



# 16210 - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Cycle: 28, Proposal Category: GO  
(Availability Mode: SUPPORTED)

## INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
<b>Dr. Xin Liu (PI) (Contact)</b>	<b>University of Illinois at Urbana - Champaign</b>	<b>xinliuxl@illinois.edu</b>
Mr. Yu-Ching Chen (CoI)	University of Illinois at Urbana - Champaign	ycchen@illinois.edu
Dr. Hsiang-Chih Hwang (CoI)	Institute For Advanced Study	hchwang@ias.edu
Dr. Yue Shen (CoI)	University of Illinois at Urbana - Champaign	shenyue@illinois.edu
Dr. Nadia L Zakamska (CoI)	The Johns Hopkins University	zakamska@jhu.edu

## 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) J0241+7801 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:14.0	yes
02	(2) J0246+6922 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:15.0	yes
03	(3) J0749+2255 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:15.0	yes
04	(4) J0753+4247 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:16.0	yes
41	(4) J0753+4247 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:17.0	yes

<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>
42	(4) J0753+4247 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:18.0	yes
05	(5) J0823+2418 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:18.0	yes
06	(6) J0841+4825 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:19.0	yes
07	(7) J0904+3332 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:20.0	yes
08	(8) J0536+5038 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:20.0	yes
09	(9) J1613-2644 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:21.0	yes
10	(10) J1755+4229 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:22.0	yes
50	(10) J1755+4229 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:23.0	yes
60	(10) J1755+4229 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:23.0	yes
11	(11) J1852+4833 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:24.0	yes
12	(12) J0748+3146 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:25.0	yes
13	(13) J2048+6258 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:26.0	yes
14	(14) J2122-0026 CCDFLAT	STIS/CCD	1	12-Jan-2022 12:00:27.0	yes

18 Total Orbits Used

## ABSTRACT

Dual quasars are expected to be common in the hierarchical structure formation paradigm. Despite their significance, no confirmed dual quasar is known with  $<10$  kpc separations at  $1 < z < 3$ , in stark contrast to theoretical expectations. We propose STIS (G750L) slit spectroscopy for 14 double-

Proposal 16210 (STScI Edit Number: 5, Created: Wednesday, January 12, 2022 at 12:00:27 PM Eastern Standard Time) - Overview  
core quasars to systematically discover close dual or lensed SMBHs at redshifts  $1 < z < 3$  for the first time. Our sample probes a new regime at higher redshifts and smaller merger separations than previous work - crucial for understanding the significance of mergers in triggering quasar activity in the cosmic "high noon". Our targets are selected using the new astrometric technique: when two close-by AGN vary stochastically, their combined light centroid shifts, which is detectable by Gaia. Follow-up HST imaging of Gaia-selected targets has uncovered double-cored morphology with nuclear separations of  $\sim 0.3''$ - $0.6''$ . The proposed STIS spectra will reject interlopers such as chance superpositions with stars/galaxies to unambiguously confirm the targets as dual or lensed quasars. The results will provide empirical constraints on the merger rate of supermassive black holes and therefore on the stochastic gravitational wave background from binary supermassive black holes.

### **OBSERVING DESCRIPTION**

This program will perform STIS (G750L) slit spectroscopy for 14 double-core quasars to spectrally and spatially resolve the two cores.

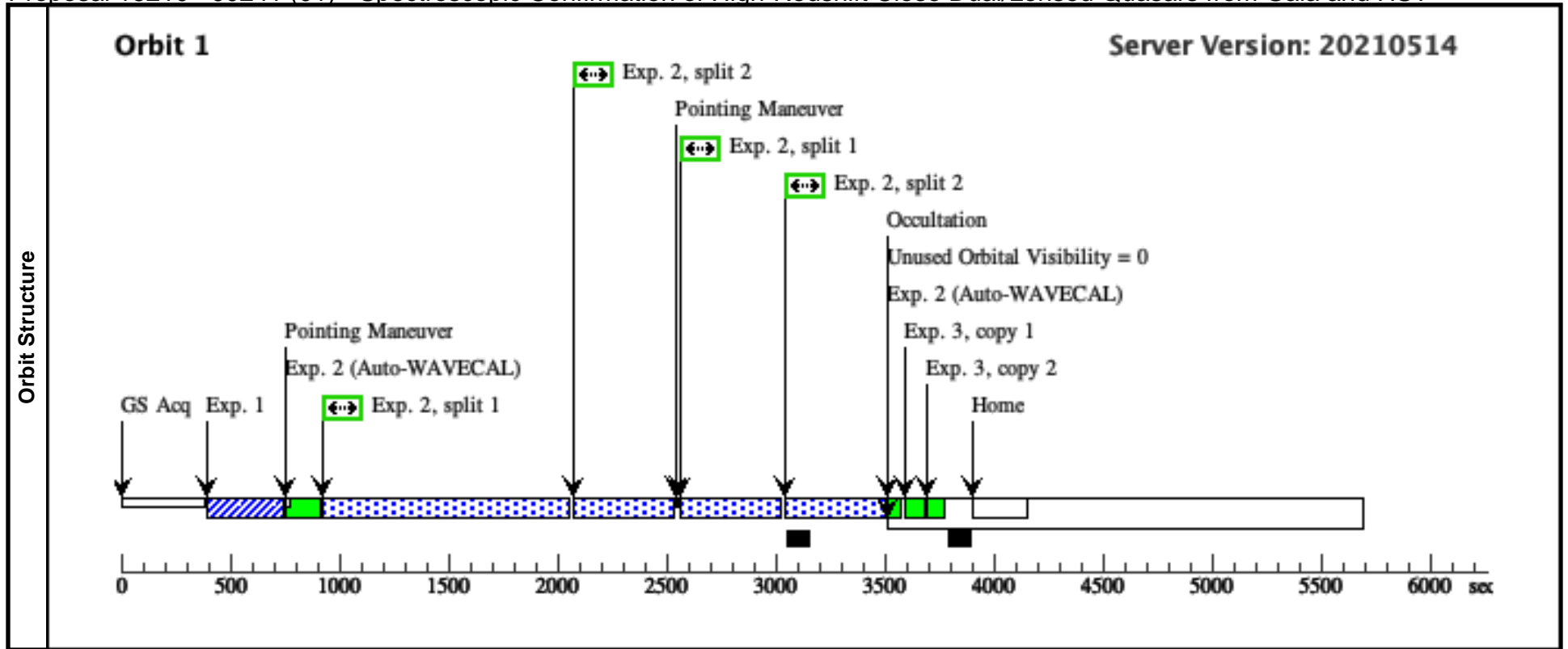
We will use the  $52 \times 0.2''$  slit and the G750L aperture. The slit will be placed across both cores to obtain the spectrum for both components. The separation between the two cores is typically 0.3-0.6 arcsec, and we will use the point-source mode for acquisition. The conversion between the PA of the two cores and the ORIENT parameter is:  $\text{ORIENT} = \text{PA} + 45.35$  or  $\text{ORIENT} = \text{PA} + 225.35$  according to Table 11.2 of the STIS Instrument Handbook.

Each visit consists of 1 orbit, with one acquisition exposure followed by the science exposure, and the CCD flats.

Proposal 16210 - J0241 (01) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

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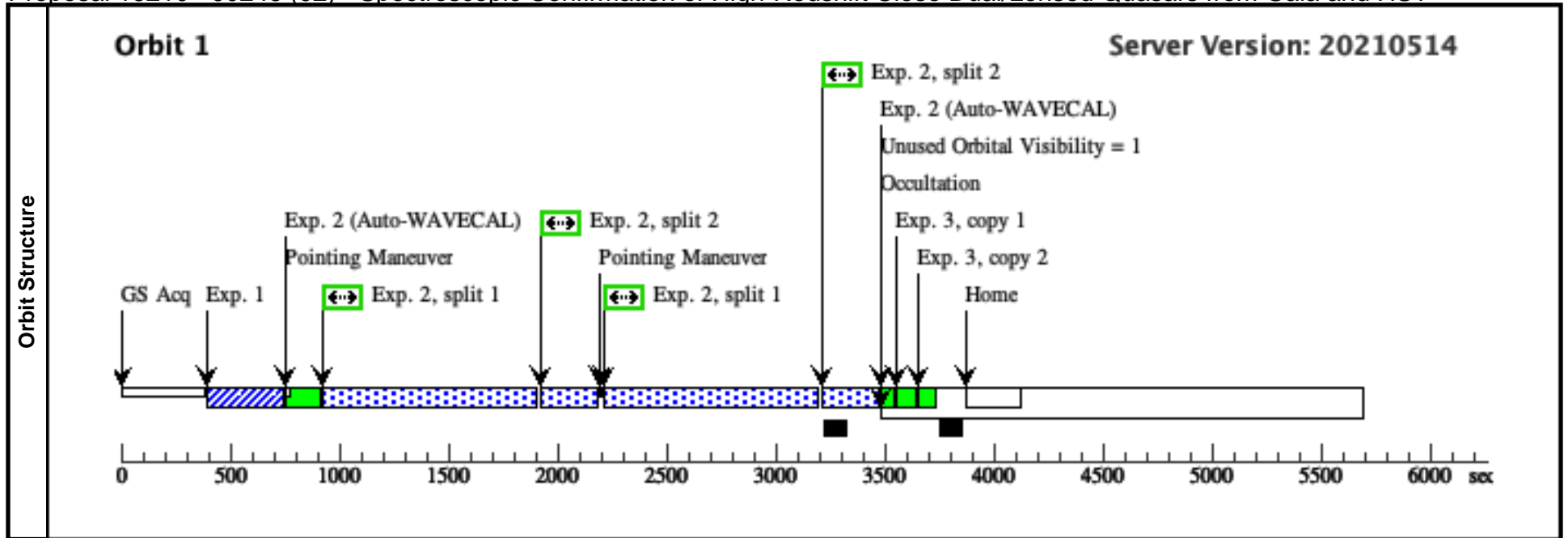
Visit	<b>Proposal 16210, J0241 (01), scheduling</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 172.15D TO 172.15 D; ORIENT 352.15D TO 352.15 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=1.0	Center Pattern=false							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(1)	J0241+7801	RA: 02 41 34.9200 (40.3955000d) Dec: +78 01 7.10 (78.01864d) Equinox: J2000			V=18.87	Reference Frame: ICRS			
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8926)	(1) J0241+7801	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs)	
									[==>]	[1]
	2	J0241	(1) J0241+7801	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in J0241 (01) (1)	1200 Secs (2384 Secs)	
								[==>1100.0 Secs (Pattern 1, Split 1)]		
								[==>428.0 Secs (Pattern 1, Split 2)]		
								[==>428.0 Secs (Pattern 2, Split 1)]		
								[==>428.0 Secs (Pattern 2, Split 2)]		
	3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)]	
								[==>(Copy 2)]		
									[1]	



Proposal 16210 - J0246 (02) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:27 GMT 2022

Visit	<b>Proposal 16210, J0246 (02), completed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 94.55D TO 94.55 D; ORIENT 274.55D TO 274.55 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						(2)
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=1.0	Center Pattern=false							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(2)	J0246+6922	RA: 02 46 28.6300 (41.6192917d) Dec: +69 22 34.00 (69.37611d) Equinox: J2000			V=18.75	Reference Frame: ICRS			
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8953)	(2) J0246+6922	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs)	
									[==>]	[1]
	2	J0246	(2) J0246+6922	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in J0246 (02) (1)	1000 Secs (2350 Secs)	
								[==>947.0 Secs (Pattern 1, Split 1)] [==>228.0 Secs (Pattern 1, Split 2)] [==>947.0 Secs (Pattern 2, Split 1)] [==>228.0 Secs (Pattern 2, Split 2)]	[1]	
	3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]



Proposal 16210 - J0749 (03) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

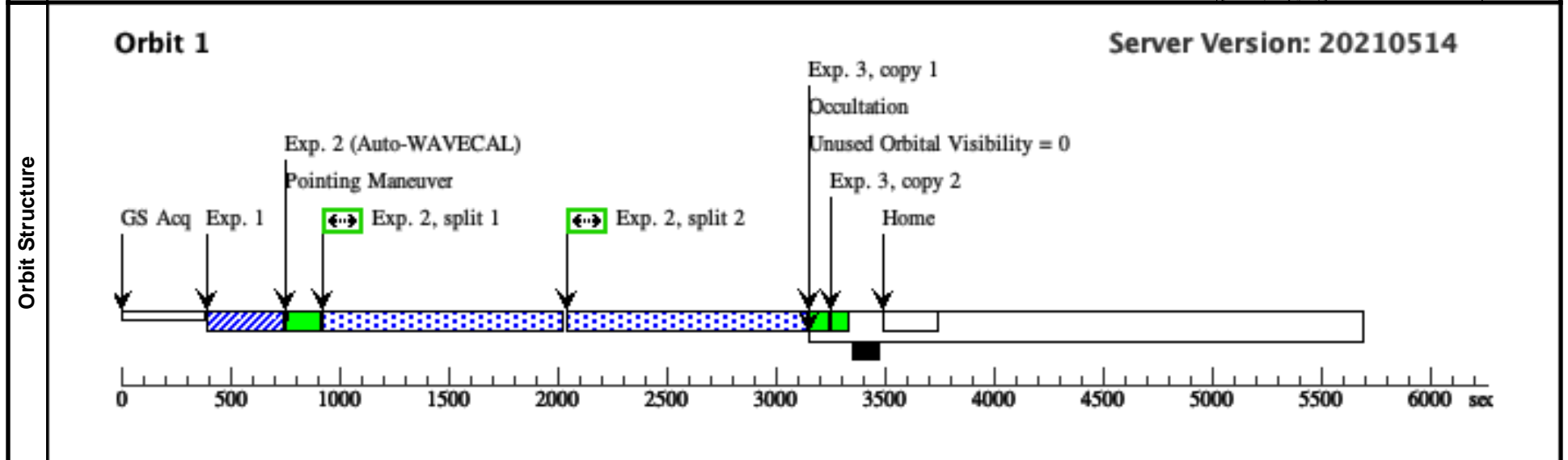
Wed Jan 12 17:00:28 GMT 2022

<b>Visit</b>	Proposal 16210, J0749 (03), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: STIS/CCD				
	Special Requirements: ORIENT 101.45D TO 101.45 D; ORIENT 281.45D TO 281.45 D				

<b>Fixed Targets</b>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(3)	J0749+2255	RA: 07 49 22.9700 (117.3457083d) Dec: +22 55 11.80 (22.91994d) Equinox: J2000		V=18.7	Reference Frame: ICRS

Comments:  
Category=GALAXY  
Description=[QSO, QUASAR]

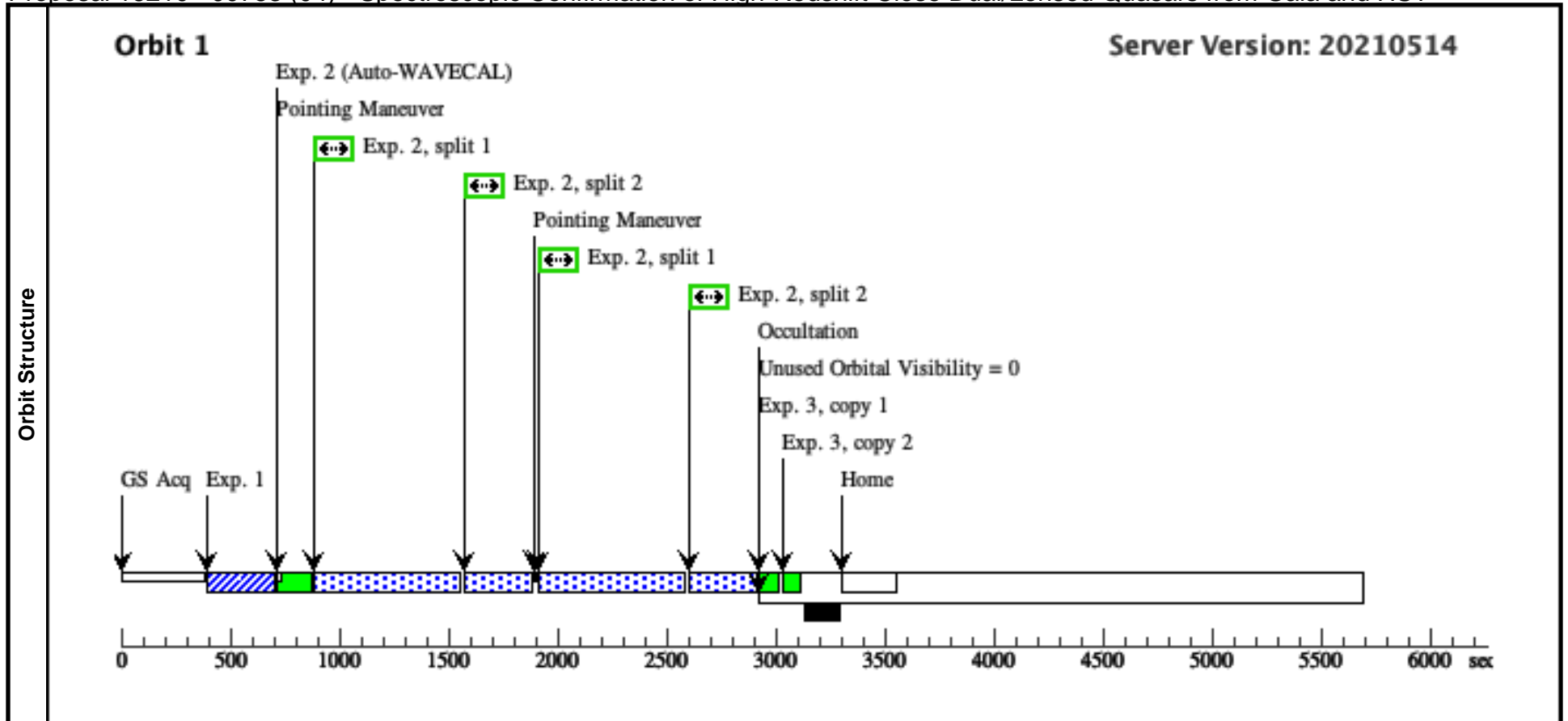
<b>Exposures</b>	#	Label (ETC Run)	Target	Config, Mode, Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	
	1	acq (STIS.ta.144 8953)	(3) J0749+2255	STIS/CCD, ACQ, F28X50LP	MIRROR		ACQTYPE=POINT			30 Secs (30 Secs)	
	2	J0749	(3) J0749+2255	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A		CR-SPLIT=2			2000 Secs (2136 Secs)	
	3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A					[=>1068.0 Secs (Split 1)] [=>1068.0 Secs (Split 2)]	[1]



Proposal 16210 - J0753 (04) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

Visit	<b>Proposal 16210, J0753 (04), scheduled</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: SCHED 100%; ORIENT 352.25D TO 352.25 D; ORIENT 172.25D TO 172.25 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=1.0	Center Pattern=false							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(4)	J0753+4247	RA: 07 53 50.5770 (118.4607375d) Dec: +42 47 43.91 (42.79553d) Equinox: J2000			V=18.14	Reference Frame: ICRS			
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8967)	(4) J0753+4247	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			20 Secs (20 Secs)	
									[==>]	[1]
	2	J0753	(4) J0753+4247	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in J0753 (04) (1)	1200 Secs (1834 Secs)	
								[==>639.0 Secs (Pattern 1, Split 1)] [==>278.0 Secs (Pattern 1, Split 2)] [==>639.0 Secs (Pattern 2, Split 1)] [==>278.0 Secs (Pattern 2, Split 2)]	[1]	
3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]	



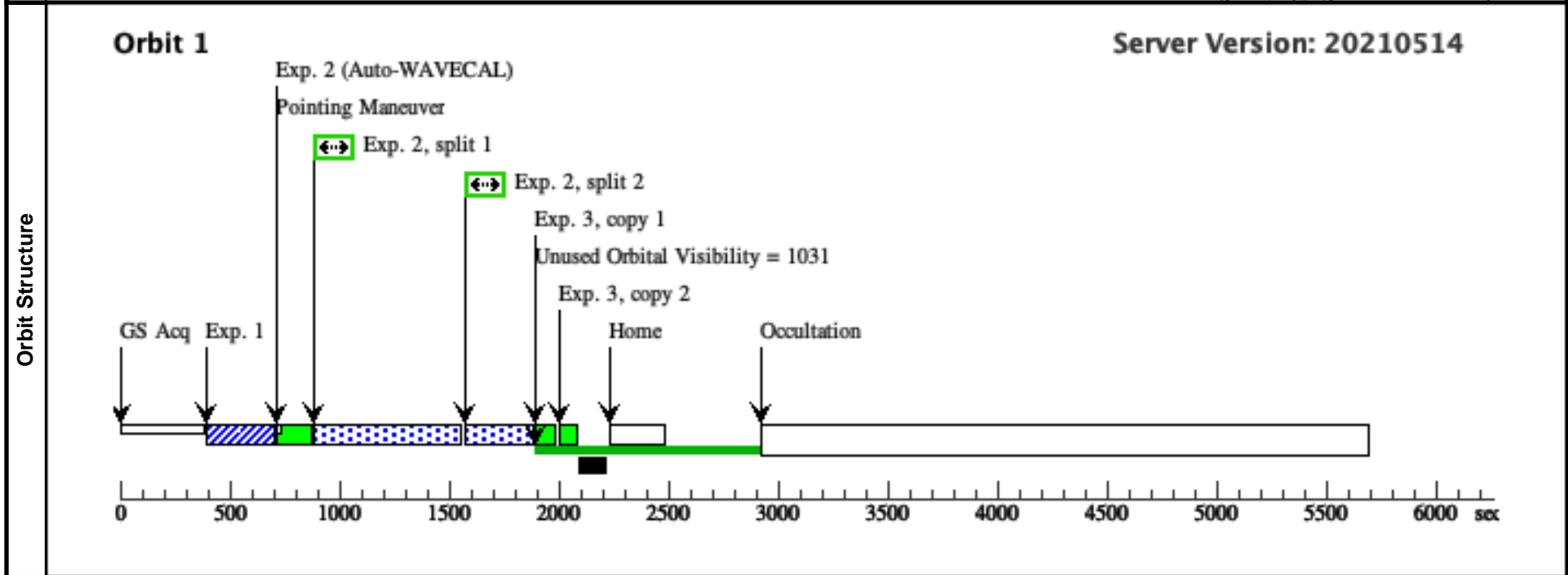
Proposal 16210 - J0753 (41) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

<b>Visit</b>	<b>Proposal 16210, J0753 (41)</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: SCHED 100%; ORIENT 172.25D TO 172.25 D Comments: First of two new visit replacing 04				

<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>
	(4)	J0753+4247	RA: 07 53 50.5770 (118.4607375d) Dec: +42 47 43.91 (42.79553d) Equinox: J2000		V=18.14	Reference Frame: ICRS
Comments: Category=GALAXY Description=[QSO, QUASAR]						

<b>Exposures</b>	<b>#</b>	<b>Label (ETC Run)</b>	<b>Target</b>	<b>Config, Mode, Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time (Total)/[Actual Dur.]</b>	<b>Orbit</b>
	1	acq (STIS.ta.144 8967)	(4) J0753+4247	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			20 Secs (20 Secs)	
	2	J0753	(4) J0753+4247	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2			1200 Secs (917 Secs)	
	3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]



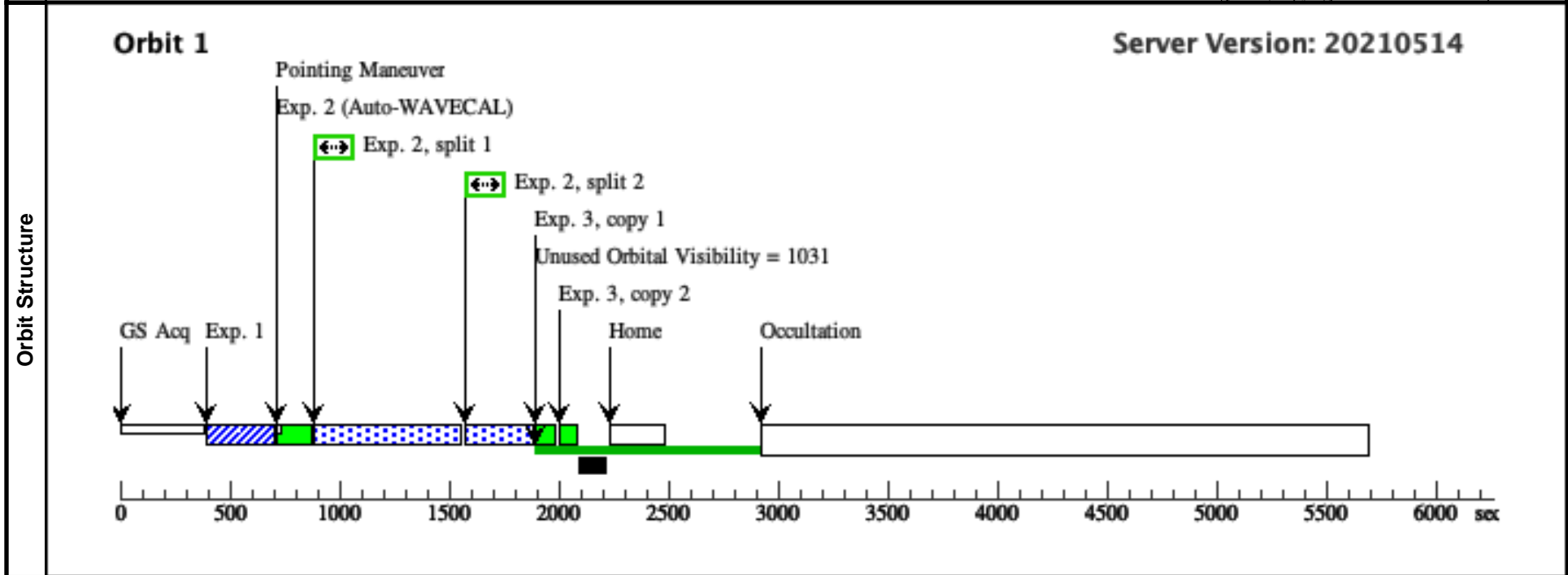
Proposal 16210 - J0753 (42) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

<b>Visit</b>	<b>Proposal 16210, J0753 (42)</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: SCHED 100%; ORIENT 172.25D TO 172.25 D Comments: <i>Second of two new visit replacing 04</i>				

<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>	<b>Fluxes</b>	<b>Miscellaneous</b>
	(4)	J0753+4247	RA: 07 53 50.5770 (118.4607375d) Dec: +42 47 43.91 (42.79553d) Equinox: J2000		V=18.14	Reference Frame: ICRS
Comments: Category=GALAXY Description=[QSO, QUASAR]						

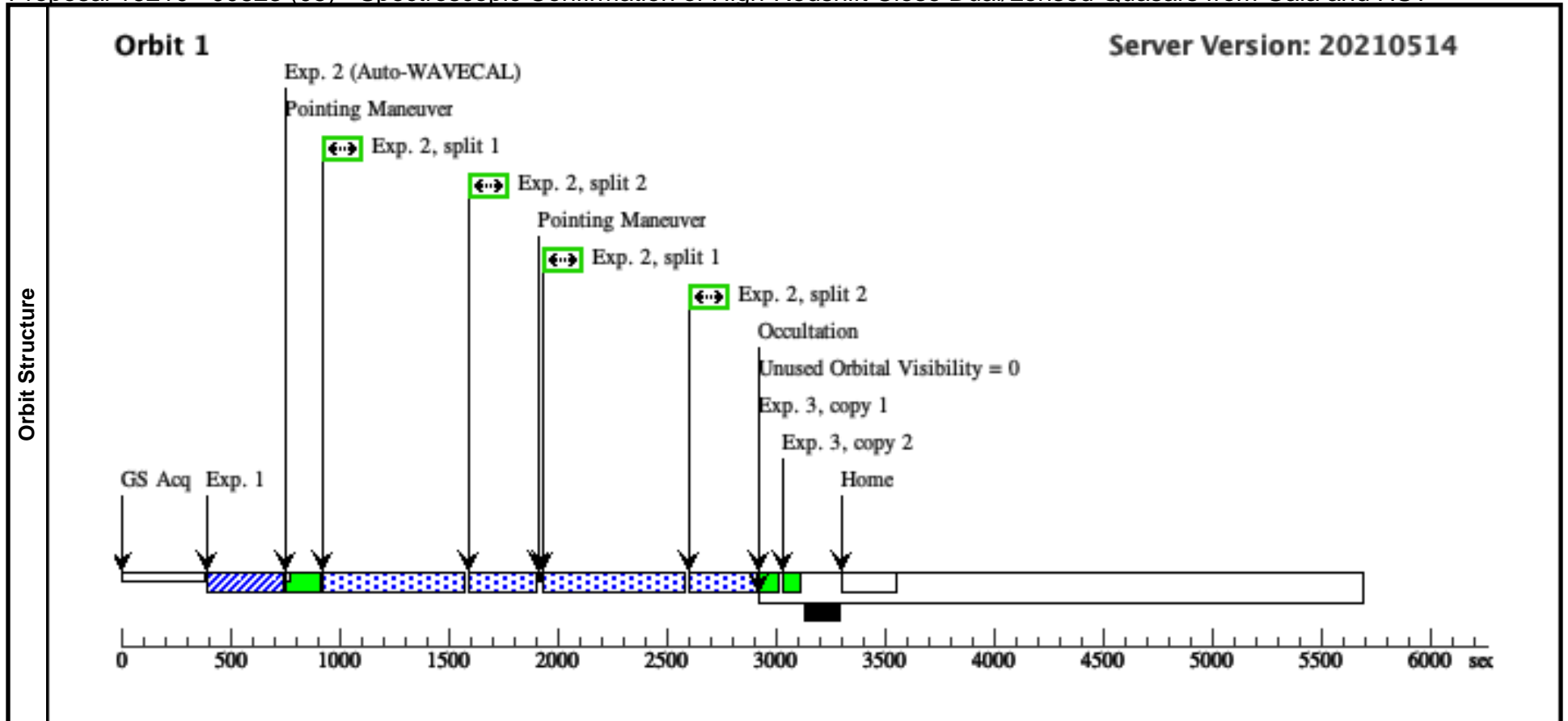
<b>Exposures</b>	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8967)	(4) J0753+4247	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			20 Secs (20 Secs)	
	2	J0753	(4) J0753+4247	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2	POS TARG null,1		1200 Secs (917 Secs)	
	3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>639.0 Secs (Split 1)] [==>278.0 Secs (Split 2)]	[1]
								[==>(Copy 1)] [==>(Copy 2)]	[1]	



Proposal 16210 - J0823 (05) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

Visit	Proposal 16210, J0823 (05), scheduled Diagnostic Status: No Diagnostics Scientific Instruments: STIS/CCD Special Requirements: SCHED 100%; ORIENT 228.55D TO 228.55 D; ORIENT 48.55D TO 48.55 D									
	Patterns	#	Primary Pattern				Secondary Pattern			Exposures
		(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=1.0	Center Pattern=false							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous	
	(5)	J0823+2418	RA: 08 23 41.0700 (125.9211250d)	Dec: +24 18 5.40 (24.30150d)			V=18.78		Reference Frame: ICRS	
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8953)	(5) J0823+2418	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs)	
									[==>]	[1]
	2	J0823	(5) J0823+2418	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in J0823 (05) (1)	1200 Secs (1794 Secs)	
									[==>619.0 Secs (Pattern 1, Split 1)] [==>278.0 Secs (Pattern 1, Split 2)] [==>619.0 Secs (Pattern 2, Split 1)] [==>278.0 Secs (Pattern 2, Split 2)]	[1]
3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]	



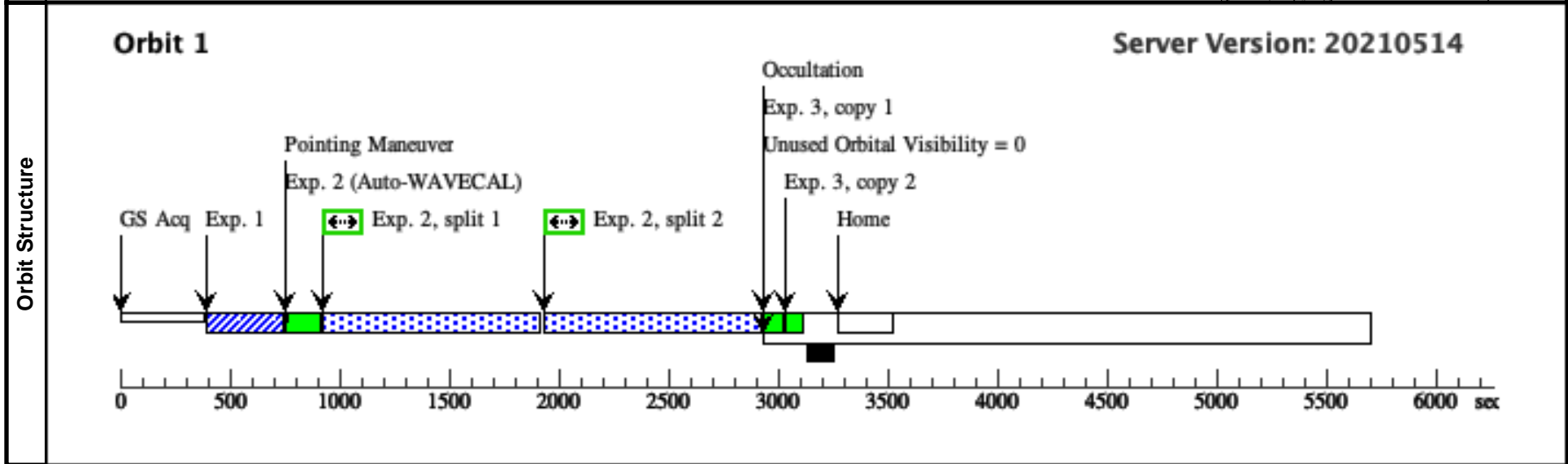
Proposal 16210 - J0841 (06) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

<b>Visit</b>	Proposal 16210, J0841 (06), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: STIS/CCD				
	Special Requirements: SCHED 100%; ORIENT 177.35D TO 177.35 D; ORIENT 357.35D TO 357.35 D				

<b>Fixed Targets</b>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(6)	J0841+4825	RA: 08 41 29.7700 (130.3740417d) Dec: +48 25 48.30 (48.43008d) Equinox: J2000		V=18.78	Reference Frame: ICRS
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]					

<b>Exposures</b>	#	Label (ETC Run)	Target	Config, Mode, Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8953)	(6) J0841+4825	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs) [==>]	[1]
	2	J0841	(6) J0841+4825	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A	CR-SPLIT=2			2000 Secs (1912 Secs) [==>956.0 Secs (Split 1)] [==>956.0 Secs (Split 2)]	[1]
	3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]



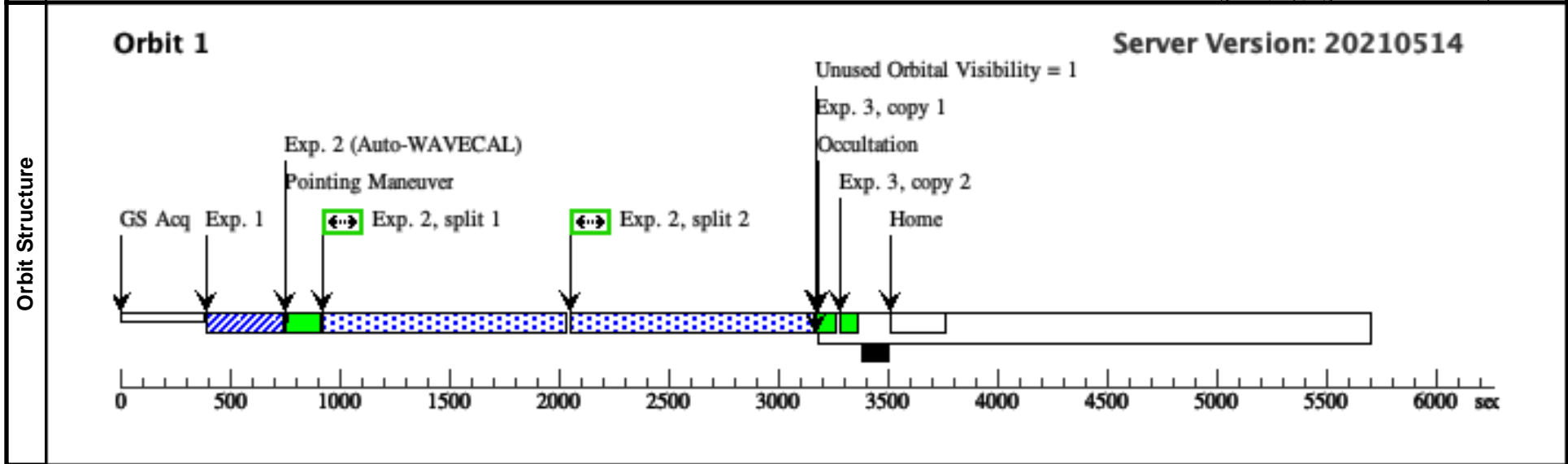
Proposal 16210 - J0904 (07) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

<b>Visit</b>	Proposal 16210, J0904 (07), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: STIS/CCD				
	Special Requirements: ORIENT 149.55D TO 149.55 D: ORIENT 329.55D TO 329.55 D				

<b>Fixed Targets</b>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(7)	J0904+3332	RA: 09 04 8.6800 (136.0361667d) Dec: +33 32 5.10 (33.53475d) Equinox: J2000		V=18.5	Reference Frame: ICRS
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]					

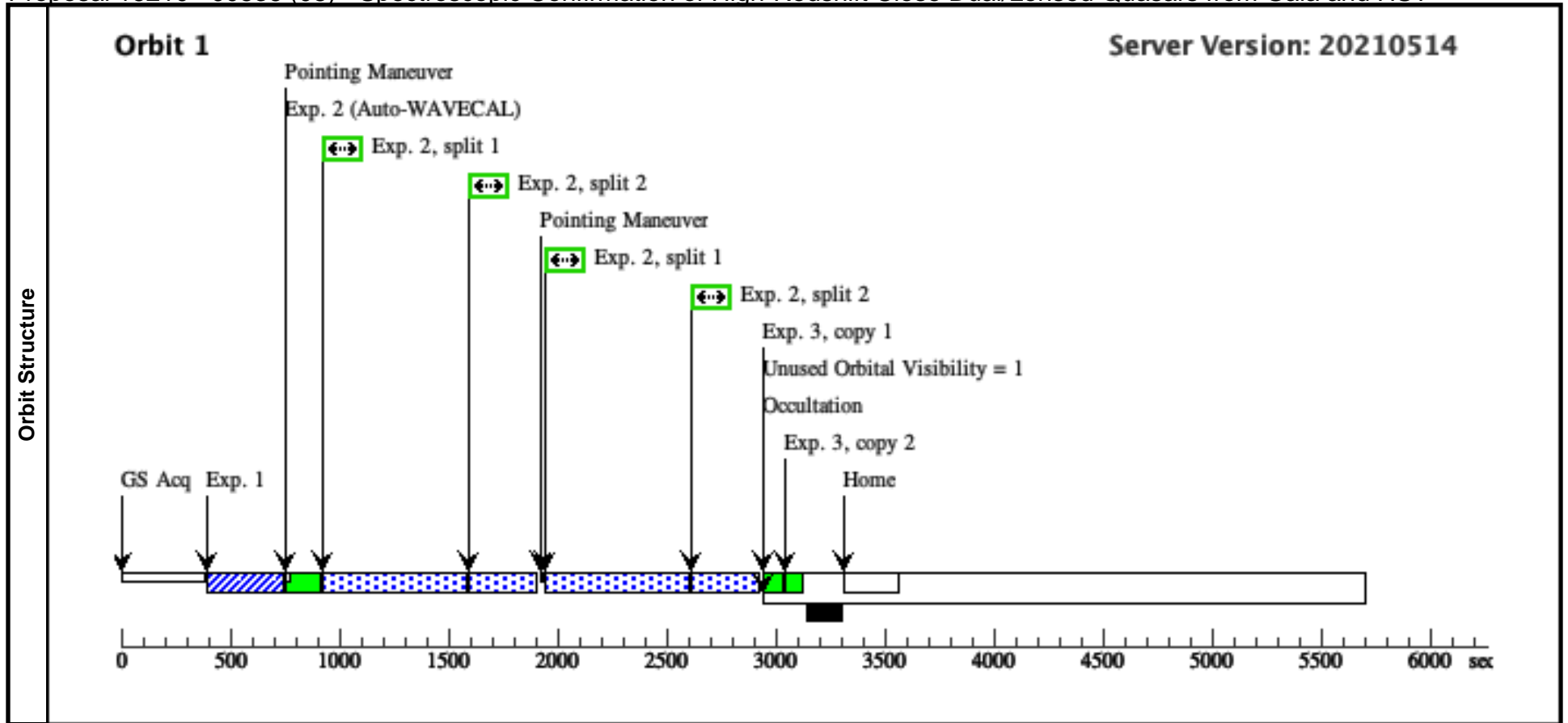
<b>Exposures</b>	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8953)	(7) J0904+3332	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs) [==>]	[1]
	2	J0904	(7) J0904+3332	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A	CR-SPLIT=2			2000 Secs (2158 Secs) [==>1079.0 Secs (Split 1)] [==>1079.0 Secs (Split 2)]	[1]
	3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]



Proposal 16210 - J0536 (08) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

Visit	Proposal 16210, J0536 (08), completed Diagnostic Status: No Diagnostics Scientific Instruments: STIS/CCD Special Requirements: SCHED 100%; ORIENT 27.65D TO 27.65 D; ORIENT 207.65D TO 207.65 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=1.0	Center Pattern=false							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(8)	J0536+5038	RA: 05 36 20.2300 (84.0842917d) Dec: +50 38 26.20 (50.64061d) Equinox: J2000			V=17.86	Reference Frame: ICRS			
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8953)	(8) J0536+5038	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs)	
									[==>]	[1]
	2	J0536	(8) J0536+5038	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in J0536 (08) (1)	1200 Secs (1806 Secs)	
								[==>625.0 Secs (Pattern 1, Split 1)] [==>278.0 Secs (Pattern 1, Split 2)] [==>625.0 Secs (Pattern 2, Split 1)] [==>278.0 Secs (Pattern 2, Split 2)]	[1]	
3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]	



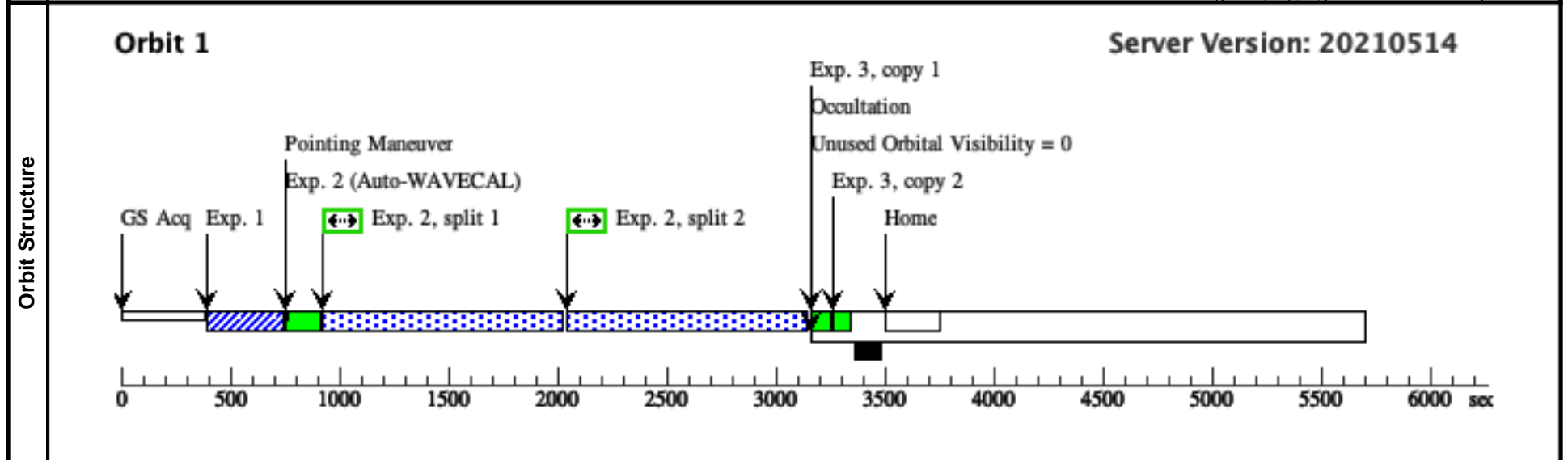
Proposal 16210 - J1613 (09) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

<b>Visit</b>	Proposal 16210, J1613 (09), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: STIS/CCD				
	Special Requirements: ORIENT 295.85D TO 295.85 D: ORIENT 115.85D TO 115.85 D				

<b>Fixed Targets</b>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(9)	J1613-2644	RA: 16 13 49.5200 (243.4563333d) Dec: -26 44 32.60 (-26.74239d) Equinox: J2000		V=18.95	Reference Frame: ICRS
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]					

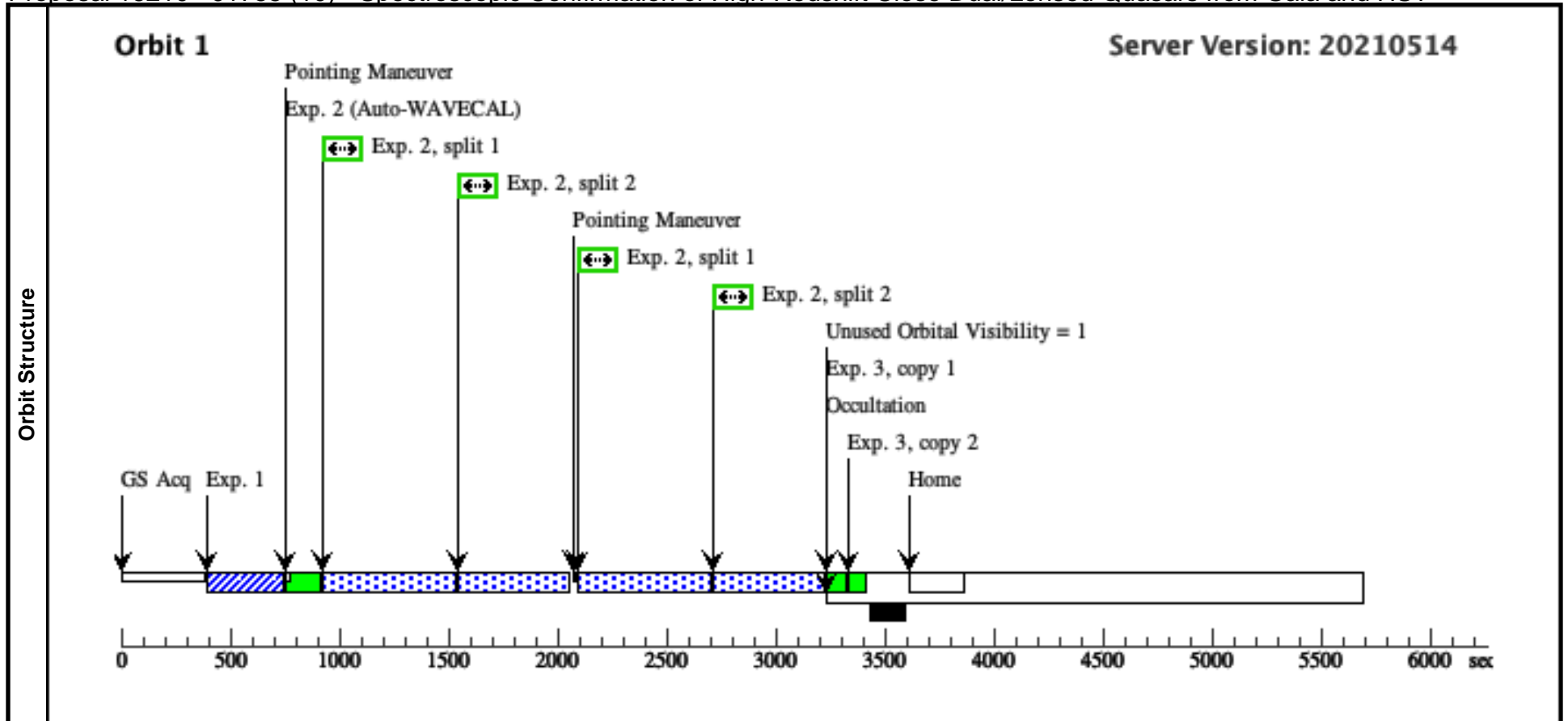
<b>Exposures</b>	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8953)	(9) J1613-2644	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs) [==>]	[1]
	2	J1613	(9) J1613-2644	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A	CR-SPLIT=2			2000 Secs (2144 Secs) [==>1072.0 Secs (Split 1)] [==>1072.0 Secs (Split 2)]	[1]
	3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]



Proposal 16210 - J1755 (10) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

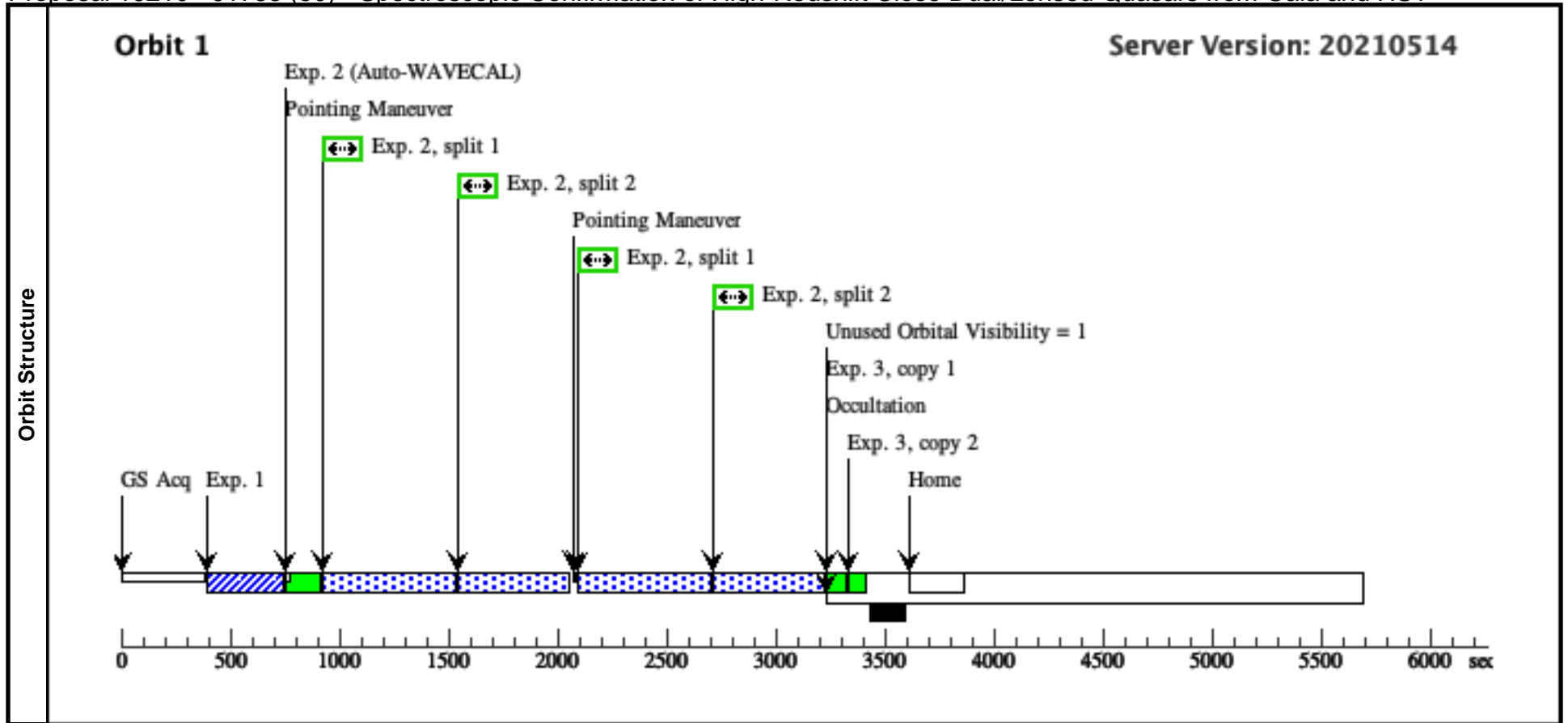
Visit	<b>Proposal 16210, J1755 (10), failed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 57.35D TO 57.35 D; ORIENT 237.35D TO 237.35 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=1.0	Center Pattern=false							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(10)	J1755+4229	RA: 17 55 43.1810 (268.9299208d) Dec: +42 29 24.25 (42.49007d) Equinox: J2000			V=17.74	Reference Frame: ICRS			
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8953)	(10) J1755+4229	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs) [==>]	[1]
	2	J1755	(10) J1755+4229	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in J1755 (10) (1)	2000 Secs (2102 Secs) [==>573.0 Secs (Pattern 1, Split 1)] [==>478.0 Secs (Pattern 1, Split 2)] [==>573.0 Secs (Pattern 2, Split 1)] [==>478.0 Secs (Pattern 2, Split 2)]	[1]
	3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]



Proposal 16210 - J1755 (50) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

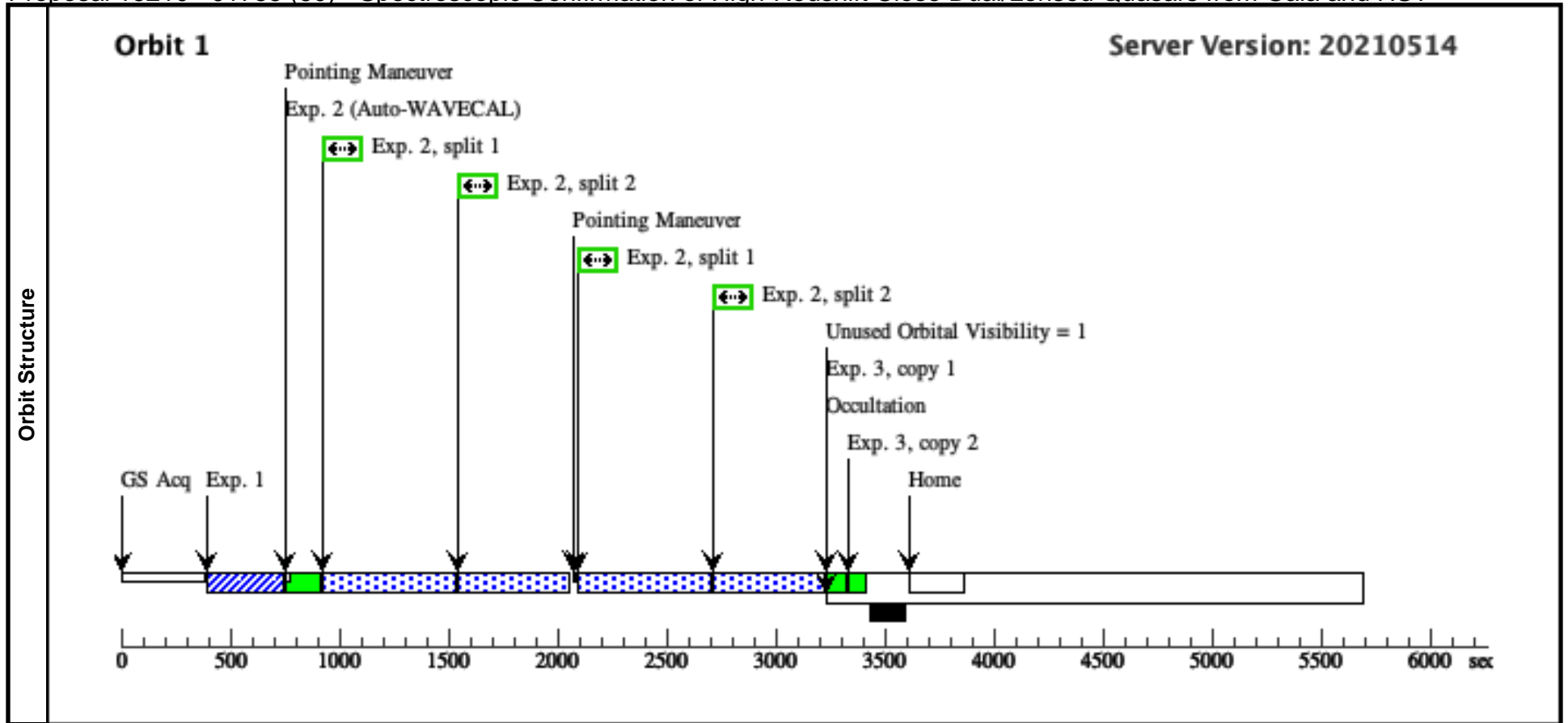
<b>Visit</b>	<b>Proposal 16210, J1755 (50), failed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 57.35D TO 57.35 D; ORIENT 237.35D TO 237.35 D <i>Comments: Automatic repeat of failed Visit 10.</i>									
	<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>				<b>Secondary Pattern</b>			<b>Exposures</b>
(1)		Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						(2)	
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=1.0	Center Pattern=false							
		Line Spacing=								
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>		<b>Targ. Coord. Corrections</b>		<b>Fluxes</b>	<b>Miscellaneous</b>		
	(10)	J1755+4229	RA: 17 55 43.1810 (268.9299208d)	Dec: +42 29 24.25 (42.49007d)			V=17.74	Reference Frame: ICRS		
			Equinox: J2000							
	<i>Comments: Category=GALAXY Description=[QSO, QUASAR]</i>									
<b>Exposures</b>	<b>#</b>	<b>Label (ETC Run)</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time (Total)/[Actual Dur.]</b>	<b>Orbit</b>
	1	acq (STIS.ta.144 8953)	(10) J1755+4229	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs)	
									[==>]	[1]
	2	J1755	(10) J1755+4229	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in J1755 (50) (1)	2000 Secs (2102 Secs)	
									[==>573.0 Secs (Pattern 1, Split 1)] [==>478.0 Secs (Pattern 1, Split 2)] [==>573.0 Secs (Pattern 2, Split 1)] [==>478.0 Secs (Pattern 2, Split 2)]	[1]
3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]	



Proposal 16210 - J1755 (60) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

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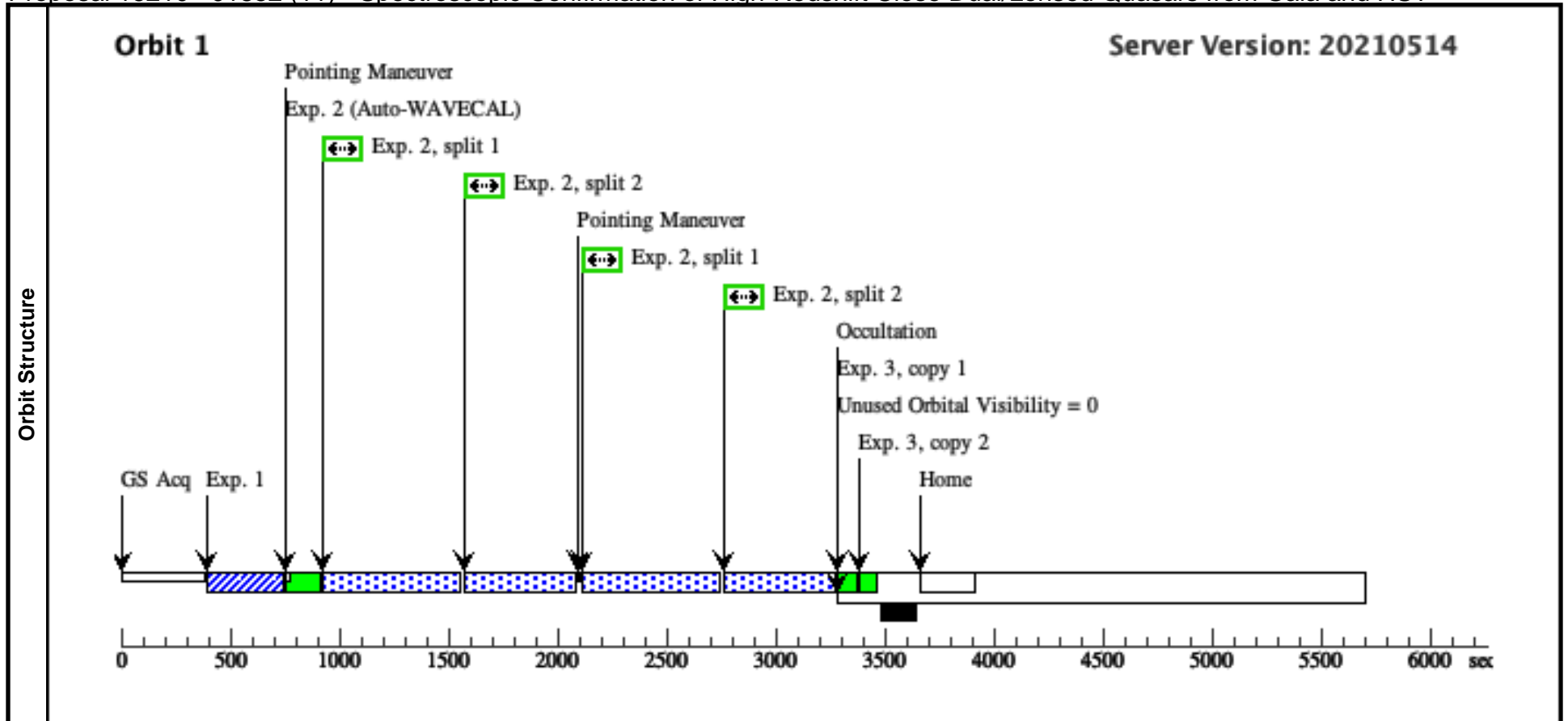
<b>Visit</b>	<b>Proposal 16210, J1755 (60), scheduling</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 57.35D TO 57.35 D; ORIENT 237.35D TO 237.35 D <i>Comments: Automatic repeat of failed Visit 50.</i>									
	<b>Patterns</b>	<b>#</b>	<b>Primary Pattern</b>				<b>Secondary Pattern</b>			<b>Exposures</b>
(1)		Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						(2)	
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=1.0	Center Pattern=false							
		Line Spacing=								
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>		<b>Targ. Coord. Corrections</b>		<b>Fluxes</b>	<b>Miscellaneous</b>		
	(10)	J1755+4229	RA: 17 55 43.1810 (268.9299208d)	Dec: +42 29 24.25 (42.49007d)	Equinox: J2000		V=17.74	Reference Frame: ICRS		
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]									
<b>Exposures</b>	<b>#</b>	<b>Label (ETC Run)</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time (Total)/[Actual Dur.]</b>	<b>Orbit</b>
	1	acq (STIS.ta.144 8953)	(10) J1755+4229	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs)	
									[==>]	[1]
	2	J1755	(10) J1755+4229	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in J1755 (60) (1)	2000 Secs (2102 Secs)	
									[==>573.0 Secs (Pattern 1, Split 1)] [==>478.0 Secs (Pattern 1, Split 2)] [==>573.0 Secs (Pattern 2, Split 1)] [==>478.0 Secs (Pattern 2, Split 2)]	[1]
3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]	



Proposal 16210 - J1852 (11) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

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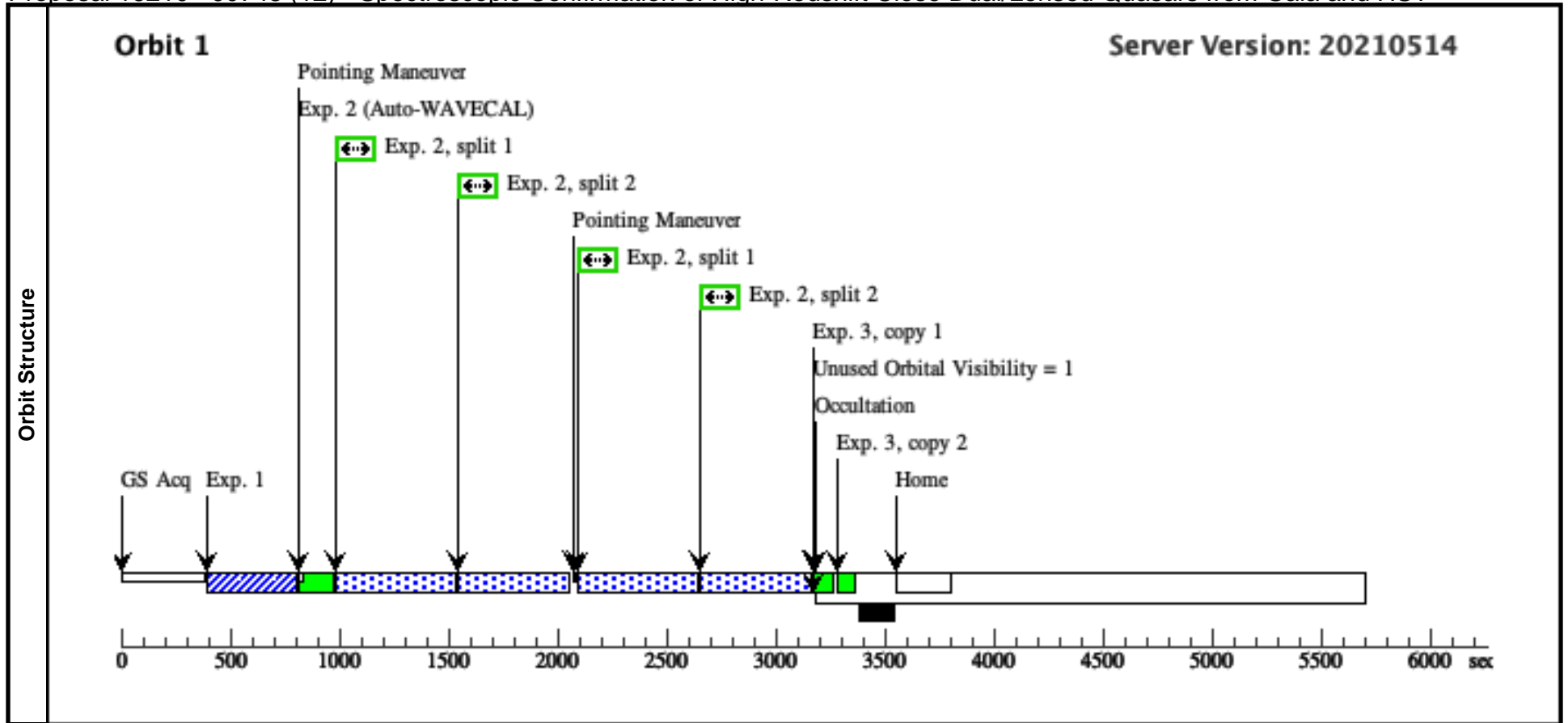
Visit	<b>Proposal 16210, J1852 (11), completed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 235.95D TO 235.95 D: ORIENT 55.95D TO 55.95 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						(2)
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=1.0	Center Pattern=false							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(11)	J1852+4833	RA: 18 52 26.1050 (283.1087708d) Dec: +48 33 15.02 (48.55417d) Equinox: J2000			V=19.15	Reference Frame: ICRS			
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8953)	(11) J1852+4833	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs)	
									[==>]	[1]
	2	J1852	(11) J1852+4833	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in J1852 (11) (1)	2000 Secs (2150 Secs)	
								[==>597.0 Secs (Pattern 1, Split 1)] [==>478.0 Secs (Pattern 1, Split 2)] [==>597.0 Secs (Pattern 2, Split 1)] [==>478.0 Secs (Pattern 2, Split 2)]	[1]	
3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]	



Proposal 16210 - J0748 (12) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

Visit	<b>Proposal 16210, J0748 (12), completed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: ORIENT 36.45D TO 36.45 D; ORIENT 216.45D TO 216.45 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=1.0	Center Pattern=false							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes	Miscellaneous		
	(12)	J0748+3146	RA: 07 48 0.5500 (117.0022917d)	Dec: +31 46 48.00 (31.78000d)			V=19.32	Reference Frame: ICRS		
		<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]								
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8953)	(12) J0748+3146	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			45 Secs (45 Secs)	
									[==>]	[1]
	2	J0748	(12) J0748+3146	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in J0748 (12) (1)	2000 Secs (1984 Secs)	
									[==>514.0 Secs (Pattern 1, Split 1)] [==>478.0 Secs (Pattern 1, Split 2)] [==>514.0 Secs (Pattern 2, Split 1)] [==>478.0 Secs (Pattern 2, Split 2)]	[1]
3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]	



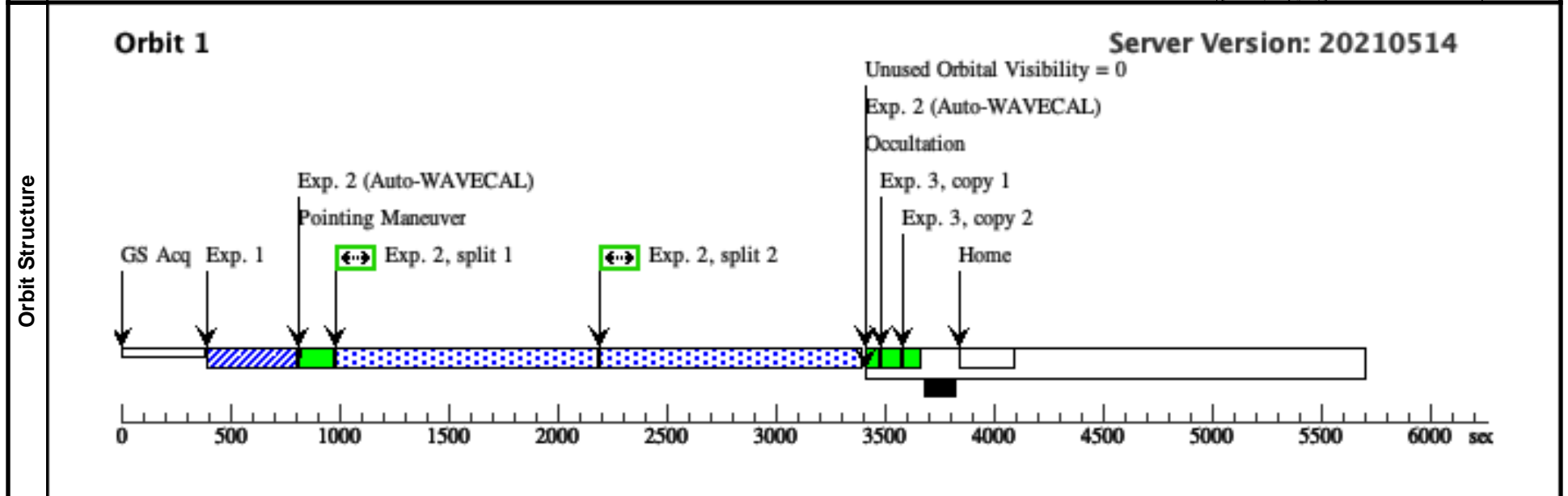
Proposal 16210 - J2048 (13) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

<b>Visit</b>	Proposal 16210, J2048 (13), completed				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: STIS/CCD				
	Special Requirements: ORIENT 342.45D TO 342.45 D: ORIENT 162.45D TO 162.45 D				

<b>Fixed Targets</b>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(13)	J2048+6258	RA: 20 48 48.0000 (312.2000000d) Dec: +62 58 58.30 (62.98286d) Equinox: J2000		V=19.54	Reference Frame: ICRS
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]					

<b>Exposures</b>	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8953)	(13) J2048+6258	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			45 Secs (45 Secs) [==>]	[1]
	2	J2048	(13) J2048+6258	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A	CR-SPLIT=2			2000 Secs (2330 Secs) [==>1165.0 Secs (Split 1)] [==>1165.0 Secs (Split 2)]	[1]
	3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]



Proposal 16210 - J2122 (14) - Spectroscopic Confirmation of High-Redshift Close Dual/Lensed Quasars from Gaia and HST

Wed Jan 12 17:00:28 GMT 2022

Visit	<b>Proposal 16210, J2122 (14), completed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: STIS/CCD Special Requirements: SCHED 100%; ORIENT 359.15D TO 359.15 D; ORIENT 179.15D TO 179.15 D									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=STIS-ALONG-SLIT	Coordinate Frame=POS-TARG						(2)
		Purpose=DITHER	Pattern Orientation=90.0							
		Number Of Points=2	Angle Between Sides=							
		Point Spacing=1.0	Center Pattern=false							
		Line Spacing=								
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(14)	J2122-0026	RA: 21 22 43.0100 (320.6792083d) Dec: -00 26 53.60 (-.44822d) Equinox: J2000			V=18.85	Reference Frame: ICRS			
	<i>Comments:</i> Category=GALAXY Description=[QSO, QUASAR]									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	acq (STIS.ta.144 8953)	(14) J2122-0026	STIS/CCD, ACQ, F28X50LP	MIRROR	ACQTYPE=POINT			30 Secs (30 Secs)	
									[==>]	[1]
	2	J2122	(14) J2122-0026	STIS/CCD, ACCUM, 52X0.2E1	G750L 7751 A	CR-SPLIT=2		Pattern 1, Exps 2-2 in J2122 (14) (1)	2000 Secs (1782 Secs)	
								[==>413.0 Secs (Pattern 1, Split 1)] [==>478.0 Secs (Pattern 1, Split 2)] [==>413.0 Secs (Pattern 2, Split 1)] [==>478.0 Secs (Pattern 2, Split 2)]	[1]	
3	ccdflat	CCDFLAT	STIS/CCD, ACCUM, 52X0.2	G750L 7751 A				[==>(Copy 1)] [==>(Copy 2)]	[1]	

