14749 - Low redshift Lyman-alpha blobs

Cycle: 24, Proposal Category: GO

(UV Initiative)

(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) GAL-011341+010608	ACS/SBC	2	14-Aug-2017 14:00:22.0	yes
02	(2) GAL-115544-014740	ACS/SBC	2	14-Aug-2017 14:00:23.0	yes
03	(3) GAL-224024-092748	ACS/SBC	2	14-Aug-2017 14:00:24.0	yes
52	(2) GAL-115544-014740	ACS/SBC	2	14-Aug-2017 14:00:25.0	yes

8 Total Orbits Used

ABSTRACT

Lyman-alpha blobs (LABs) are luminous nebula at redshifts of 2 and beyond. Their nature and ionization sources are 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 over a decade. 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. Ihe image is also needed to reduce the slitless 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.

Visit

Proposal 14749, J0113+0106 (01), scheduled Mon Aug 14 18:00:25 GMT 2017

Diagnostic Status: Warning

Scientific Instruments: ACS/SBC

Special Requirements: SCHED 80%

Diagnostics

(J0113+0106 (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(J0113+0106 (01)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

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

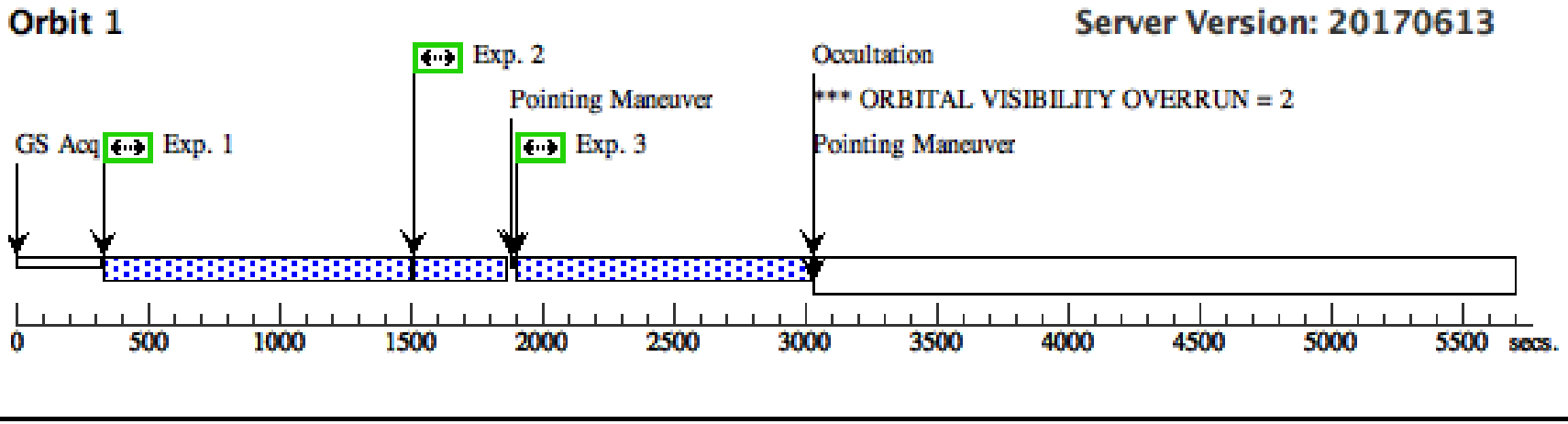
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	GAL-011341+010608 Alt Name1: J0113+0106	RA: 01 13 41.1100 (18.4212917d) Dec: +01 06 8.50 (1.10236d) Equinox: J2000	Redshift: 0.281	V=19.8+/-0.1 r=18.5, GALEX FUV=15.9 microjansky integrated over the entire source	Reference Frame: ICRS

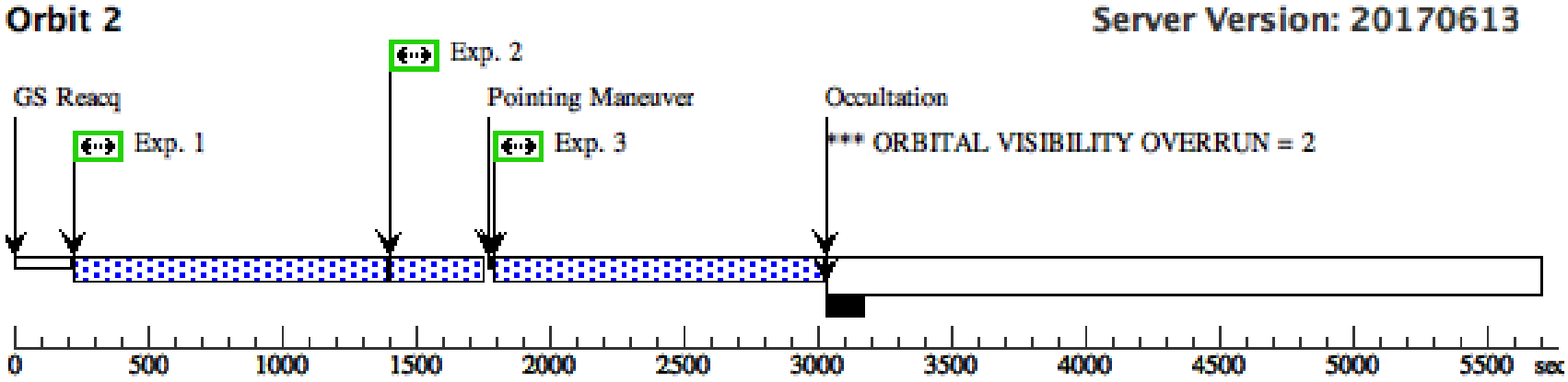
Comments: Source diameter: 5x15 arcsec
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	J0113+0106 image (800642)	(1) GAL-011341+010608	ACS/SBC, ACCUM, SBC	F140LP			Pattern 1, Exps 1-3 in J0113+0106 (01) (1)	1100 Secs (2200 Secs)	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	***[2]***
Comments: Single image									
2	J0113+0106 image (800642)	(1) GAL-011341+010608	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1, Exps 1-3 in J0113+0106 (01) (1)	300 Secs (600 Secs)	
								[==>300.0 Secs (Pattern 1)]	***[1]***
								[==>300.0 Secs (Pattern 2)]	***[2]***
Comments: Single image									
3	J0113+0106 slitless spectrum (800611)	(1) GAL-011341+010608	ACS/SBC, ACCUM, SBC	PR130L			Pattern 1, Exps 1-3 in J0113+0106 (01) (1)	1000 Secs (2239 Secs)	
								[==>1064.0 Secs (Pattern 1)]	***[1]***
								[==>1175.0 Secs (Pattern 2)]	***[2]***
Comments: Slitless spectroscopic image									

Orbit Structure





Visit

Proposal 14749, J1155-0147 (02), failed Mon Aug 14 18:00:26 GMT 2017

Diagnostic Status: Warning

Scientific Instruments: ACS/SBC

Special Requirements: SCHED 80%

Comments: Target coordinates include a small offset with respect to the nucleus of galaxy to better accomodate the extended flux.

Diagnostics

(J1155-0147 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(J1155-0147 (02)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

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

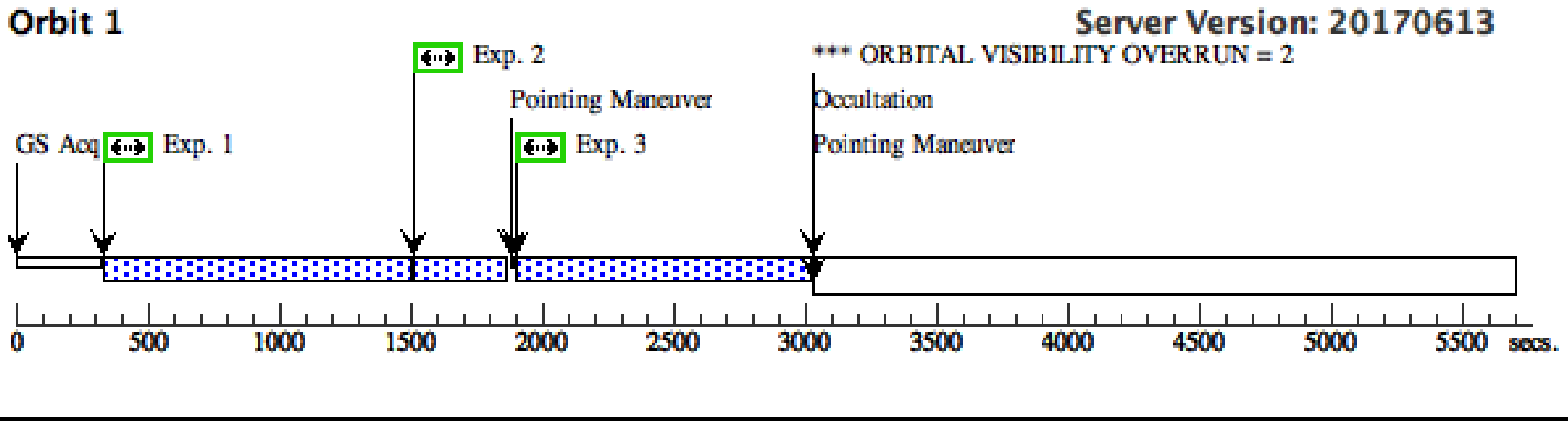
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(2)	GAL-115544-014740 Alt Name1: J1155-0147	RA: 11 55 44.5867 (178.9357779d) Dec: -01 47 41.76 (-1.79493d) Equinox: J2000	Redshift: 0.306	V=18.5+/-0.1 r=17.9, GALEX FUV=40.8 microjansky integrated over the entire source	Reference Frame: ICRS

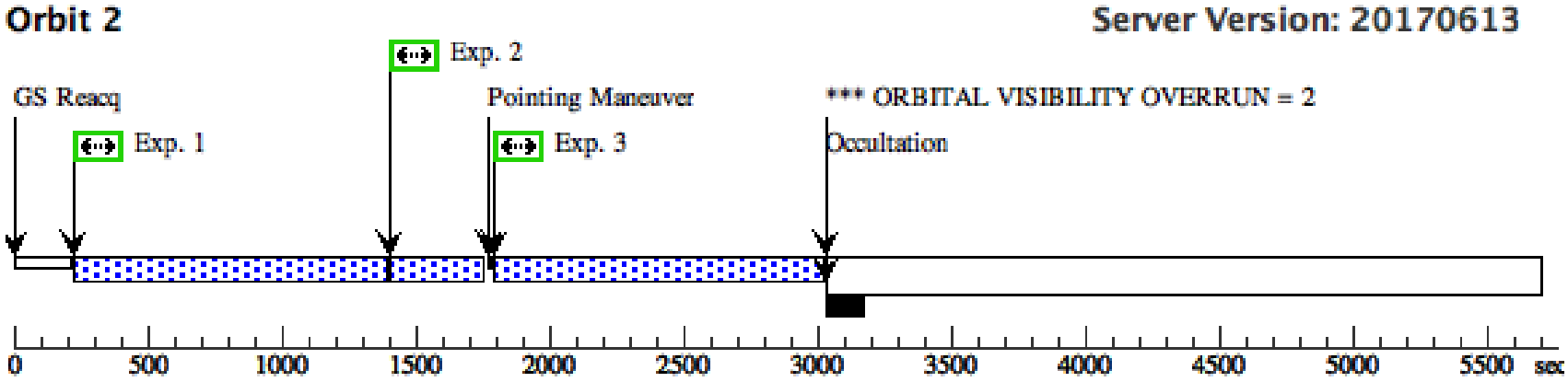
Comments: Source diameter: 20x25 arcsec
A small offset in DEC has been introduced with respect to the nucleus of the galaxy. This is to better accomodate the extended nebulosity in the SBC field of view. The offset is noticable in the target confirmation chart.
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	J1155-0147 image (800647)	(2) GAL-115544-014740	ACS/SBC, ACCUM, SBC	F140LP			Pattern 1, Exps 1-3 in J1155-0147 (02) (1)	1100 Secs (2200 Secs)	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	***[2]***
	Comments: Single image								
2	J1155-0147 image (800647)	(2) GAL-115544-014740	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1, Exps 1-3 in J1155-0147 (02) (1)	300 Secs (600 Secs)	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	***[2]***
	Comments: Single image								
3	J1155-0147 slitless spectrum (800619)	(2) GAL-115544-014740	ACS/SBC, ACCUM, SBC	PR130L			Pattern 1, Exps 1-3 in J1155-0147 (02) (1)	1100 Secs (2239 Secs)	
								[==>1064.0 Secs (Pattern 1)]	***[1]***
								[==>1175.0 Secs (Pattern 2)]	***[2]***
	Comments: Slitless spectroscopic image								

Orbit Structure





Visit

Proposal 14749, J2240-0927 (03), scheduling Mon Aug 14 18:00:26 GMT 2017

Diagnostic Status: No Diagnostics

Scientific Instruments: ACS/SBC

Special Requirements: SCHED 80%

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

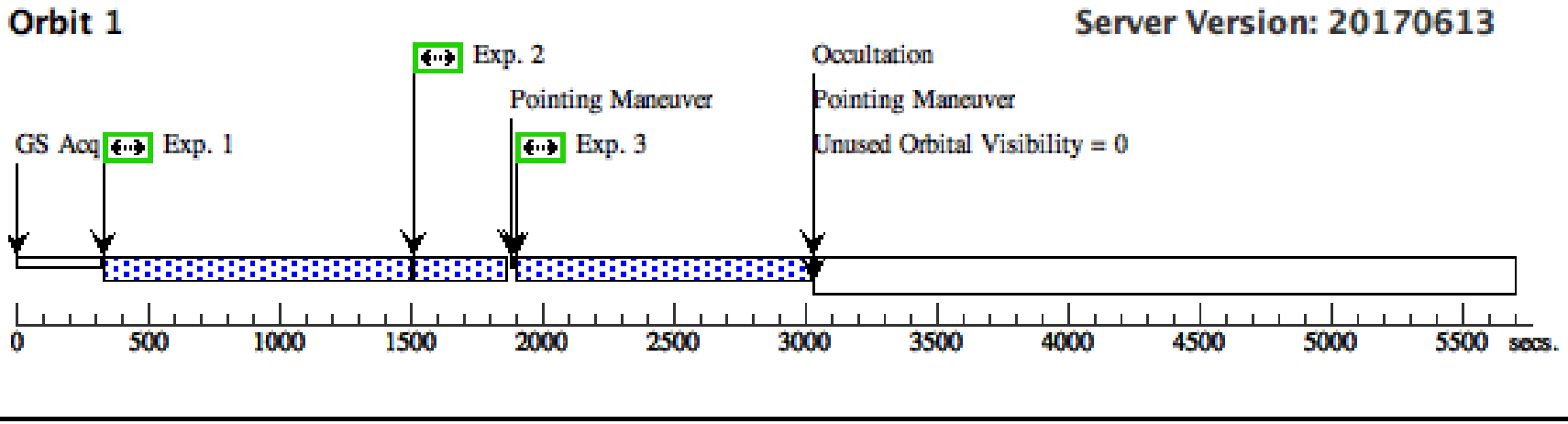
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(3)	GAL-224024-092748 Alt Name1: J2240-0927	RA: 22 40 24.1100 (340.1004583d) Dec: -09 27 48.10 (-9.46336d) Equinox: J2000	Redshift: 0.326	V=19.4+/-0.1 r=18.3, GALEX FUV=21.2 microjansky integrated over the entire source	Reference Frame: ICRS

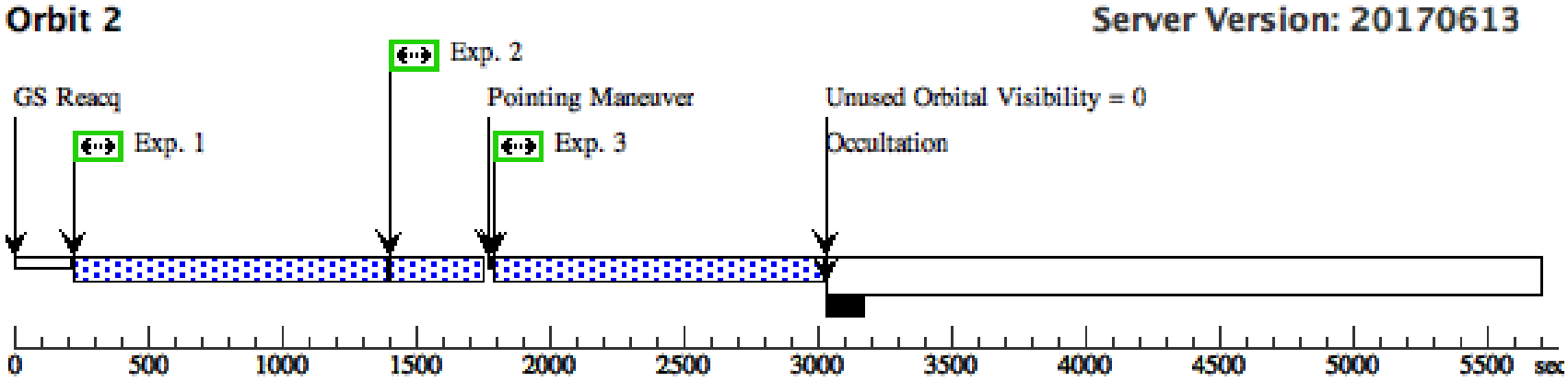
Comments: Source diameter: 6x8 arcsec
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	J2240-0927 image (800656)	(3) GAL-224024-092748	ACS/SBC, ACCUM, SBC	F140LP			Pattern 1, Exps 1-3 in J2240-0927 (03) (1)	1100 Secs (2200 Secs)	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	***[2]***
	Comments: Single image								
2	J2240-0927 image (800656)	(3) GAL-224024-092748	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1, Exps 1-3 in J2240-0927 (03) (1)	300 Secs (600 Secs)	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	***[2]***
	Comments: Single image								
3	J2240-0927 slitless spectrum (800629)	(3) GAL-224024-092748	ACS/SBC, ACCUM, SBC	PR130L			Pattern 1, Exps 1-3 in J2240-0927 (03) (1)	1100 Secs (2237 Secs)	
								[==>1063.0 Secs (Pattern 1)]	***[1]***
								[==>1174.0 Secs (Pattern 2)]	***[2]***
	Comments: Slitless spectroscopic image								

Orbit Structure





Visit

Proposal 14749, J1155-0147 (52) Mon Aug 14 18:00:26 GMT 2017

Diagnostic Status: Warning

Scientific Instruments: ACS/SBC

Special Requirements: SCHED 80%

Comments: Target coordinates include a small offset with respect to the nucleus of galaxy to better accomodate the extended flux.

Diagnostics

(J1155-0147 (52)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

(J1155-0147 (52)) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN

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-115544-014740 Alt Name1: J1155-0147	RA: 11 55 44.5867 (178.9357779d) Dec: -01 47 41.76 (-1.79493d) Equinox: J2000	Redshift: 0.306	V=18.5+/-0.1 r=17.9, GALEX FUV=40.8 microjansky integrated over the entire source	Reference Frame: ICRS

Comments: Source diameter: 20x25 arcsec
A small offset in DEC has been introduced with respect to the nucleus of the galaxy. This is to better accomodate the extended nebulosity in the SBC field of view. The offset is noticable in the target confirmation chart.
Extended=YES

Exposures

#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	J1155-0147 image (800647)	(2) GAL-115544-014740	ACS/SBC, ACCUM, SBC	F140LP			Pattern 1, Exps 1-3 in J1155-0147 (52) (1)	1100 Secs (2200 Secs)	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	***[2]***
	Comments: Single image								
2	J1155-0147 image (800647)	(2) GAL-115544-014740	ACS/SBC, ACCUM, SBC	F165LP			Pattern 1, Exps 1-3 in J1155-0147 (52) (1)	300 Secs (600 Secs)	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	***[2]***
	Comments: Single image								
3	J1155-0147 slitless spectrum (800619)	(2) GAL-115544-014740	ACS/SBC, ACCUM, SBC	PR130L			Pattern 1, Exps 1-3 in J1155-0147 (52) (1)	1100 Secs (2239 Secs)	
								[==>1064.0 Secs (Pattern 1)]	***[1]***
								[==>1175.0 Secs (Pattern 2)]	***[2]***
	Comments: Slitless spectroscopic image								

Orbit Structure