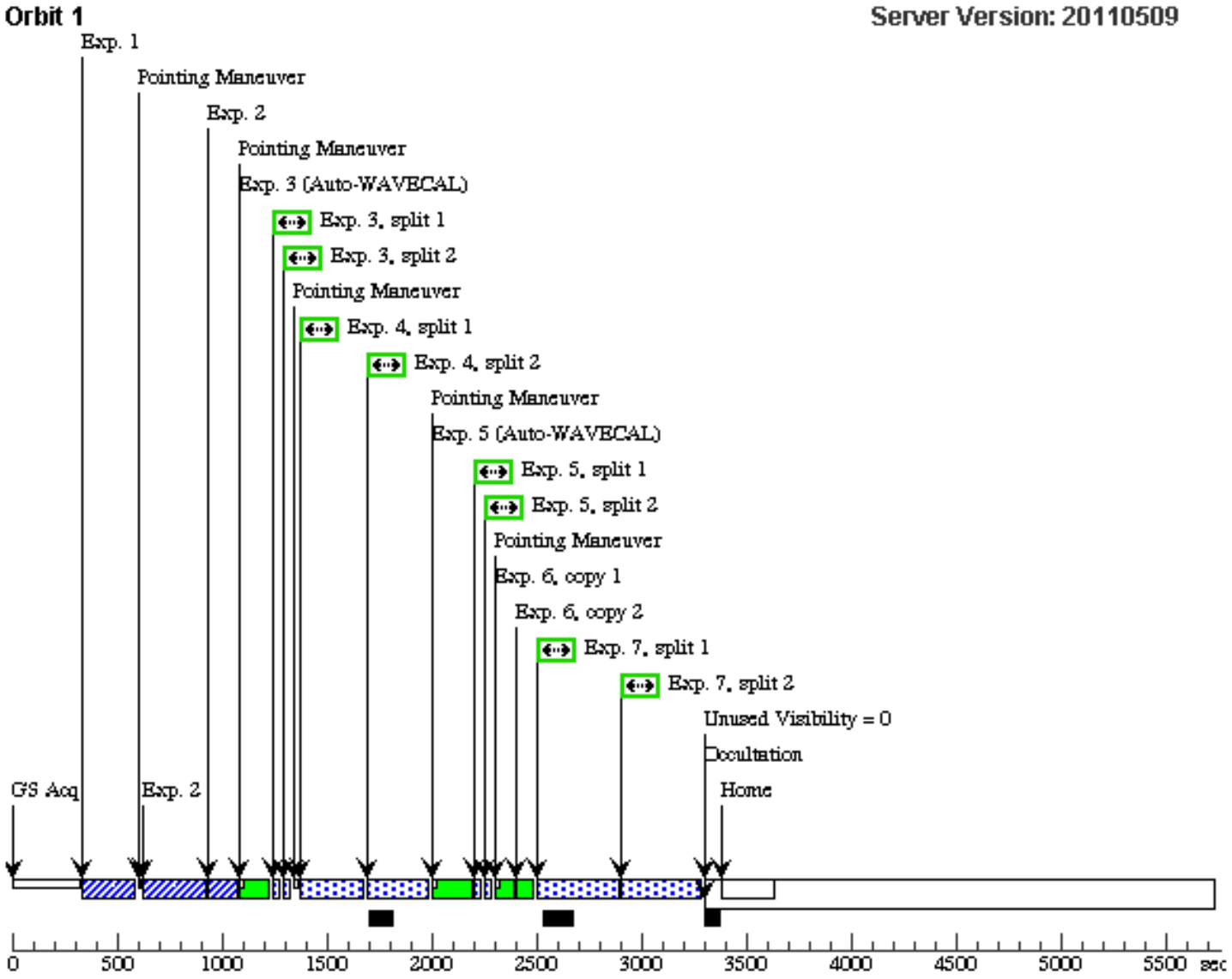
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	HR4748-CALIB	RA: 12 28 22.4900 (187.0937083d) Dec: -39 02 28.10 (-39.04114d) Equinox: J2000	Proper Motion RA: -28.69 mas/yr Proper Motion Dec: -14.0 mas/yr Parallax: 0.00764" Epoch of Position: 1991.25	V=5.5	Reference Frame: ICRS

Comments: Hipparcos ICRS coordinates epoch 1991.25

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACQ	(2) HR4748-CALIB	STIS/CCD, ACQ, F28X50OII	MIRROR	ACQTYPE=POINT			0.1 Secs *[==>]*	***[1]***
Comments: B=5.382, V=5.448, B8V; F28X50OII filter gives S/N = 190 in 0.1s and doesn't saturate (with F28X50LP, brightest pixel saturates in minimum exposure time).									
2	Peakup (STIS.ta.179511)	(2) HR4748-CALIB	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.1 Secs *[==>]*	***[1]***
Comments: Peak-up in x and y required for accurate positioning of star under fiducial bar (short slit peak-up). T_exp = 0.1s with 0.2X0.05ND gives S/N = 210 and does not saturate. 21,320e- in brightest pixel.									
3	Point_G430L (STIS.sp.181279)	(2) HR4748-CALIB	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A	GAIN=1; CR-SPLIT=2			0.2 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
Comments: S/N >75 achieved at all wavelengths > 3100A.									
4	Fiducial_G430L	(2) HR4748-CALIB	STIS/CCD, ACCUM, 52X0.2F2	G430L 4300 A	GAIN=1; CR-SPLIT=2			516.0 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
Comments: PSF star is 0.41 mag = 1.46 times brighter than HR4796 at B. *Brightest pixel in 250s image = 250s x 25.7 counts/pix/s = 6425 e- = 19% full well at GAIN=1. No problems there.* *Maximum count rate estimated from 52X0.2F2 observation of HD141653 (A2V star, B=5.25, file o68m01050_crj.fits) scaled to B=5.38*									
5	Point_G750L (STIS.sp.181277)	(2) HR4748-CALIB	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	GAIN=1; CR-SPLIT=2			0.4 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
Comments: 0.4 s gives S/N > 57 for wave<9750A.									
6	Flat_G750L	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				*[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
Comments: CCDFLAT taken with 52X0.2 slit for better defringing of extended-source spectra (narrower slit would be better for defringing point-source spectra). Do 2 iterations for cosmic-ray rejection.									
7	Fiducial_G750L	(2) HR4748-CALIB	STIS/CCD, ACCUM, 52X0.2F2	G750L 7751 A	GAIN=1; CR-SPLIT=2			698.0 Secs *[==>342.0 Secs (Split 1)]* *[==>342.0 Secs (Split 2)]*	***[1]***
Comments: PSF star is 0.33 mag = 1.355 times brighter than HR4796. *Brightest pixel in 350s image = 350s x 38.9 counts/pix/s = 13615 = 41% full well at GAIN=1. No problem there.* *Maximum count rate estimated from 52X0.2F2 observation of HD141653 (A0V star, V = 5.194, file o68m010b0_crj.fits) scaled to HR 4748 V=5.45.*									

Orbit Structure



Visit

Proposal 12512, Visit 03, implementation Sat Jul 02 01:23:19 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: ORIENT 91D TO 92 D; ORIENT 271D TO 272 D; GROUP 03,04 WITHIN 5.1 Orbits

Comments: Point-source and fiducial spectra of HD 32297 with G705L and G430L. Need to align slit parallel to disk semi-major axis. Disk PA = 47.5/227.5 degrees (median of both lobes). ORIENT = (47.5, 227.5) + offset angle = (47.5, 227.5) + 45 -1 = (91.5, 271.5) degrees +/- 1.0 degrees. Charles Proffitt will get back to me on additional offset angle due to rotation of the slit, but -1 deg comes from Don Lindler. Visits 03 and 04 should be scheduled as close together in time as possible.

Fixed Targets

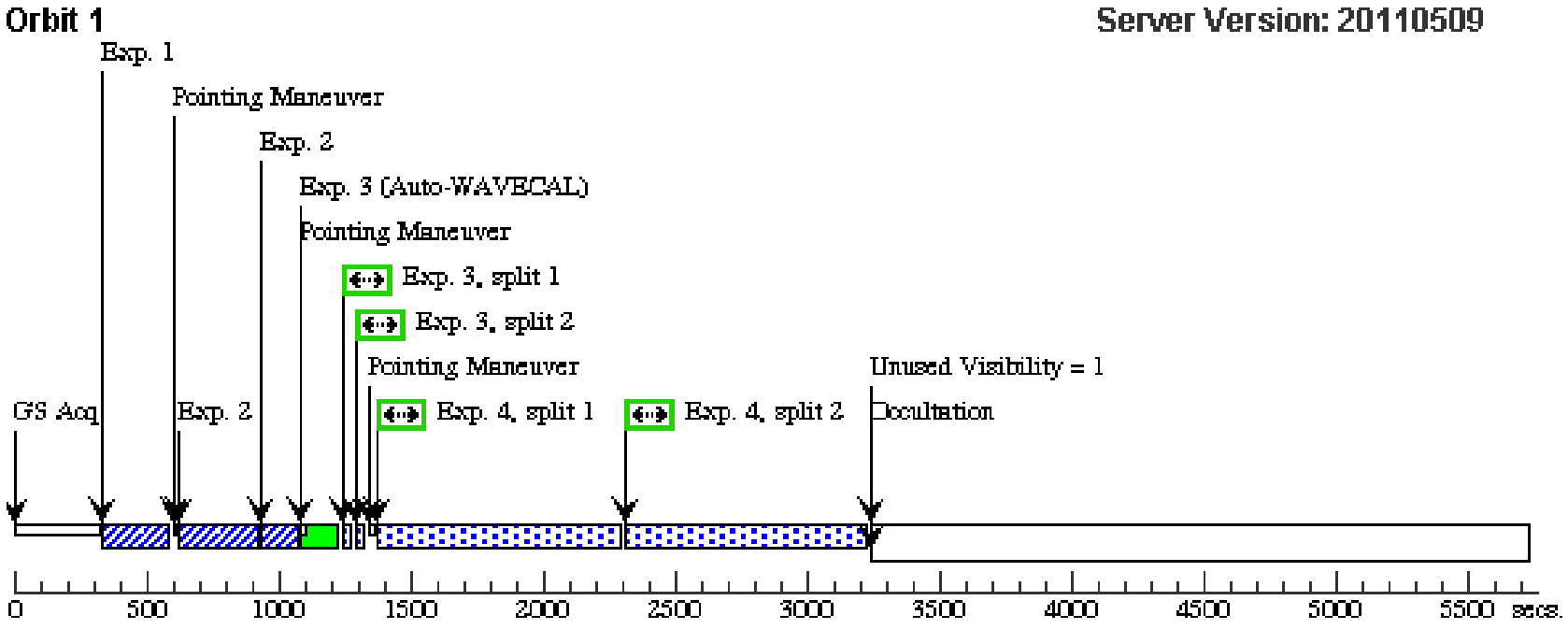
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	HD-32297	RA: 05 02 27.4370 (75.6143208d) Dec: +07 27 39.68 (7.46102d) Equinox: J2000	Proper Motion RA: 6.67 mas/yr Proper Motion Dec: -23.32 mas/yr Parallax: 0.00892" Epoch of Position: 2000	V=8.13	Reference Frame: ICRS

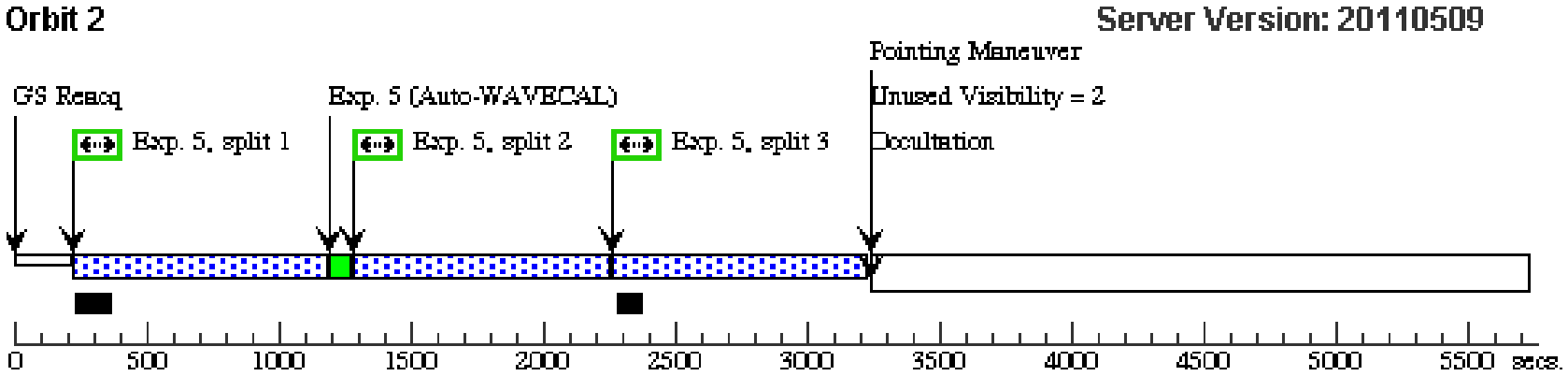
Comments: A0V star; B-V=0.2; Hipparcos ICRS coordinates epoch J2000 (via VizieR)

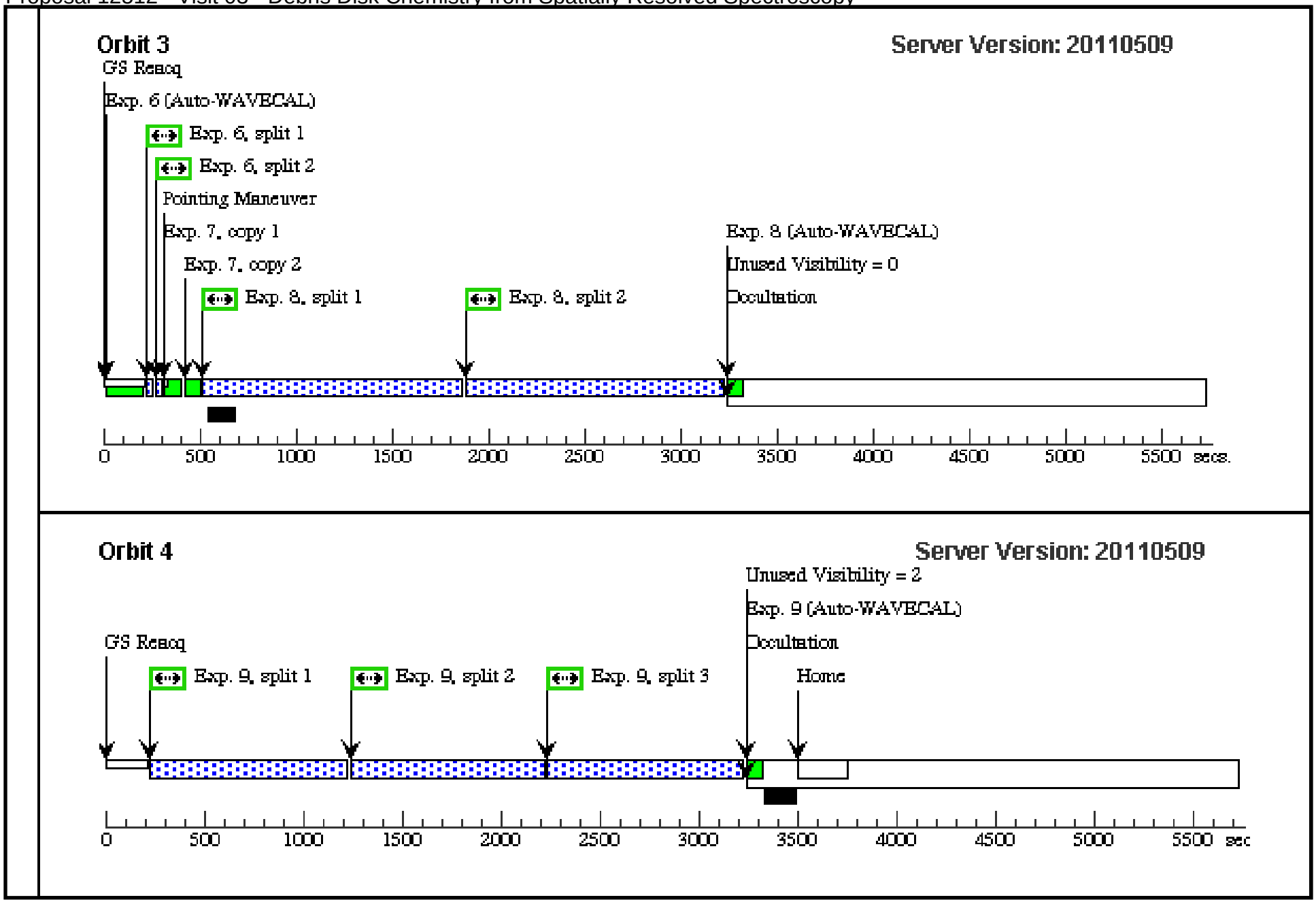
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.179214)	(5) HD-32297	STIS/CCD, ACQ, F28X50OII	MIRROR	ACQTYPE=POINT			0.3 Secs *[==>]*	***[1]***
Comments: F28X50OII filter (3729A) gives S/N = 75 in 0.3s and doesn't saturate (with F28X50LP, 70% full well in minimum exposure time; too close to saturation for comfort). *B=8.33* *V=8.13*									
2	Peakup (STIS.ta.179965)	(5) HD-32297	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.3 Secs *[==>]*	***[1]***
Comments: Peak-up in x and y required for accurate positioning of star under fiducial bar (short slit peak-up). IHB says we need at least 5000e- (1250 DN). T_exp = 0.3s with 0.2X0.05ND gives S/N = 60 with 4453e- in brightest pixel and 17390e- in 32x32 box.									
3	Point_G430L (STIS.sp.179225)	(5) HD-32297	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A	GAIN=1; CR-SPLIT=2			1.0 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
Comments: Tint=1 s gives S/N > 30 at wavelengths > 3100A; SN>80 for wavelengths>3600.									
4	Fiducial_G430L	(5) HD-32297	STIS/CCD, ACCUM, 52X0.2F2	G430L 4300 A	GAIN=1; CR-SPLIT=2			1740.0 Secs *[==>878.0 Secs (Split 1)]* *[==>878.0 Secs (Split 2)]*	***[1]***
Comments: Brightest pixel in expects 1.7 e-/s at about 4000 Ang. Should be no problem with saturation at edge of fiducial. *Maximum count rate estimated from 52X0.2F2 observation of HD141653 (A0V star, B=5.25, file o68m01050_crj.fits) scaled to HD 32297 at B=8.33.*									
5	Fiducial_G430L	(5) HD-32297	STIS/CCD, ACCUM, 52X0.2F2	G430L 4300 A	GAIN=1; CR-SPLIT=3			2763.0 Secs *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[2]***
6	Point_G750L (STIS.sp.179231)	(5) HD-32297	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	GAIN=1; CR-SPLIT=2			2.0 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[3]***
Comments: 2 s gives S/N>36 at wavelengths<9750A									
7	Flat_G750L	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				*[==>(Copy 1)]* *[==>(Copy 2)]*	***[3]***
Comments: CCDFLAT taken with 52X0.2 slit for better defringing of extended-source spectra (narrower slit would be better for defringing point-source spectra). Do 2 iterations for cosmic-ray rejection.									
8	Fiducial_G750L	(5) HD-32297	STIS/CCD, ACCUM, 52X0.2F2	G750L 7751 A	GAIN=1; CR-SPLIT=2			2614 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[3]***
Comments: Brightest pixel will have 3.3e-/s, so can go as long as 10,000 s without saturating. Just fill orbits. *Maximum count rate estimated from 52X0.2F2 observation of HD141653 (A0V star, V = 5.194, file o68m010b0_crj.fits) scaled to V=8.13 of HD 32297.*									
9	Fiducial_G750L	(5) HD-32297	STIS/CCD, ACCUM, 52X0.2F2	G750L 7751 A	GAIN=1; CR-SPLIT=3			2862.0 Secs *[==>(Split 1)]* *[==>(Split 2)]* *[==>(Split 3)]*	***[4]***

Orbit Structure



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GS Reacq
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Exp. 6, split 2
Pointing Maneuver
Exp. 7, copy 1
Exp. 7, copy 2
Exp. 8, split 1
Exp. 8, split 2
Exp. 8 (Auto-WAVECAL)
Unused Visibility = 0
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
secs.
Orbit 4
Server Version: 20110509
Unused Visibility = 2
Exp. 9 (Auto-WAVECAL)
Occultation
GS Reacq
Exp. 9, split 1
Exp. 9, split 2
Exp. 9, split 3
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12512, Visit 04, implementation Sat Jul 02 01:23:20 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: (none)

Comments: Point-source and fiducial spectra of HIP22984-CALIB for HD 32297 with G705L and G430L. No orientation constraint for observations. Visits 03 and 04 should be scheduled as close together as possible (GROUP WITHIN constraint given on visit 03).

Fixed Targets

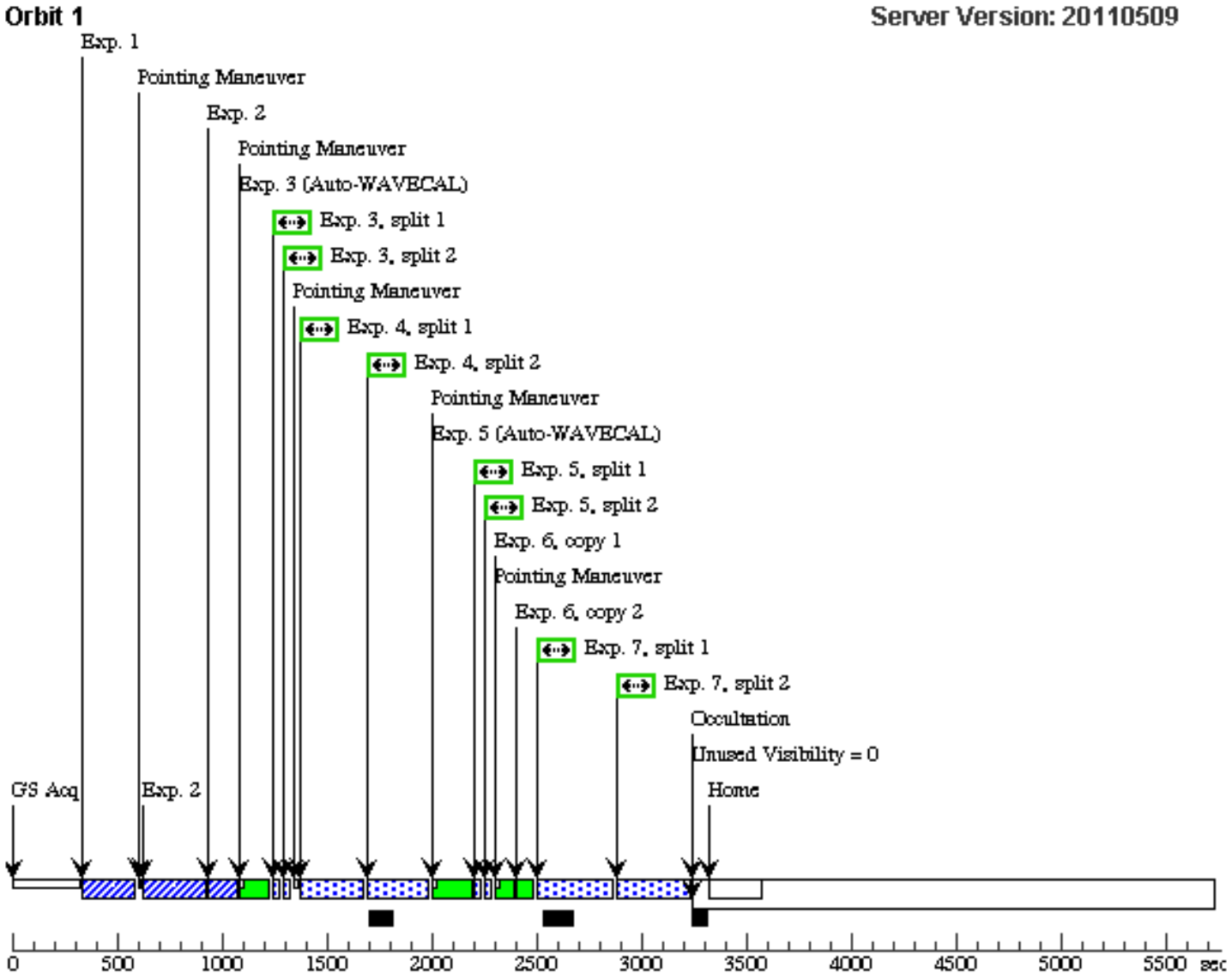
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(6)	HIP-22984-CALIB	RA: 04 56 43.7900 (74.1824583d)	Proper Motion RA: 19.75 mas/yr	V=7.49	Reference Frame: ICRS
	Alt Name1: HD31489	Dec: +08 49 20.70 (8.82242d)	Proper Motion Dec: 0.25 mas/yr		
		Equinox: J2000	Parallax: 0.00634"		
			Epoch of Position: 1991.25		

Comments: B-V=0.2. Hipparcos ICRS coordinates epoch J1991.25

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACQ (STIS.sp.18 1280)	(6) HIP-22984-CALI B	STIS/CCD, ACQ, F28X50OII	MIRROR	ACQTYPE=POINT			0.2 Secs *[==>]*	***[1]***
	Comments: B=7.68, V=7.49, B8V; 0.2 s in F28X50OII filter gives S/N = 73 (too bright for F28X50LP)								
2	Peakup (STIS.ta.181 283)	(6) HIP-22984-CALI B	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.2 Secs *[==>]*	***[1]***
	Comments: Peak-up in x and y required for accurate positioning of star under fiducial bar (short slit peak-up). T_exp = 0.2s with 0.2X0.05ND gives S/N = 75 and 5709e- in brightest pixel.								
3	Point_G430 L (STIS.sp.18 1281)	(6) HIP-22984-CALI B	STIS/CCD, ACCUM, 52X0.2E1	G430L 4300 A	GAIN=1; CR-SPLIT=2			1.0 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
	Comments: S/N > 35 achieved at all wavelengths > 3100A.								
4	Fiducial_G4 30L (STIS.sp.18 1335)	(6) HIP-22984-CALI B	STIS/CCD, ACCUM, 52X0.2F2	G430L 4300 A	GAIN=1; CR-SPLIT=2			516 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
	Comments: PSF star is 0.64 mag brighter (1.8x brighter) than HD 32297. *Brightest pixel at edge of fiducial should have 2.8 e-/s. Not a problem for exposures < 10Ks.* *Maximum count rate estimated from 52X0.2F2 observation of HD141653 (A0V star, B=5.25, file o68m01050_crj.fits) and scaled to HIP 22984 with B=7.69*								
5	Point_G750 L (STIS.sp.17 9527)	(6) HIP-22984-CALI B	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	GAIN=1; CR-SPLIT=2			1.8 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
	Comments: 1.8 s gives S/N > 50 for wave<9750A.								
6	Flat_G750L	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				*[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
	Comments: CCDFLAT taken with 52X0.2 slit for better defringing of extended-source spectra (narrower slit would be better for defringing point-source spectra). Do 2 iterations for cosmic-ray rejection.								
7	Fiducial_G7 50L (STIS.sp.18 1336)	(6) HIP-22984-CALI B	STIS/CCD, ACCUM, 52X0.2F2	G750L 7751 A	GAIN=1; CR-SPLIT=2			624 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
	Comments: PSF star is 0.64 mag brighter (1.8x brighter) than HD 32297. *Brightest pixel at edge of fiducial should have 5.9 e-/s. Not a problem for exposures < 5Ks.* *Maximum count rate estimated from 52X0.2F2 observation of HD141653 (A0V star, V =5.19, file o68m01050_crj.fits) and scaled to HIP 22984 with V=7.49*								

Orbit Structure



Visit

Proposal 12512, Visit 05, implementation Sat Jul 02 01:23:20 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: PCS MODE FINE; ORIENT 352D TO 353.6 D; GROUP 05,06 WITHIN 4.1 Orbits

Comments: Point-source and fiducial spectra of AU Mic with G705L. Need to align slit parallel to disk semi-major axis. Disk PA = 128.6 degrees (Krist et al. 2005). ORIENT = (128.6, 308.6) + offset angle = (128.6, 308.6) + 45 -1 = (172.6, 352.6) degrees. Charles Proffitt will get back to me on additional offset angle due to rotation of the slit (see p. 269; 282 of PDF of IHB), but this one comes from Don Lindler and should be ok. Visits 05 and 06 should be scheduled as close together in time as possible.

The AU Mic midplane is narrow; at 1.9" from the star, the FWHM of the midplane is 0.24" (from Figure 6 of Krist et al. 2005). The maximum angle that can be tolerated at 2" is 1/2 slit width, or 0.1". This implies an angle asin(0.1)/2 = 2.9 deg. So, I could do 352.6+2.9 = 355.5 deg at absolute worst. At 3" from the star, the angle is asin(0.1)/3 = 1.9 deg. For now, specify MaxOrient of orient+1 deg (i.e. 353.6) but could relax a little later if necessary for schedulability. MinOrient is not constraining the schedulability, so leave it.

To get desired ORIENT to schedule, I had to shorten my orbits by 1-2 min.

Fixed Targets

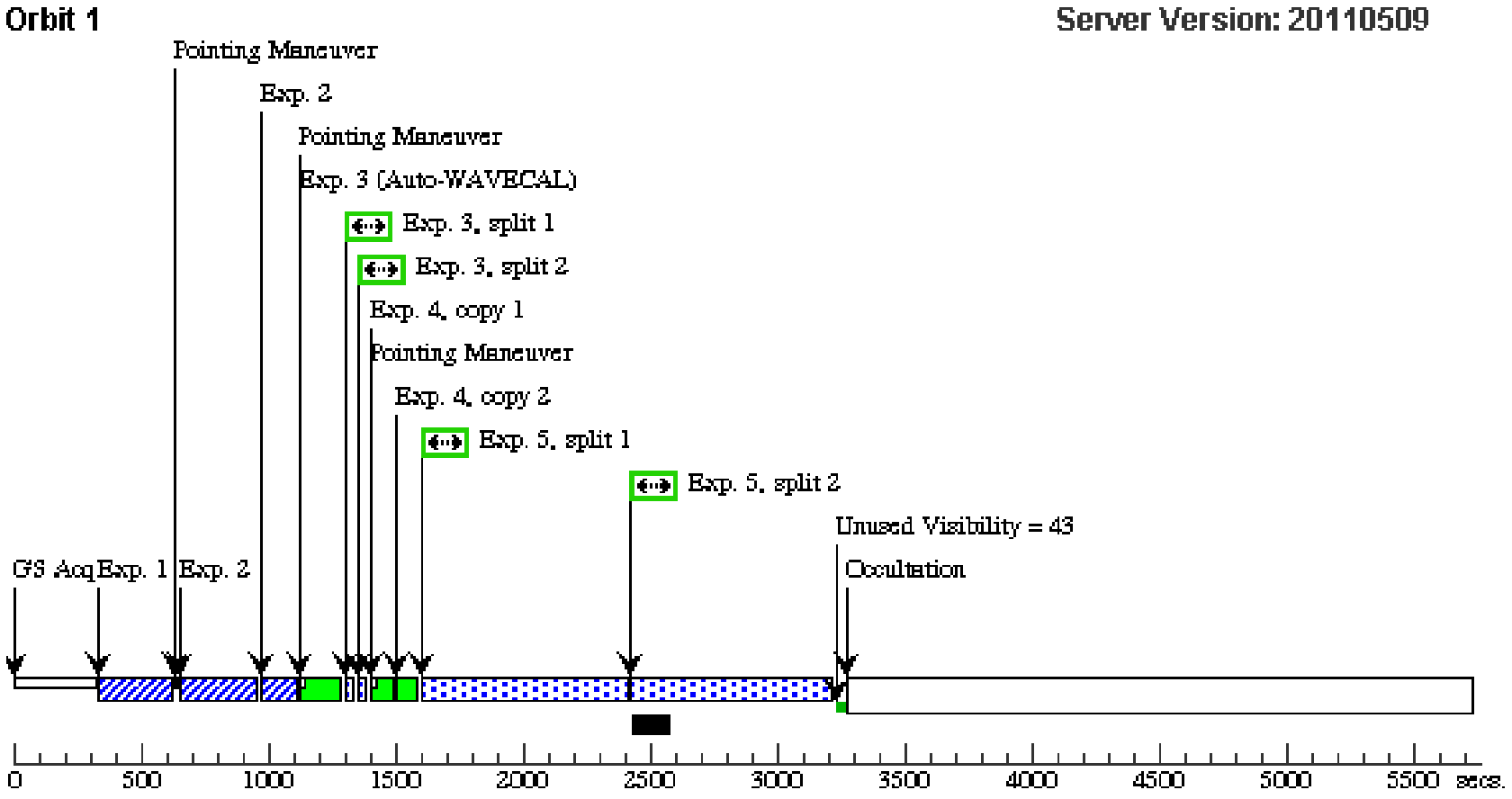
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(9)	AU-MIC	RA: 20 45 9.5318 (311.2897158d)	Proper Motion RA: 280.37 mas/yr	V=8.61	Reference Frame: ICRS
		Dec: -31 20 27.24 (-31.34090d)	Proper Motion Dec: -360.09 mas/yr		
		Equinox: J2000	Parallax: 0.10059"		
			Epoch of Position: 2000		

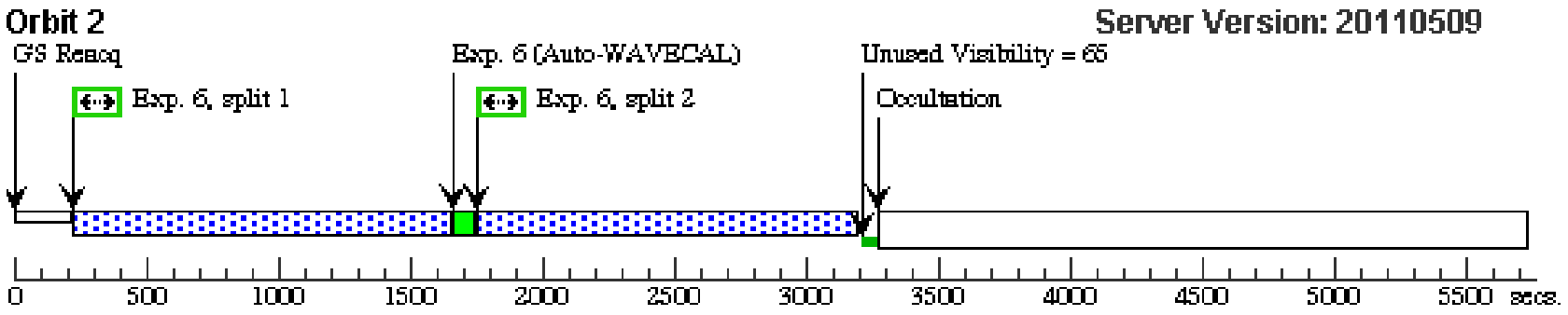
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Hipparcos PMs and Plx

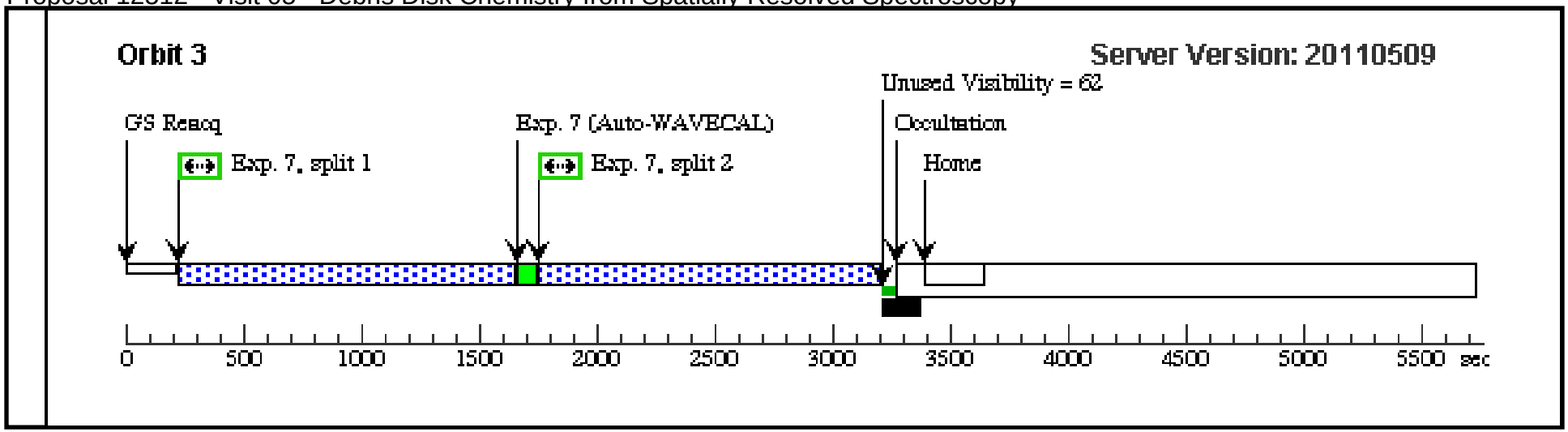
Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.182067)	(9) AU-MIC	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.3 Secs *[==>]*	***[1]***
	Comments: B=10.05, V=8.61; Saturates in minimum exposure time in F28x50LP; *F28X50OII(filter gives S/N = 75 in 0.31s and doesn't saturate but might have flare emission (STIS.ta.179214)* *Went with F25ND3; used successfully in program 12228* *F25ND3 gives S/N=82 (2413 e- in brightest pixel) in 0.3 s*								
2	Peakup (STIS.ta.180458)	(9) AU-MIC	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.4 Secs *[==>]*	***[1]***
	Comments: Peak-up in x and y required for accurate positioning of star under fiducial bar (short slit peak-up). IHB says we need at least 5000e- (1250 DN). T_exp = 0.4s with 0.2X0.05ND gives S/N = 80 with 5188e- in brightest pixel and 23,785e- in 32x32 box.								
3	Point_G750L (STIS.sp.181284)	(9) AU-MIC	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	GAIN=1; CR-SPLIT=2			0.6 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
	Comments: 0.5 s gives S/N>58 at all wavelengths								
4	Flat_G750L	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				*[==>(Copy 1)]* *[==>(Copy 2)]*	***[1]***
	Comments: CCDFLAT taken with 52X0.2 slit for better defringing of extended-source spectra (narrower slit would be better for defringing point-source spectra). Do 2 iterations for cosmic-ray rejection.								
5	Fiducial_G750L (STIS.sp.180489)	(9) AU-MIC	STIS/CCD, ACCUM, 52X0.2F2	G750L 7751 A	GAIN=1; CR-SPLIT=2			1520 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[1]***
	Comments: Brightest pixel at edge of wedge from star will have 5.4e-/s, so can go as long as 6,000 s per exposure without saturating. *Maximum count rate estimated from 52X0.2F2 observation of CD-43 2742 (M20V star, V = 10.15) scaled to V=8.61 of AU Mic.* *Make sure we're source noise dominated - for total expected disk+star surface brightness at 1" of 3.5e-15 erg/s/cm^2/Ang/sq.arcsec, ETC says we get source noise=readout noise (15.8e-) for 330 s (See ETC STIS.sp.180489). For AU Mic disk alone, SB=1.2e-15. To get this to be source noise limited takes ~1000s. At R=2", disk is 2x fainter. To get this to be source noise limited takes 1883 s. But, we need CR-SPLITs, so we'll do CR-SPLIT=2. In the firsts orbit, we only get ~790s/exposure. In subsequent orbits, we get 1400 s/exposure.* *Note: I had to reduce the exposure time to 1500 s (which looks like it doesn't fill the orbit) in order to get my ORIENT schedulable -- i.e. move to a shorter orbit more off nominal.*								
6	Fiducial_G750L	(9) AU-MIC	STIS/CCD, ACCUM, 52X0.2F2	G750L 7751 A	GAIN=1; CR-SPLIT=2			2780 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[2]***
7	Fiducial_G750L	(9) AU-MIC	STIS/CCD, ACCUM, 52X0.2F2	G750L 7751 A	GAIN=1; CR-SPLIT=2			2780 Secs *[==>(Split 1)]* *[==>(Split 2)]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20110509
Unused Visibility = 62
GS Reacq
Exp. 7, split 1
Exp. 7 (Auto-WAVECAL)
Exp. 7, split 2
Occultation
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec

Visit

Proposal 12512, Visit 06, implementation Sat Jul 02 01:23:21 GMT 2011

Diagnostic Status: No Diagnostics

Scientific Instruments: STIS/CCD

Special Requirements: (none)

Comments: Point-source and fiducial spectra of GJ 784 with G705L. Visits 05 and 06 should be scheduled as close together in time as possible. This constraint is placed on Visit 5

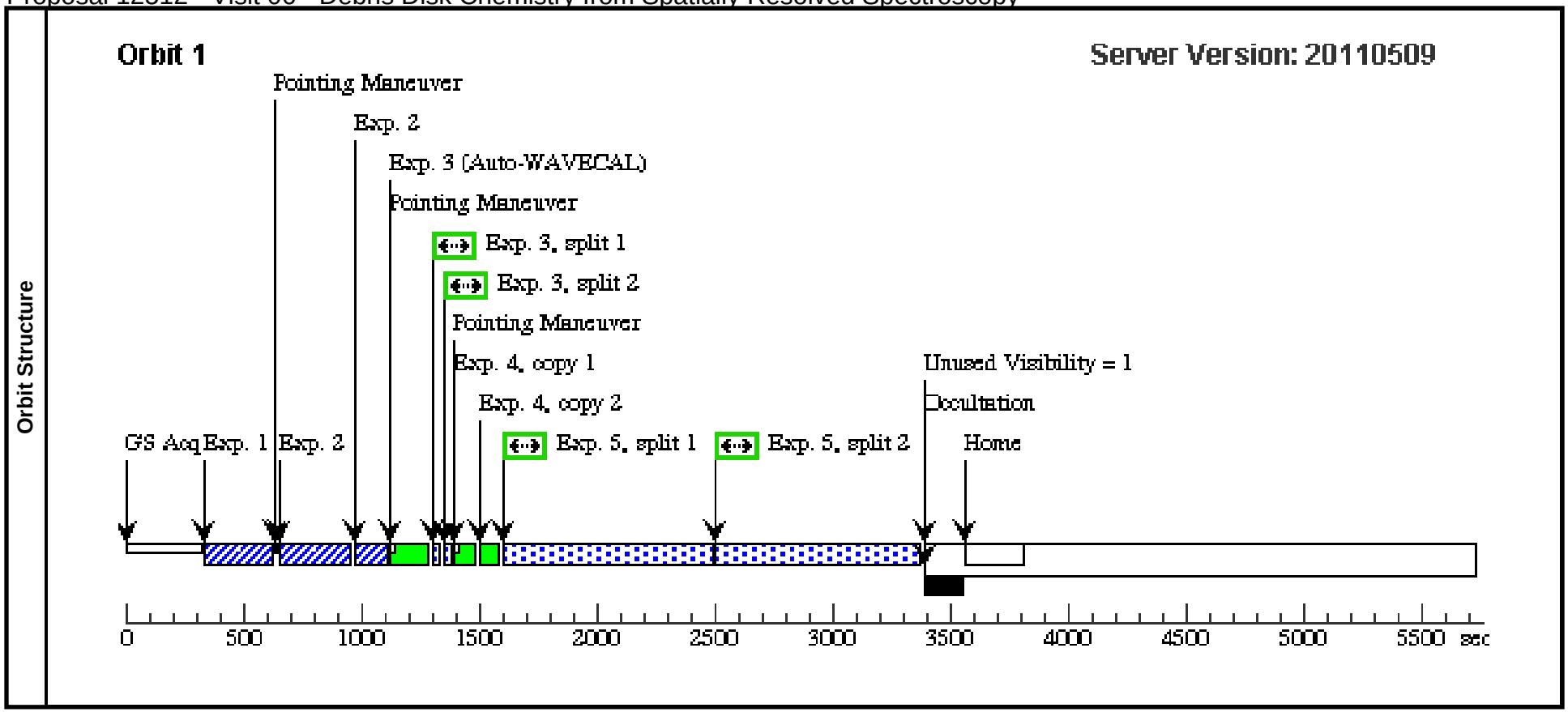
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(10)	GJ-784-CALIB	RA: 20 13 53.3963 (303.4724846d) Dec: -45 09 50.47 (-45.16402d) Equinox: J2000	Proper Motion RA: 778.18 mas/yr Proper Motion Dec: -159.55 mas/yr Parallax: 0.16117" Epoch of Position: 2000	V=7.97	Reference Frame: ICRS

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

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACQ (STIS.ta.182074)	(10) GJ-784-CALIB	STIS/CCD, ACQ, F25ND3	MIRROR	ACQTYPE=POINT			0.2 Secs *[==>]*	*[1]*
	Comments: B=9.42, V=7.97; Saturates in minimum exposure time in F28x50LP; use same Acq filter as for AU Mic - F25ND3 gives S/N=81 in 0.2 s								
2	Peakup (STIS.ta.180464)	(10) GJ-784-CALIB	STIS/CCD, ACQ/PEAK, 0.2X0.05ND	MIRROR				0.3 Secs *[==>]*	*[1]*
	Comments: Peak-up in x and y required for accurate positioning of star under fiducial bar (short slit peak-up). IHB says we need at least 5000e- (1250 DN). T_exp = 0.2s with 0.2X0.05ND gives S/N = 65 with 4237e- in brightest pixel and 19039e- in 32x32 box.								
3	Point_G750L (STIS.sp.181287)	(10) GJ-784-CALIB	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	GAIN=1; CR-SPLIT=2			0.4 Secs *[==>(Split 1)]* *[==>(Split 2)]*	*[1]*
	Comments: 0.4 s gives S/N>60 at all wavelengths								
4	Flat_G750L	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				*[==>(Copy 1)]* *[==>(Copy 2)]*	*[1]*
	Comments: CCDFLAT taken with 52X0.2 slit for better defringing of extended-source spectra (narrower slit would be better for defringing point-source spectra). Do 2 iterations for cosmic-ray rejection.								
5	Fiducial_G750L	(10) GJ-784-CALIB	STIS/CCD, ACCUM, 52X0.2F2	G750L 7751 A	GAIN=1; CR-SPLIT=2			1678 Secs *[==>(Split 1)]* *[==>(Split 2)]*	*[1]*
	Comments: Brightest pixel will have 9.7e-/s, so can go as long as 3000 s per exposure without saturating. *Maximum count rate estimated from 52X0.2F2 observation of CD-43 2742 (M20V star, V = 10.15) scaled to V=7.97 of AU Mic.*								


Orbit Structure
Orbit 1
Server Version: 20110509
Pointing Maneuver
Exp. 2
Exp. 3 (Auto-WAVECAL)
Pointing Maneuver
Exp. 3, split 1
Exp. 3, split 2
Pointing Maneuver
Exp. 4, copy 1
Exp. 4, copy 2
Unused Visibility = 1
Occultation
GS Acq
Exp. 1
Exp. 2
Exp. 5, split 1
Exp. 5, split 2
Home
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec