



15247 - Low redshift Lyman-alpha blobs

Cycle: 25, Proposal Category: GO

(UV Initiative)

(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) GAL-134709+545310	ACS/SBC	2	03-Jul-2017 21:01:00.0	yes
02	(2) GAL-145533+044643	ACS/SBC	2	03-Jul-2017 21:01:02.0	yes
03	(3) GAL-150517+194444	ACS/SBC	2	03-Jul-2017 21:01:03.0	yes

6 Total Orbits Used

ABSTRACT

Lyman-alpha blobs (LABs) are luminous nebula at redshifts of 2 and beyond. Their nature and ionization sources have remained mysterious. The lack of accessible diagnostic emission lines and the poorly understood Lyman-alpha escape mechanism have so far prevented a consistent physical picture of LABs. We suggest that many LABs harbor transient AGN that have recently and quickly faded from our view; the Ly-alpha photons from the earlier quasar phase, however, are resonantly scattered and slowly released over times much longer than the LABs' light crossing time. These ionization echoes naturally explain the severe power deficits observed in LABs. We have identified a rare population of ultra-luminous [OIII] ionization echoes around transient AGN at redshifts $z=0.3$. They share many characteristics of LABs, including high Lyman-alpha luminosities of up to $7e43$ erg/s as suggested by GALEX FUV images. We ask to observe three targets to verify the strong Lyman-alpha emission using ACS/SBC. This would prove that LABs may still exist in the Universe 7 billion years later than most other LABs known. It would also show that fading AGN explain the power deficits of many LABs, solving a puzzle that has been standing for nearly two decades. In combination with our existing ground-based imaging and 3D spectroscopy, and soft-and hard X-ray data, we will exploit the HST far-UV data to also study the Lyman-alpha escape mechanism. This proposal is a continuation of our cycle 24 allocation, to complete the far-UV data for the most luminous LABs in our sample. This proposal exploits the unique far-UV capabilities of HST.

OBSERVING DESCRIPTION

This program aims to obtain far-UV spectra and images with ACS/SBC, for a total of three targets. The targets are galaxies at redshift 0.3, embedded in luminous clouds of ionized gas. The clouds have diameters between 10-25 arcseconds, and we want to determine their Lyman-alpha properties.

Each target has one visit, consisting of two orbits.

In the first orbit, we take a slitless spectrum of the source, followed by an image in the second orbit.

The science exposures (spectrum and image) are split into two sub-exposures of approximately equal length (1300s), using a line dither pattern to reject detector defects.

The purpose of the spectrum (first orbit) is to determine the total amount of flux in the Lyman-alpha line, and to measure the flux in the continuum (if any).

The purpose of the image (second orbit) is to obtain a deeper view to determine morphology and size. The image is also needed to reduce the slitless

Proposal 15247 (STScI Edit Number: 0, Created: Monday, July 3, 2017 8:01:04 PM EST) - Overview
spectrum.

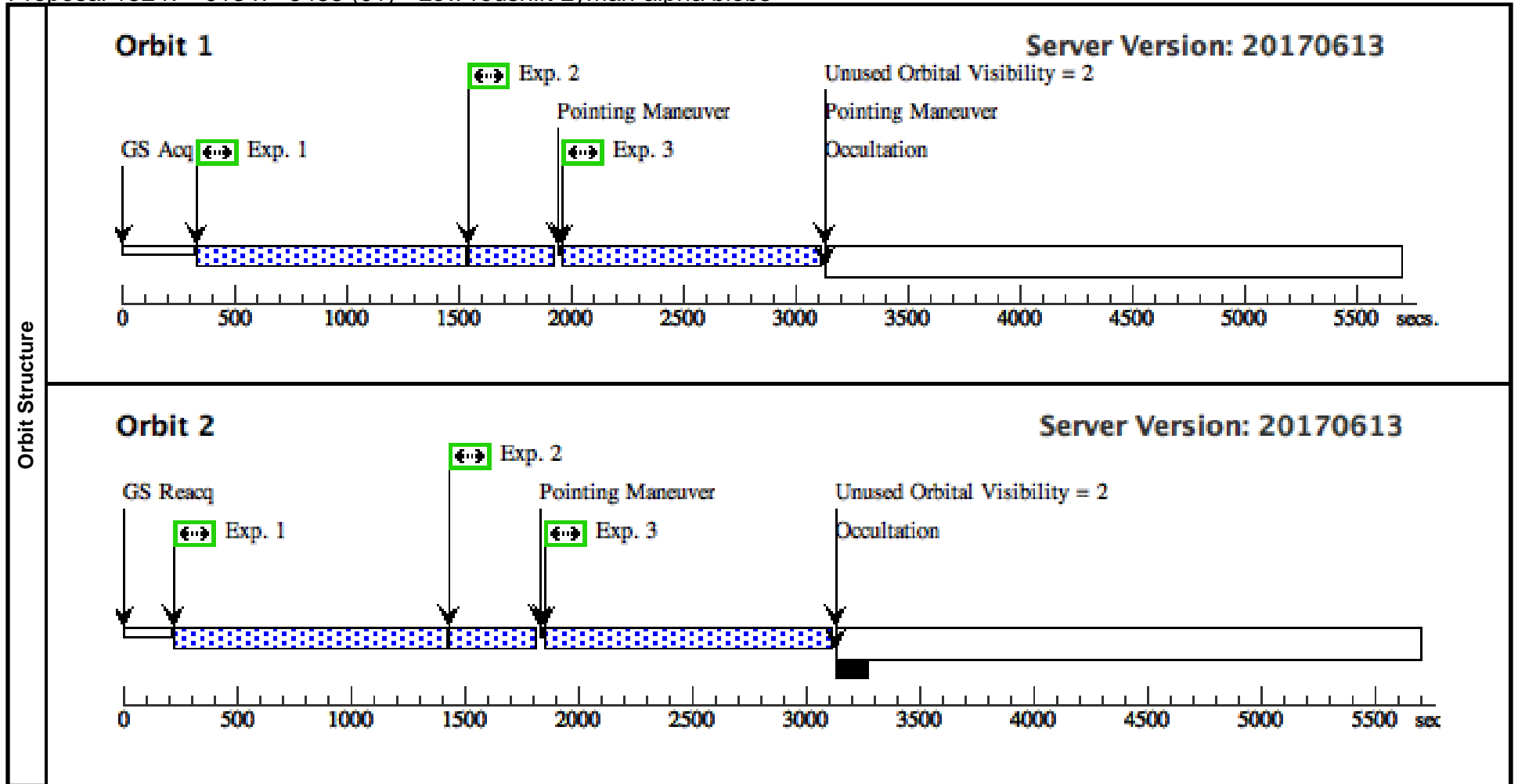
Absolute flux calibration is important. This will mainly be based on the slitless spectrum, where we can isolate the effects of the red leaks.

All our targets are covered by GALEX imaging, no FUV-bright stars are in the field of view.

Proposal 15247 - J1347+5453 (01) - Low redshift Lyman-alpha blobs

Tue Jul 04 01:01:04 GMT 2017

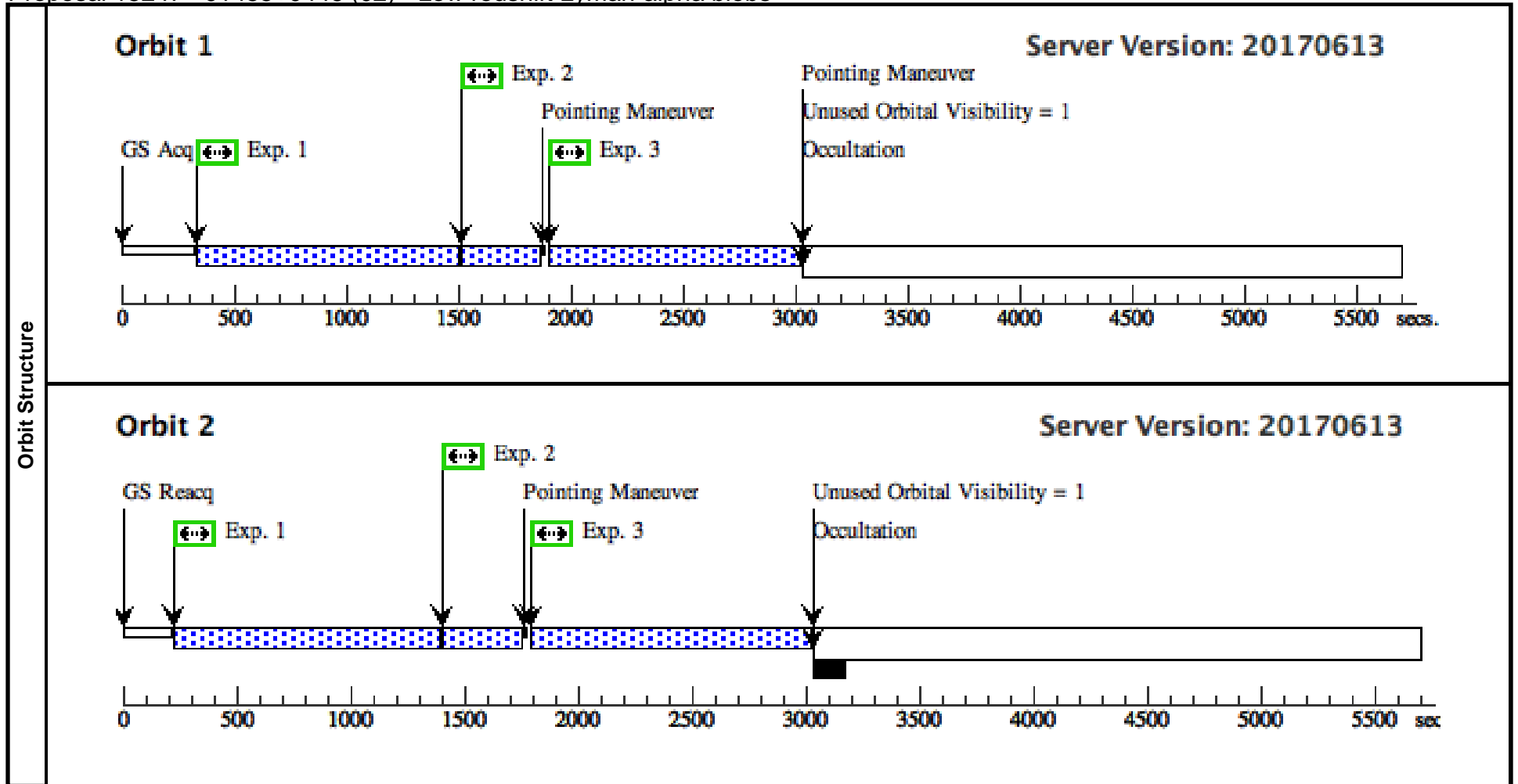
Visit	Proposal 15247, J1347+5453 (01) Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: SCHED 80%; ORIENT 70D TO 185 D; ORIENT 250D TO 5 D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-SBC-DITHER- LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.472 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=44.4 Angle Between Sides= Center Pattern=false		(1-3)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	GAL-134709+545310 Alt Name1: J1347-5453	RA: 13 47 9.1260 (206.7880250d) Dec: +54 53 10.93 (54.88637d) Equinox: J2000	Redshift: 0.332	V=19.8+/-0.1 r=18.7, GALEX FUV=31.0 microjansky integrated over the entire source	Reference Frame: ICRS				
	<i>Comments: Source diameter: 5x9 arcsec Extended=YES</i>									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	J1347+5453 image (939185)	(1) GAL-134709+54 5310	ACS/SBC, ACCUM, SBC	F140LP			Pattern 1, Exps 1-3 in J1347+5453 (01) (1)	1100 Secs (2264 Secs) [==>1132.0 Secs (Pattern 1)] [==>1132.0 Secs (Pattern 2)]	[1] [2]
	<i>Comments: Single image</i>									
	2	J1347+5453 image (939696)	(1) GAL-134709+54 5310	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1, Exps 1-3 in J1347+5453 (01) (1)	300 Secs (664 Secs) [==>332.0 Secs (Pattern 1)] [==>332.0 Secs (Pattern 2)]	[1] [2]
	<i>Comments: Single image</i>									
	3	J1347+5453 slitless spectrum (939165)	(1) GAL-134709+54 5310	ACS/SBC, ACCUM, SBC	PR130L			Pattern 1, Exps 1-3 in J1347+5453 (01) (1)	1000 Secs (2303 Secs) [==>1096.0 Secs (Pattern 1)] [==>1207.0 Secs (Pattern 2)]	[1] [2]
	<i>Comments: Slitless spectroscopic image</i>									



Proposal 15247 - J1455+0446 (02) - Low redshift Lyman-alpha blobs

Tue Jul 04 01:01:04 GMT 2017

Visit	Proposal 15247, J1455+0446 (02) Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: SCHED 80%; ORIENT 10D TO 50 D; ORIENT 190D TO 230 D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=ACS-SBC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.472 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=44.4 Angle Between Sides= Center Pattern=false		(1-3)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	GAL-145533+044643 Alt Name1: J1455+0446	RA: 14 55 33.6870 (223.8903625d) Dec: +04 46 43.21 (4.77867d) Equinox: J2000	Redshift: 0.334	V=19.5+/-0.1 r=18.5, GALEX FUV=19.8 microjansky integrated over the entire source	Reference Frame: ICRS				
	<i>Comments: Source diameter: 6x9 arcsec Extended=YES</i>									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	J1455+0446 image (939189)	(2) GAL-145533+04 4643	ACS/SBC, ACCUM, SBC	F140LP			Pattern 1, Exps 1-3 in J1455+0446 (02) (1)	1100 Secs (2198 Secs)	
									[==>1099.0 Secs (Pattern 1)]	[1]
									[==>1099.0 Secs (Pattern 2)]	[2]
	<i>Comments: Single image</i>									
2	J1455+0446 image (939689)	(2) GAL-145533+04 4643	ACS/SBC, ACCUM, SBC	F165LP				Pattern 1, Exps 1-3 in J1455+0446 (02) (1)	300 Secs (598 Secs)	
									[==>299.0 Secs (Pattern 1)]	[1]
									[==>299.0 Secs (Pattern 2)]	[2]
	<i>Comments: Single image</i>									
3	J1455+0446 slitless spectrum (939166)	(2) GAL-145533+04 4643	ACS/SBC, ACCUM, SBC	PR130L				Pattern 1, Exps 1-3 in J1455+0446 (02) (1)	1100 Secs (2237 Secs)	
									[==>1063.0 Secs (Pattern 1)]	[1]
									[==>1174.0 Secs (Pattern 2)]	[2]
	<i>Comments: Slitless spectroscopic image</i>									



Proposal 15247 - J1505+1944 (03) - Low redshift Lyman-alpha blobs

Tue Jul 04 01:01:04 GMT 2017

Visit	Proposal 15247, J1505+1944 (03) Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: SCHED 80%; ORIENT 30D TO 100 D; ORIENT 210D TO 280 D										
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures		
		(1)	Pattern Type=ACS-SBC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.472 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=44.4 Angle Between Sides= Center Pattern=false					(1-3)		
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(3)	GAL-150517+194444 Alt Name1: J1505+1944	RA: 15 05 17.6300 (226.3234583d) Dec: +19 44 44.83 (19.74579d) Equinox: J2000		Redshift: 0.341		V=19.2+/-0.1 r=17.9, GALEX FUV=22.7 microjansky integrated over the entire source	Reference Frame: ICRS			
	<i>Comments: Source diameter: 7x7 arcsec</i> <i>Extended=YES</i>										
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1	J1505+1944 image (939266)	(3) GAL-150517+19444	ACS/SBC, ACCUM, SBC	F140LP				Pattern 1, Exps 1-3 in J1505+1944 (03) (1)	1100 Secs (2206 Secs) [=>1103.0 Secs (Pattern 1)] [=>1103.0 Secs (Pattern 2)]	[1] [2]
	<i>Comments: Single image</i>										
2	J1505+1944 image (939681)	(3) GAL-150517+19444	ACS/SBC, ACCUM, SBC	F165LP				Pattern 1, Exps 1-3 in J1505+1944 (03) (1)	300 Secs (606 Secs) [=>303.0 Secs (Pattern 1)] [=>303.0 Secs (Pattern 2)]	[1] [2]	
	<i>Comments: Single image</i>										
3	J1505+1944 slitless spectrum (939170)	(3) GAL-150517+19444	ACS/SBC, ACCUM, SBC	PR130L				Pattern 1, Exps 1-3 in J1505+1944 (03) (1)	1100 Secs (2243 Secs) [=>1066.0 Secs (Pattern 1)] [=>1177.0 Secs (Pattern 2)]	[1] [2]	
	<i>Comments: Slitless spectroscopic image</i>										

