



12522 - Testing feedback with $z=1$ star-forming galaxies

Cycle: 19, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) 2QZJ0302-3216	COS/NUV	1	19-Jun-2012 22:21:23.0	yes
02	(2) SDSSJ1422-0001	COS/NUV	4	19-Jun-2012 22:21:33.0	yes
03	(3) SDSSJ0147+1258	STIS/CCD STIS/NUV-MAMA	5	19-Jun-2012 22:21:53.0	yes

10 Total Orbits Used

ABSTRACT

Theoretical models of galaxy formation predict that feedback from supernovae plays a crucial role in regulating star formation in low-mass galaxies. Efficient feedback, with large outflow rates, is needed in these models to account for the low-efficiency of galaxy formation in low-mass halos. Current constraints on mass outflow rates in this low mass regime are very sparse and the best estimates are uncertain by orders of magnitude. In

order to test feedback models, we selected a unique sample of $z=1$ star-forming galaxies, near background quasars, that show direct evidence of strong outflows: they show large velocities (200-500 km/s) from the low-ionization absorption lines. The advantage in using background quasars over traditional galaxy spectra is that the kinematics and location of the cool gas can be determined accurately. The one missing ingredient in order to determine accurate mass outflow rates is the total gas column density. Therefore, we propose to measure the total gas column density and empirically determine the outflow rates in low-mass (sub- L^*) star-forming galaxies using COS/G230L given the redshift of our sources. With these data we will answer the fundamental question: Are the mass outflow rates higher than the star-formation rates as predicted by theory? Our sample is unique: for each quasar-galaxy pair, we have deep IFU kinematics of the galaxy and the line-of-sight kinematics with high-resolution optical spectroscopy. Our results will be a huge step forward and provide a strong bench mark for models.

OBSERVING DESCRIPTION

In order to determine accurate mass outflow rates in star-forming galaxies, we need to measure the total gas column density for the outflowing gas probed by the background quasars. Given the redshift of our sources, we must use NUV spectroscopy with COS/G230L. The low resolution grating is sufficient as we expect absorptions of a few AA, i.e. not mAA. Our pilot study is made of the best 3 sources from our sample. Hence, the scope of this project is very focused.

For J0302, we aim to detect and measure the HI absorption line at 2215AA.

For J1422, we aim to detect and measure the HI absorption line at 2331AA.

For J0147, we aim to detect and measure the HI absorption line at 2480AA.

REAL TIME JUSTIFICATION

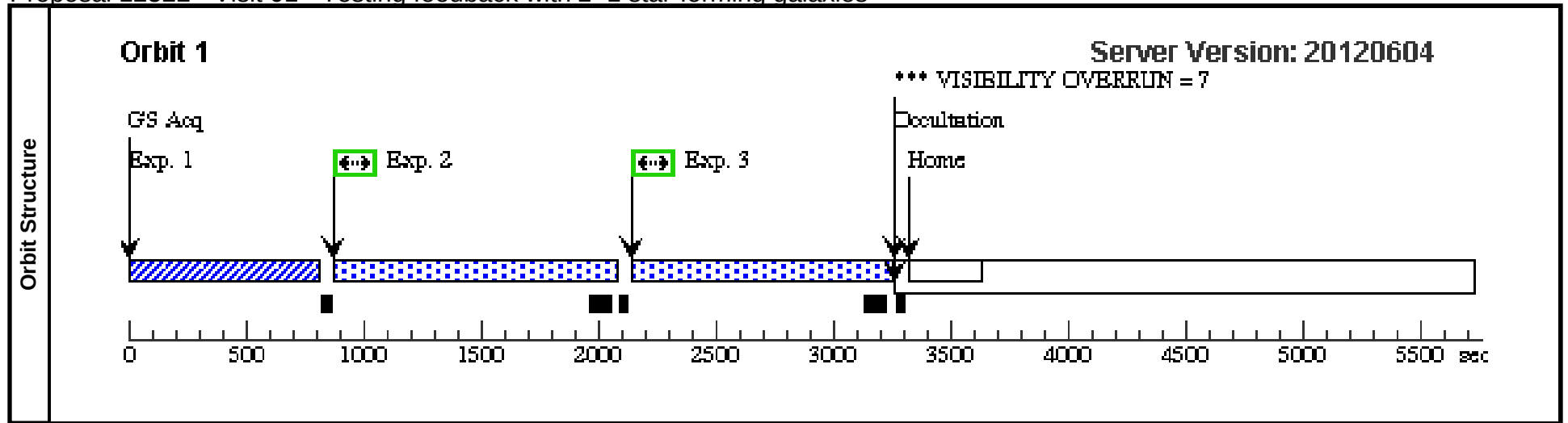
NA

CALIBRATION JUSTIFICATION

Standard.

Proposal 12522 - Visit 01 - Testing feedback with z=1 star-forming galaxies

Visit	Proposal 12522, Visit 01, scheduling Wed Jun 20 02:22:06 GMT 2012									
	Diagnostic Status: Warning Scientific Instruments: COS/NUV Special Requirements: (none)									
Diagnostics	(Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Form): If the target coordinates are not known to 0.4" (or better) an ACQ/SEARCH should precede the ACQ/IMAGE. (Visit 01) Warning (Form): For the best data quality, it is strongly recommended that all four FP-POS positions be used when observing at a given COS CENWAVE setting.									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	2QZJ0302-3216	RA: 03 02 49.6800 (45.7070000d) Dec: -32 16 0.90 (-32.26692d) Equinox: J2000		V=17.8 NUV=18.5	Reference Frame: ICRS				
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	Acq J0302 (COS.ta.179 767)	(1) 2QZJ0302-3216	COS/NUV, ACQ/IMAGE, PSA	MIRRORB		GS ACQ SCENARI O BASE1B3		190 Secs [==>]	[1]
	2	Science J03 02 (COS.sp.179 771)	(1) 2QZJ0302-3216	COS/NUV, TIME-TAG, PSA	G230L 3360 A	EXTENDED=NO; FP-POS=1; BUFFER-TIME=98 5; FLASH=YES			1085 Secs [==>1097.0 Secs]	[1]
	Comments: we are looking at HI absorption line at 2215									
	3	Science J03 02 (COS.sp.179 771)	(1) 2QZJ0302-3216	COS/NUV, TIME-TAG, PSA	G230L 3360 A	EXTENDED=NO; FP-POS=3; BUFFER-TIME=98 5; FLASH=YES			1085 Secs [==>1097.0 Secs]	[1]
	Comments: we are looking at HI absorption line at 2215									



Proposal 12522 - Visit 02 - Testing feedback with z=1 star-forming galaxies

Visit	Proposal 12522, Visit 02, scheduling Wed Jun 20 02:22:08 GMT 2012									
	Diagnostic Status: Warning Scientific Instruments: COS/NUV Special Requirements: (none)									
Diagnos	(Visit 02) Warning (Form): If the target coordinates are not known to 0.4" (or better) an ACQ/SEARCH should precede the ACQ/IMAGE.									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	SDSSJ1422-0001	RA: 14 22 53.3120 (215.7221333d) Dec: -00 01 49.14 (-.03032d) Equinox: J2000		V=18.9 NUV=19.9	Reference Frame: ICRS				
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	Acq J1422 (COS.ta.179 776)	(2) SDSSJ1422-0001	COS/NUV, ACQ/IMAGE, PSA	MIRRORA		GS ACQ SCENARI O BASE1B3		80 Secs [==>]	[1]
	2	Science J14 22 (COS.sp.179 778)	(2) SDSSJ1422-0001	COS/NUV, TIME-TAG, PSA	G230L 3360 A	EXTENDED=NO; FP-POS=ALL; FLASH=YES; BUFFER-TIME=20 00			2541 Secs [==>2443.0 Secs (Split 1)] [==>2949.0 Secs (Split 2)] [==>2949.0 Secs (Split 3)] [==>2949.0 Secs (Split 4)]	[1] [2] [3] [4]
	Comments: we are looking at HI absorption line at 2321									

Orbit 1

Exp. 1

GS Acq

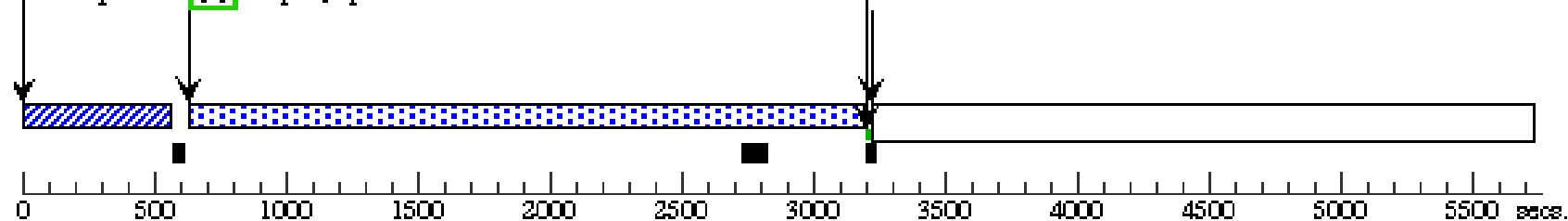


Exp. 2, split 1

Server Version: 20120604

Unused Visibility = 27

Occultation



Orbit 2

GS Reacq

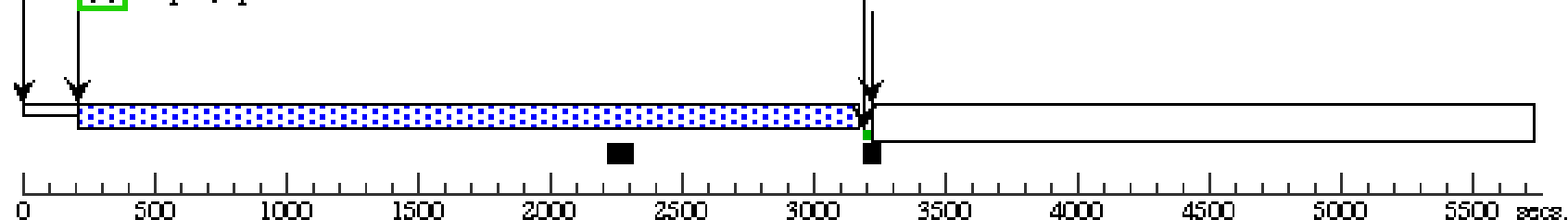


Exp. 2, split 2

Server Version: 20120604

Unused Visibility = 31

Occultation



Orbit 3

GS Reacq

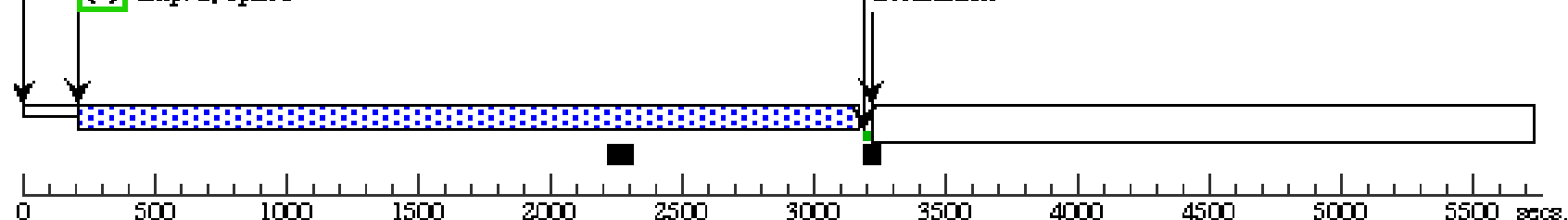


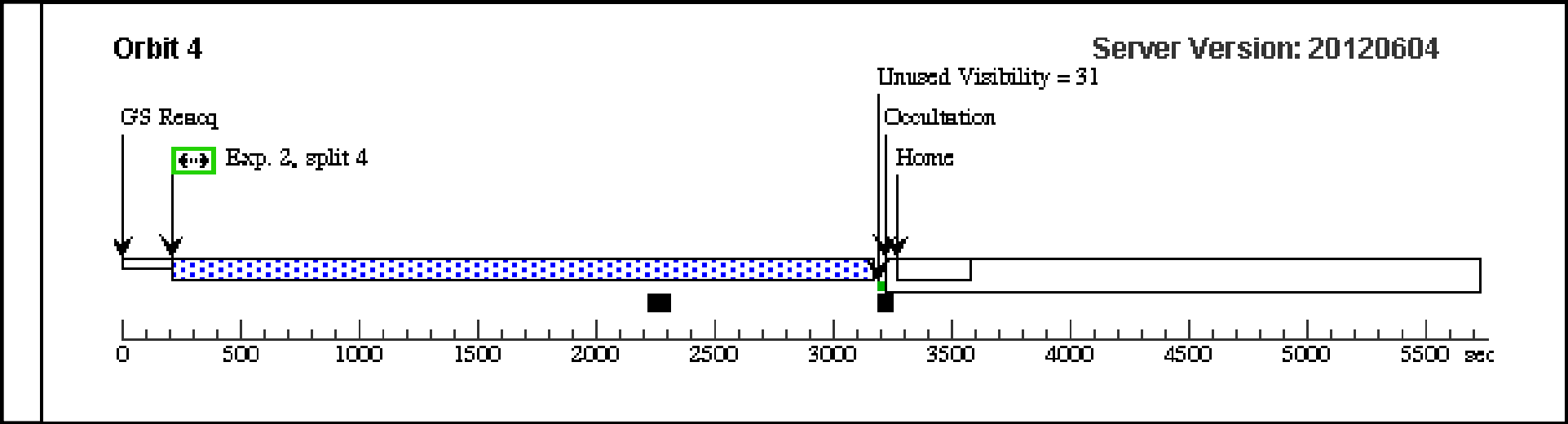
Exp. 2, split 3

Server Version: 20120604

Unused Visibility = 31

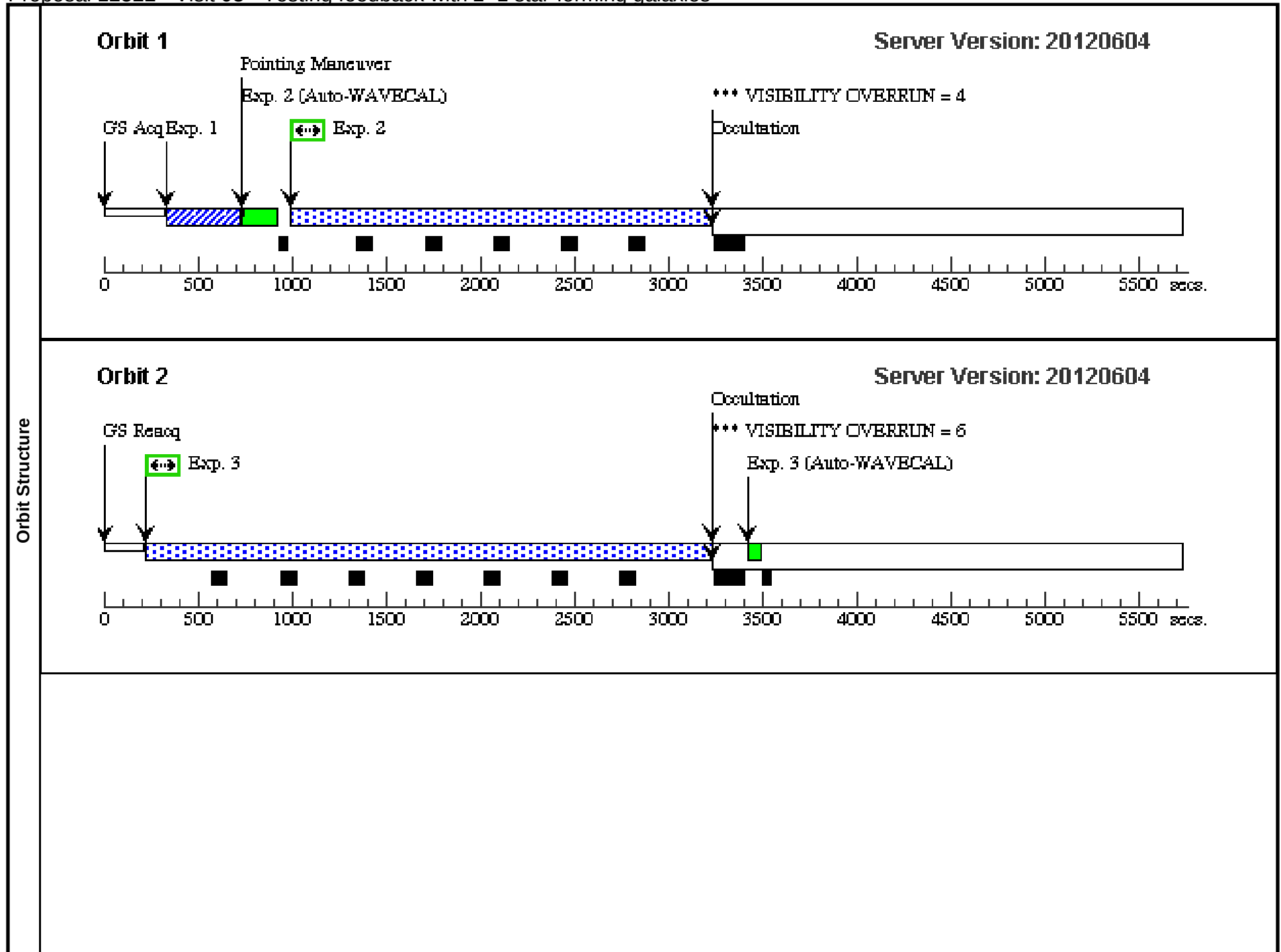
Occultation





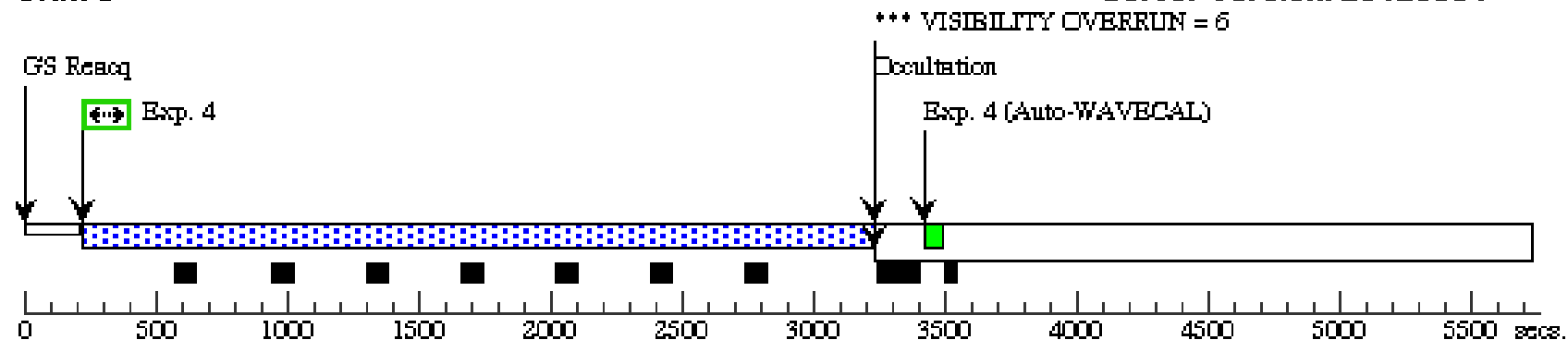
Proposal 12522 - Visit 03 - Testing feedback with z=1 star-forming galaxies

Visit	Proposal 12522, Visit 03, scheduling										Wed Jun 20 02:22:12 GMT 2012	
	Diagnostic Status: Warning											
	Scientific Instruments: STIS/CCD, STIS/NUV-MAMA											
	Special Requirements: (none)											
Diagnostics	(Visit 03) Warning (Orbit Planner): VISIBILITY OVERRUN											
	(Visit 03) Warning (Orbit Planner): STIS TIME-TAG EXPOSURE GENERATES HEAVY DATA VOLUME											
	(Visit 03) Warning (Orbit Planner): VISIBILITY OVERRUN											
	(Visit 03) Warning (Orbit Planner): VISIBILITY OVERRUN											
	(Visit 03) Warning (Orbit Planner): VISIBILITY OVERRUN											
	(Visit 03) Warning (Orbit Planner): VISIBILITY OVERRUN											
Fixed Targets												
	#	Name		Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(3)	SDSSJ0147+1258		RA: 01 47 17.7600 (26.8240000d) Dec: +12 58 8.80 (12.96911d) Equinox: J2000				V=18.0 NUV=20.5		Reference Frame: ICRS		
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	Acq J0147 (STIS.ta.234 786)	(3) SDSSJ0147+125 8	STIS/CCD, ACQ, F28X50LP		MIRROR	ACQTYPE=POINT			40 Secs		
										[==>]	[1]	
	Comments: target has r=18mag											
	2	Science J01 47 (STIS.sp.23 4788)	(3) SDSSJ0147+125 8	STIS/NUV-MAMA, TIME-TAG, 52X0.2		G230L 2376 A	BUFFER-TIME=36 0			2100 Secs		
										[==>2223.0 Secs]	[1]	
	Comments: we are looking at HI absorption line at 2480											
	3	Science J01 47 (STIS.sp.23 4788)	(3) SDSSJ0147+125 8	STIS/NUV-MAMA, TIME-TAG, 52X0.2		G230L 2376 A	BUFFER-TIME=36 0			2400 Secs		
										[==>2995.0 Secs]	[2]	
	Comments: we are looking at HI absorption line at 2480											
	4	Science J01 47 (STIS.sp.23 4788)	(3) SDSSJ0147+125 8	STIS/NUV-MAMA, TIME-TAG, 52X0.2		G230L 2376 A	BUFFER-TIME=36 0			2400 Secs		
										[==>2995.0 Secs]	[3]	
	Comments: we are looking at HI absorption line at 2480											
5	Science J01 47 (STIS.sp.23 4788)	(3) SDSSJ0147+125 8	STIS/NUV-MAMA, TIME-TAG, 52X0.2		G230L 2376 A	BUFFER-TIME=36 0			2400 Secs			
									[==>2995.0 Secs]	[4]		
Comments: we are looking at HI absorption line at 2480												
6	Science J01 47 (STIS.sp.23 4788)	(3) SDSSJ0147+125 8	STIS/NUV-MAMA, TIME-TAG, 52X0.2		G230L 2376 A	BUFFER-TIME=36 0			2400 Secs			
									[==>2995.0 Secs]	[5]		
Comments: we are looking at HI absorption line at 2480												



Orbit 3

Server Version: 20120604



Orbit 4

Server Version: 20120604

