12214 - Low redshift damped Lyman alpha systems selected by 21cm absorption: A new route to high efficiency?

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) UM-305	COS/NUV	1	07-Jul-2010 22:00:20.0	yes
02	(2) B0801+303	COS/NUV	2	07-Jul-2010 22:00:25.0	yes
03	(3) HB89-1430-178	COS/NUV	5	07-Jul-2010 22:00:30.0	yes
04	(4) J1623+0718	COS/NUV	4	07-Jul-2010 22:00:35.0	yes
05	(5) HB89-2355-106	COS/NUV	4	07-Jul-2010 22:00:40.0	yes

16 Total Orbits Used

ABSTRACT

The identification of z<1.6 damped Lyman alpha (DLA) systems requires UV spectroscopy, but blind surveys are less than 10% efficient at finding them, making low z DLA surveys unpalatable for precious HST resources. Pre-selecting QSOs which exhibit strong intervening MgII absorption has increased the detection effiency to 35%. However, the last survey for low z DLAs was carried out 8 years ago and (combined with previous archival

data) still only yielded 41 DLAs, compared to ~1000 known systems at z>2. In this proposal, we aim to test a new selection technique, whereby we pre-select DLA candidates towards radio-loud QSOs which exhibit both MgII absorption AND 21cm absorption in optical and radio spectra respectively We expect this technique to be close to 100% efficient, but UV spectroscopy is the final step in the proof of concept. In this short pilot proposal we will observe five 21cm absorbers to confirm their DLA nature and pave the way for larger samples in the future. These data will also yield 5 new temperature measurements of the ISM in the 1<z<1.7 "redshift desert" where only 1 previous measurement exists, hence providing a 6-fold improvement and immediate science return, in addition to establishing the success of the technique.

OBSERVING DESCRIPTION

This program aims to observe QSOs in order to obtain spectra covering the lyman alpha transition at redshifts 1<z<1.5. Target S/N values are around 10 (or more) per resolution element.

For each target 2 FP-POS values (3 and 4) are used. Coordinates are taken from the GSC2 and therefore ACQ/IMAGE is used in the acquisition (according to updated acquisition information). Buffer times are set to be equal to exposure times.

Visit

Proposal 12214, Visit 01 Thu Jul 08 02:00:44 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV

Special Requirements: (none)

Comments: This visit to observe Lyman alpha in absorption at z=1.37, so the feature is at 2881 A.

Fixed Targets

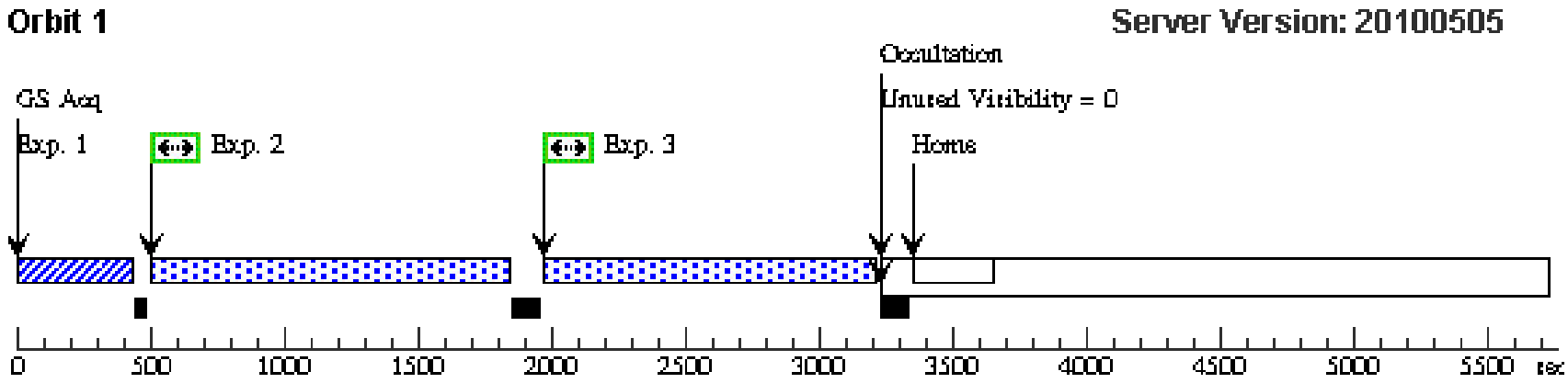
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	UM-305	RA: 01 08 26.8400 (17.1118333d)	Redshift: 1.37	V=17.9	Reference Frame: ICRS
	Alt Name1: S03O003189	Dec: -00 37 23.94 (-.62332d)		NUV=18.8	
		Equinox: J2000			

Comments: Target coords taken from GSC2 (GSC2 name given as alternate)

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACQ/IMAGE	(1) UM-305	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				15 Secs	
								[==>]	***[1]***
2	Science 2950 FP3	(1) UM-305	COS/NUV, TIME-TAG, PSA	G230L	FP-POS=3;			1227 Secs	
				2950 A	BUFFER-TIME=1227;			*[==>]*	***[1]***
					FLASH=YES				
3	Science 2950 FP4	(1) UM-305	COS/NUV, TIME-TAG, PSA	G230L	FP-POS=4;			1227 Secs	
				2950 A	BUFFER-TIME=1227;			*[==>]*	***[1]***
					FLASH=YES				

Orbit Structure



Visit

Proposal 12214, Visit 02 Thu Jul 08 02:00:45 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV

Special Requirements: (none)

Comments: This visit to observe Lyman alpha in absorption at z=1.19, so the feature is at 2662 A.

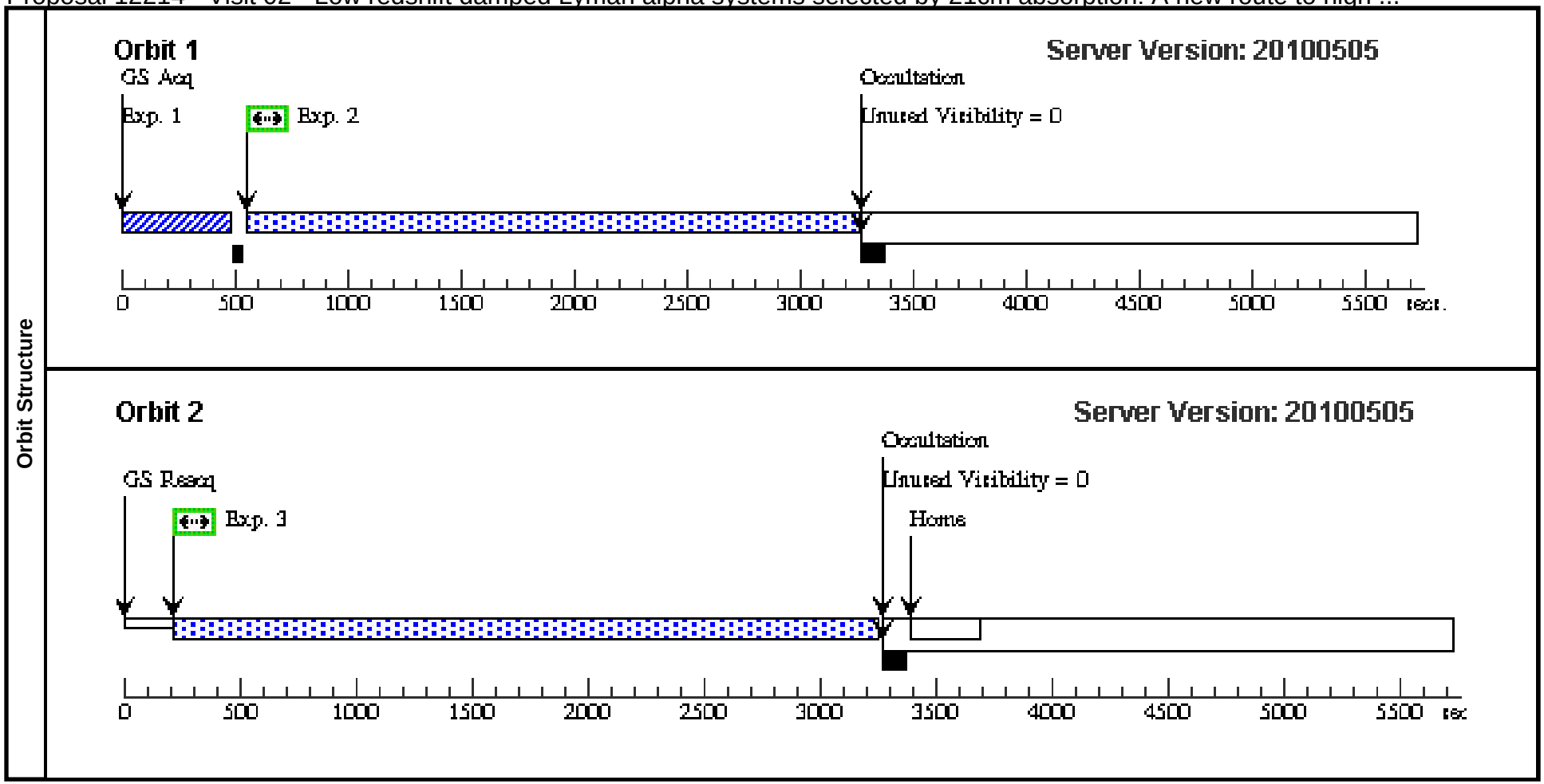
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	B0801+303	RA: 08 04 42.2380 (121.1759917d)	Redshift: 1.45	V=18.3	Reference Frame: ICRS
	Alt Name1: N9E3015563	Dec: +30 12 36.95 (30.21026d)		NUV=19.8	
		Equinox: J2000			

Comments: Target coords taken from GSC2 (GSC2 name given as alternate)

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACQ/IMAGE	(2) B0801+303	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				40 Secs	
								[==>]	***[1]***
2	Science 2635 FP3	(2) B0801+303	COS/NUV, TIME-TAG, PSA	G230L 2635 A	FP-POS=3; BUFFER-TIME=2593; FLASH=YES			2593 Secs	
								[==>]	***[1]***
3	Science 2635 FP4	(2) B0801+303	COS/NUV, TIME-TAG, PSA	G230L 2635 A	FP-POS=4; BUFFER-TIME=3026; FLASH=YES			3026 Secs	
								[==>]	***[2]***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sec.
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sec

Visit

Proposal 12214, Visit 03 Thu Jul 08 02:00:46 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV

Special Requirements: (none)

Comments: This visit to observe Lyman alpha in absorption at z=1.33, so the feature is at 2833 A.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	HB89-1430-178	RA: 14 32 57.6710 (218.2402958d)	Redshift: 2.33	V=18.7	Reference Frame: ICRS
	Alt Name1: S8YZ003012	Dec: -18 01 35.22 (-18.02645d)		NUV=20.7	
		Equinox: J2000			

Comments: Target coords taken from GSC2 (GSC2 name given as alternate)

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACQ/IMAGE	(3) HB89-1430-178	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				80 Secs	
								[==>]	***[1]***
2	Science 2950 FP3	(3) HB89-1430-178	COS/NUV, TIME-TAG, PSA	G230L 2950 A	FP-POS=3; BUFFER-TIME=2487; FLASH=YES			2487 Secs	
								[==>]	***[1]***
3	Science 2950 FP3-2	(3) HB89-1430-178	COS/NUV, TIME-TAG, PSA	G230L 2950 A	FP-POS=3; BUFFER-TIME=3000; FLASH=YES			3000 Secs	
								[==>]	***[2]***
4	Science 2950 FP3-3	(3) HB89-1430-178	COS/NUV, TIME-TAG, PSA	G230L 2950 A	FP-POS=3; BUFFER-TIME=3000; FLASH=YES			3000 Secs	
								[==>]	***[3]***
5	Science 2950 FP4	(3) HB89-1430-178	COS/NUV, TIME-TAG, PSA	G230L 2950 A	FP-POS=4; BUFFER-TIME=3000; FLASH=YES			3000 Secs	
								[==>]	***[4]***
6	Science 2950 FP4-2	(3) HB89-1430-178	COS/NUV, TIME-TAG, PSA	G230L 2950 A	FP-POS=4; BUFFER-TIME=3000; FLASH=YES			3000 Secs	
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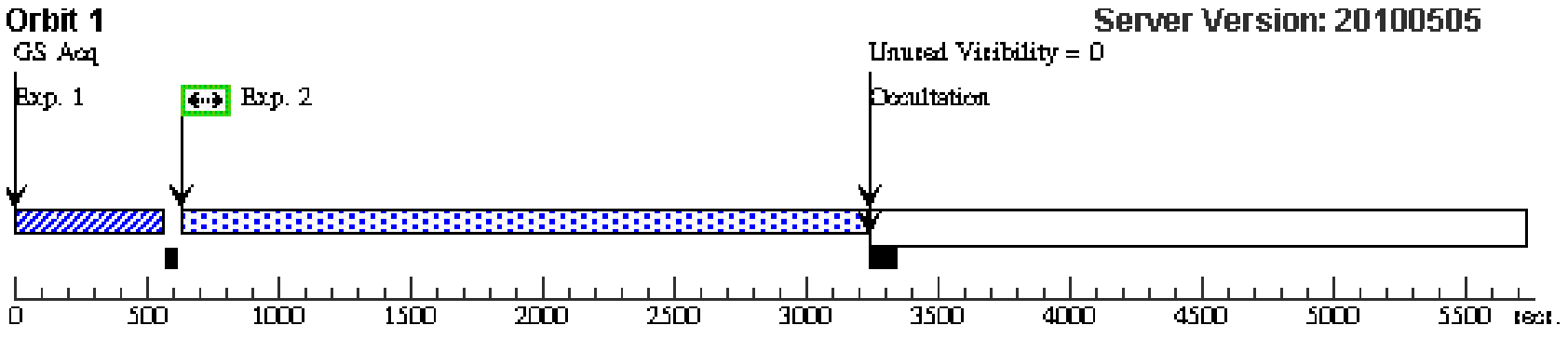
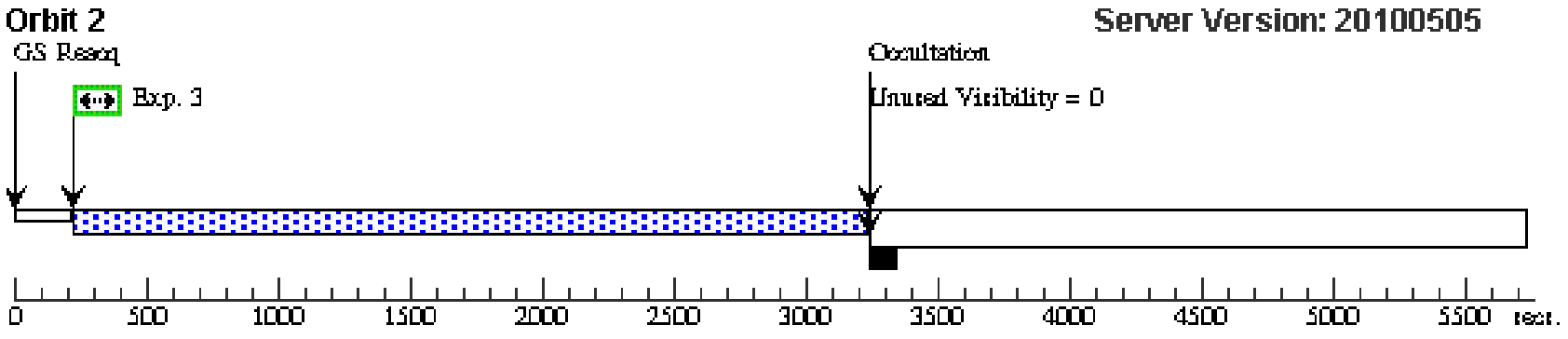
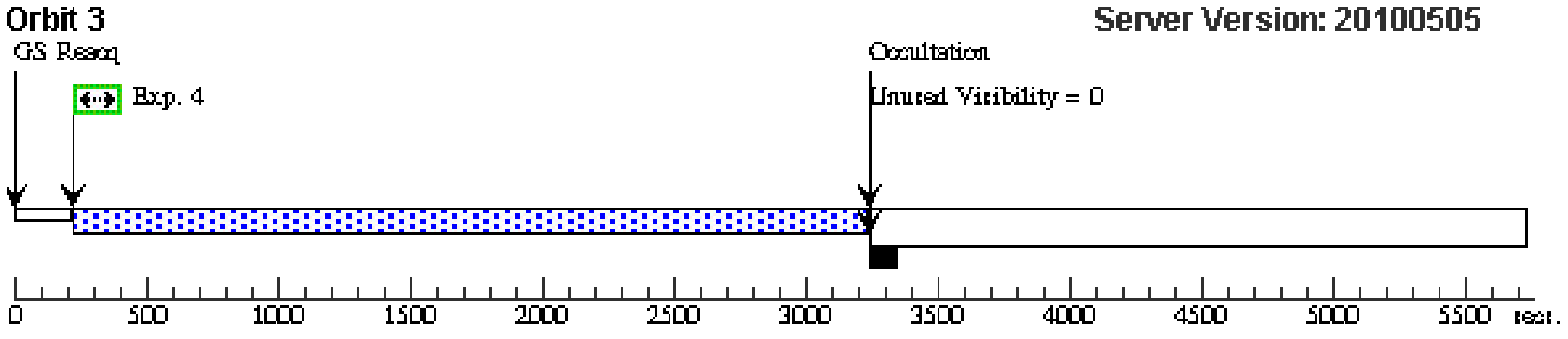
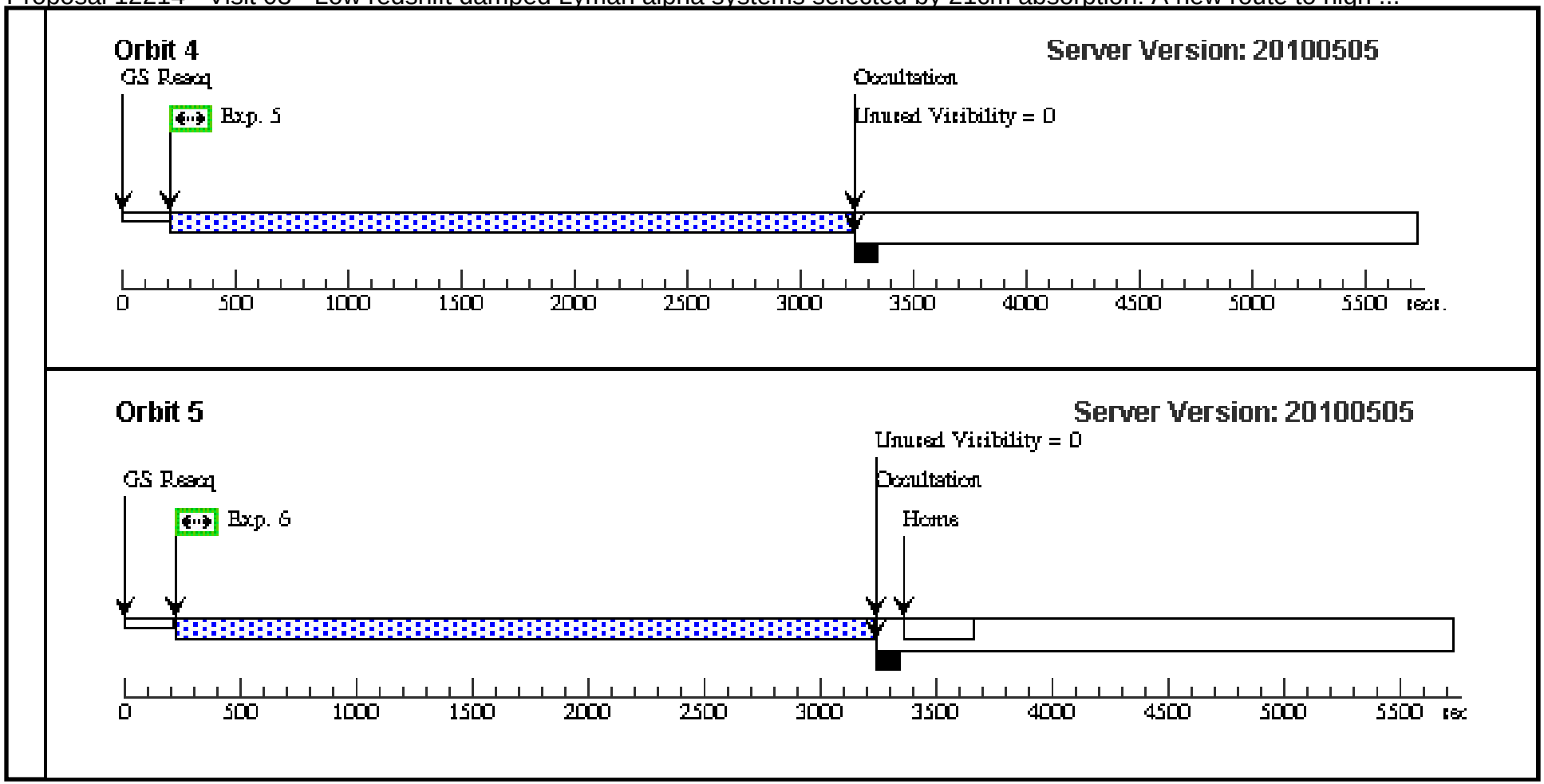
Orbit Structure





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sec

Visit

Proposal 12214, Visit 04 Thu Jul 08 02:00:47 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV

Special Requirements: (none)

Comments: This visit to observe Lyman alpha in absorption at z=1.34, so the feature is at 2845 A.

Fixed Targets

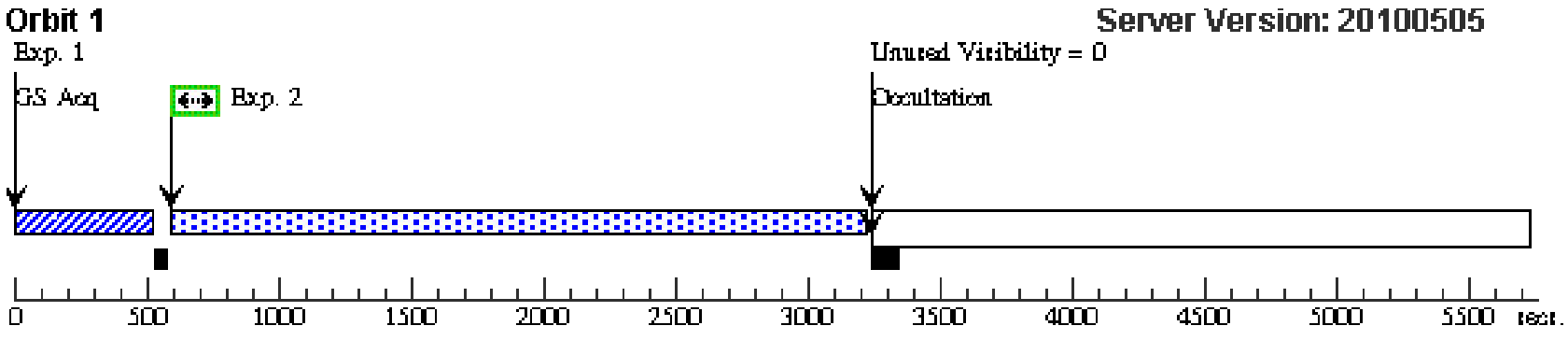
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(4)	J1623+0718	RA: 16 23 46.2540 (245.9427250d)	Redshift: 1.65	V=17.7	Reference Frame: ICRS
	Alt Name1: N3MJ008735	Dec: +07 18 54.75 (7.31521d)			
		Equinox: J2000			

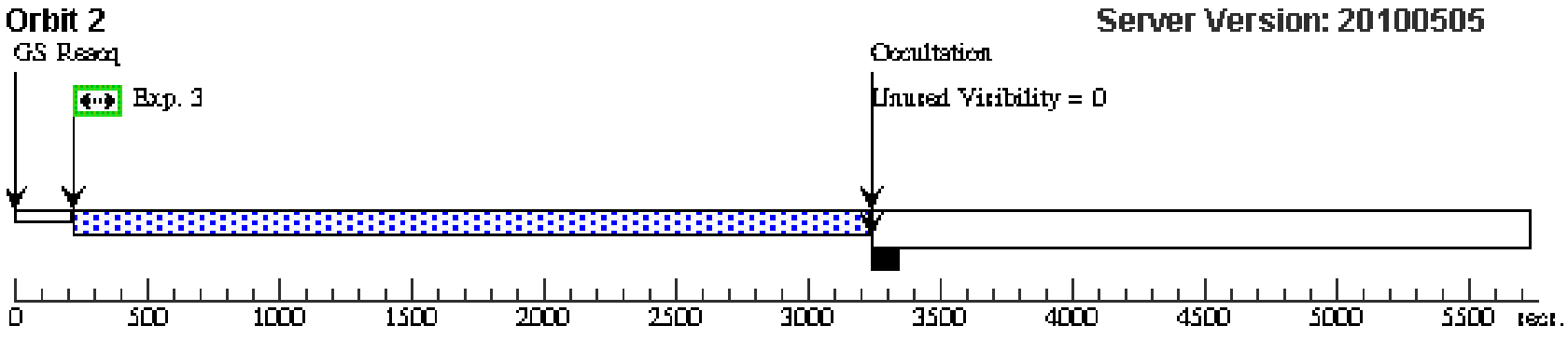
Comments: Target coords taken from GSC2 (GSC2 name given as alternate)

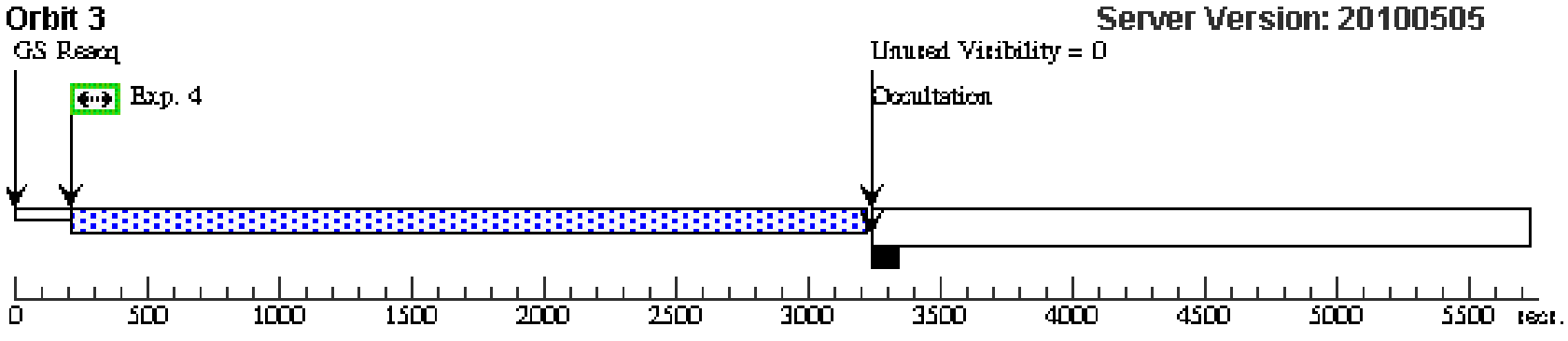
Exposures

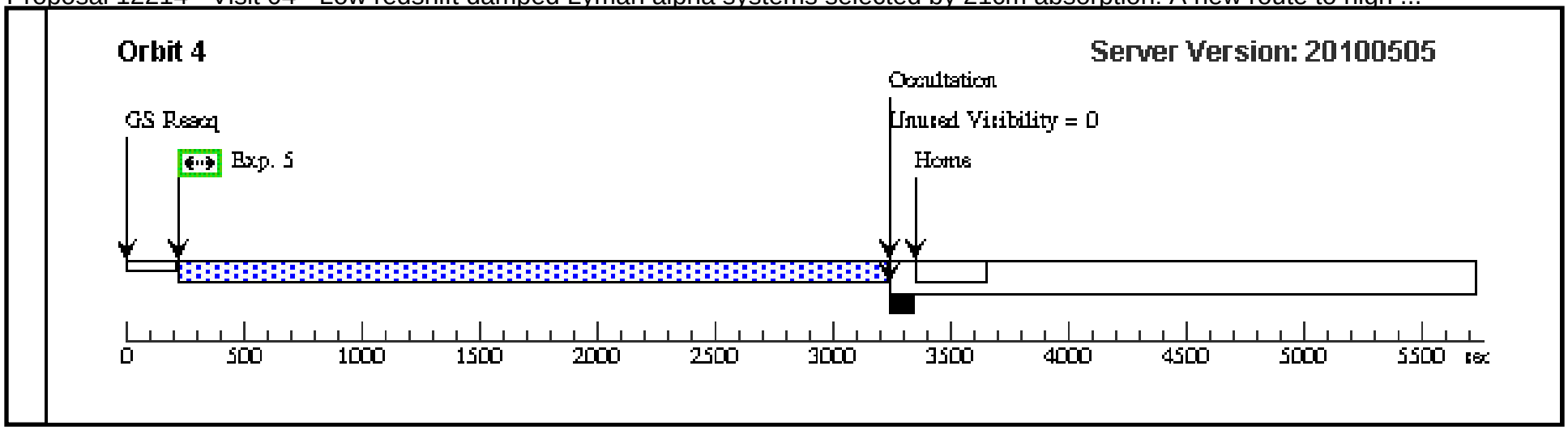
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACQ/IMAGE	(4) J1623+0718	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				60 Secs	
								[==>]	***[1]***
2	Science 2950 FP3	(4) J1623+0718	COS/NUV, TIME-TAG, PSA	G230L 2950 A	FP-POS=3; BUFFER-TIME=2520; FLASH=YES			2520 Secs	
								[==>]	***[1]***
3	Science 2950 FP3-2	(4) J1623+0718	COS/NUV, TIME-TAG, PSA	G230L 2950 A	FP-POS=3; BUFFER-TIME=2993; FLASH=YES			2993 Secs	
								[==>]	***[2]***
4	Science 2950 FP4	(4) J1623+0718	COS/NUV, TIME-TAG, PSA	G230L 2950 A	FP-POS=4; BUFFER-TIME=2993; FLASH=YES			2993 Secs	
								[==>]	***[3]***
5	Science 2950 FP4-2	(4) J1623+0718	COS/NUV, TIME-TAG, PSA	G230L 2950 A	FP-POS=4; BUFFER-TIME=2993; FLASH=YES			2993 Secs	
								[==>]	***[4]***

Orbit Structure





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Visit

Proposal 12214, Visit 05 Thu Jul 08 02:00:48 GMT 2010

Diagnostic Status: No Diagnostics

Scientific Instruments: COS/NUV

Special Requirements: (none)

Comments: This visit to observe Lyman alpha in absorption at z=1.17, so the feature is at 2638 A.

Fixed Targets

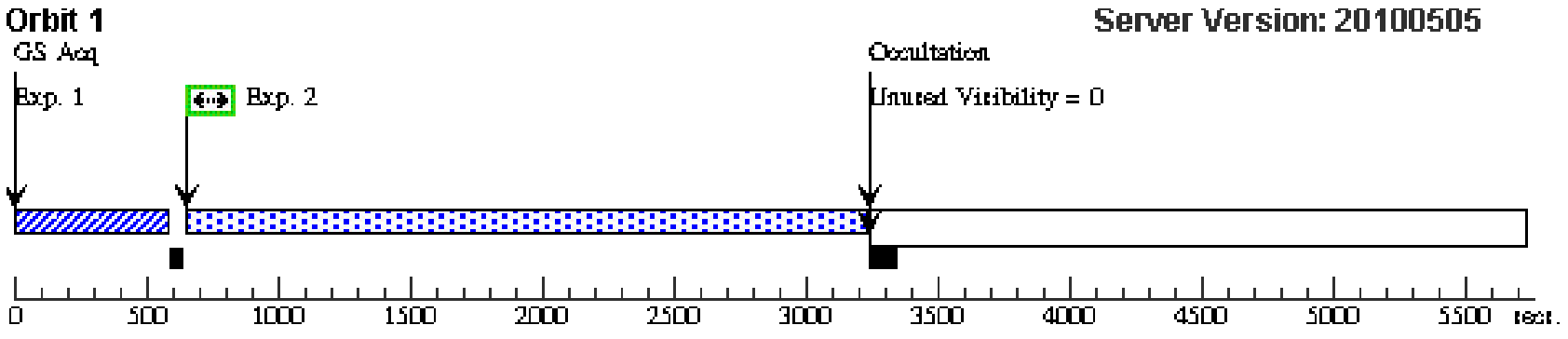
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(5)	HB89-2355-106	RA: 23 58 10.8840 (359.5453500d)	Redshift: 1.64	V=18.8	Reference Frame: ICRS
	Alt Name1: SB34001938	Dec: -10 20 8.43 (-10.33567d)		NUV=20.7	
		Equinox: J2000			

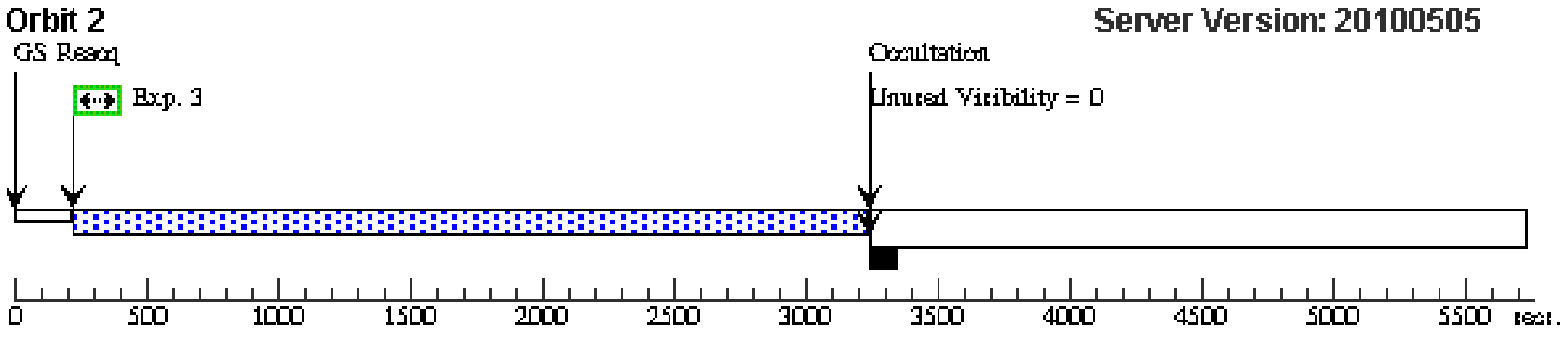
Comments: Target coords taken from GSC2 (GSC2 name given as alternate)

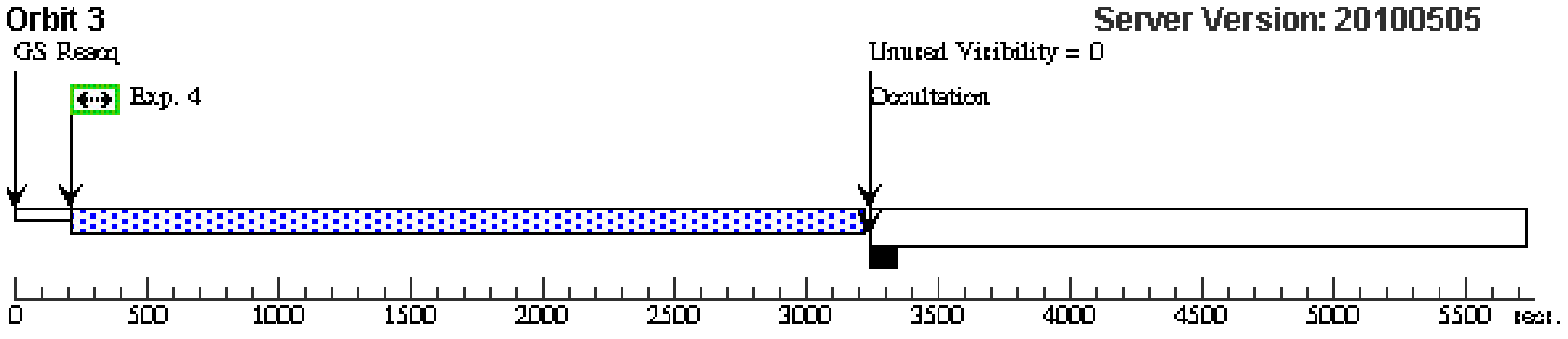
Exposures

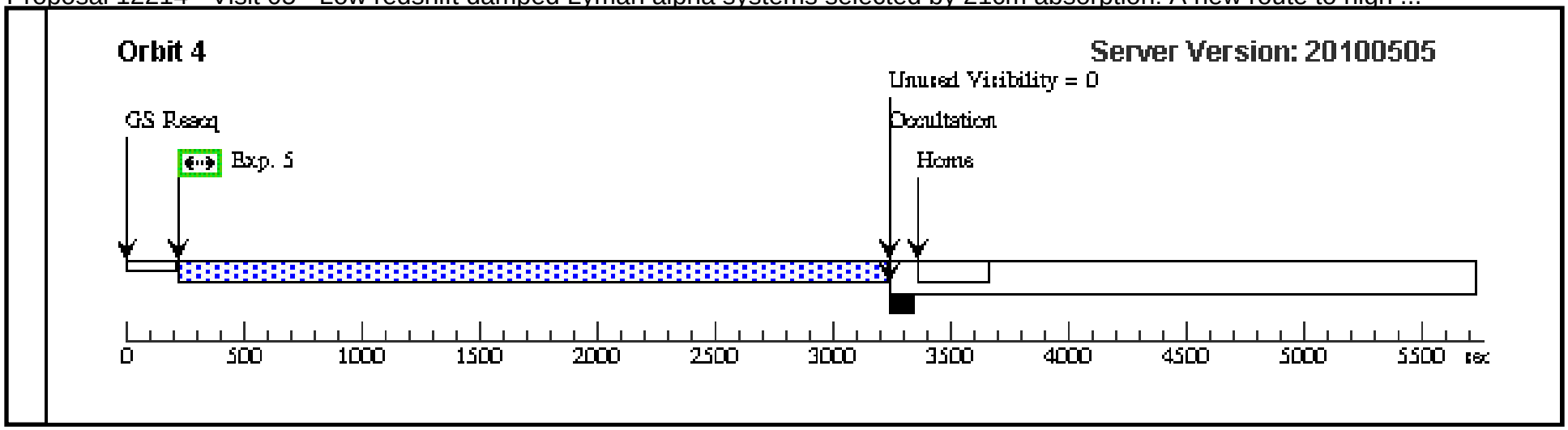
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1	ACQ/IMAGE	(5) HB89-2355-106	COS/NUV, ACQ/IMAGE, PSA	MIRRORA				90 Secs *[==>]*	 ***[1]***
2	Science 2635 FP3	(5) HB89-2355-106	COS/NUV, TIME-TAG, PSA	G230L 2635 A	FP-POS=3; BUFFER-TIME=2463; FLASH=YES			2463 Secs *[==>]*	 ***[1]***
3	Science 2635 FP3-2	(5) HB89-2355-106	COS/NUV, TIME-TAG, PSA	G230L 2635 A	FP-POS=3; BUFFER-TIME=2996; FLASH=YES			2996 Secs *[==>]*	 ***[2]***
4	Science 2635 FP4	(5) HB89-2355-106	COS/NUV, TIME-TAG, PSA	G230L 2635 A	FP-POS=4; BUFFER-TIME=2996; FLASH=YES			2996 Secs *[==>]*	 ***[3]***
5	Science 2635 FP4-2	(5) HB89-2355-106	COS/NUV, TIME-TAG, PSA	G230L 2635 A	FP-POS=4; BUFFER-TIME=2996; FLASH=YES			2996 Secs *[==>]*	 ***[4]***

Orbit Structure





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