



14694 - SDSSCGB-46589.1 -- a Lyman Alpha Blob at Low Redshift?

Cycle: 24, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Prof. Stephan Robert McCandliss (PI) (Contact)	The Johns Hopkins University	stephan@pha.jhu.edu
Prof. Claudia Scarlata (CoI)	University of Minnesota - Twin Cities	scarlata@astro.umn.edu
Dr. Colin A. Norman (CoI)	The Johns Hopkins University	norman@stsci.edu
Keith Redwine (CoI)	The Johns Hopkins University	kredwine@pha.jhu.edu
Dr. Timothy M. Heckman (CoI)	The Johns Hopkins University	heckman@pha.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) SDSSCGB-46589.1	ACS/SBC	1	29-Jul-2016 14:53:46.0	yes
02	(1) SDSSCGB-46589.1	ACS/SBC	1	29-Jul-2016 14:53:47.0	yes
03	(1) SDSSCGB-46589.1	ACS/SBC	1	29-Jul-2016 14:53:48.0	yes
04	(1) SDSSCGB-46589.1	ACS/SBC	1	29-Jul-2016 14:53:48.0	yes
05	(1) SDSSCGB-46589.1	ACS/SBC	1	29-Jul-2016 14:53:49.0	yes

5 Total Orbits Used

ABSTRACT

We seek to determine whether SDSSCGB-46589.1 may be a Lyman alpha blob at a redshift of $z = 0.273$ or an extended UV disk galaxy. Lyman alpha blobs are typically found in abundance at redshift around 2 - 3, in strongly clustered environments. They are curious markers of large scale

structure, devoid of continuum emission, with luminosities $L(\text{Ly}\alpha) \sim 1e44$ erg/s, and linear dimensions ~ 100 kpc. The exact mechanism(s) for excitation have not been conclusively identified, but several have been proposed, including excitation from cold accretion streams, resonance scattering from nearby sources, supernovae or stellar driven outflows, etc. They are anticipated to be rare at low redshift, with the nearest one ever found residing at $z=1$. If confirmed by the observations proposed here, then this would be the lowest redshift Lyman alpha blob ever found. It would then offer the opportunity to fully examine its location within the cluster environment, wherein high spatial and spectral resolution observations could be brought-to-bear, with the ultimate goal of determining the excitation mechanism for these enigmatic objects. Our preliminary goal for this proposal is to search for embedded continuum emitting sources, and to confirm or deny the Lyman alpha blob or extended UV disk nature of this object through the use of far-UV imaging and slitless spectroscopy.

OBSERVING DESCRIPTION

The object in question (SDSSCGB-46589.1) is suspected of being an example of a "Lyman alpha blob" at low redshift.

Our goal is to search for embedded continuum emitting sources and to confirm or deny the Lyman alpha blob or extended UV (XUV) disk nature of this object. In the Phase I proposal we showed how the FUV emission is approximately twice the angular extent of the visual continuum emissions. If the FUV emission is dominated by Lyman alpha emission then it should manifest as a strong signal covering a large angular extent in one of the differenced longpass filter images as discussed below. There should be little corresponding continuum emission. If the FUV emission is dominated by an XUV disk then the signal will be more or less the same in all the differenced images.

The redshift of this object is such that Lyman alpha appears at a wavelength in between the ACS/SBC longpass filters F150LP and the F165LP. We will use the difference of the images F150LP - F165LP to isolate Lyman alpha, along with F140LP - F150LP and F165LP alone to constrain the surrounding continuum flux. We note that O VI 1032, 1036 appears in the F125LP - F140LP differential band and the possibility exists to obtain an image of this elusive line. We will complement the differential photometry with the PR130L prism data to produce a slitless spectrum of this object, which will provide ground truth for the SED assumptions that must be made when relying on broad band subtractions to infer the presence of emission line features. It will provide a peek, albeit spectrally confused, at the true SED. Any red leak pileup in the prism is expected to be of narrower angular extent than the FUV emissions regardless of their being Lyman alpha or XUV continuum emission from a disk.

This program will use ACS/SBC for 5 orbits. Four orbits will be devoted to long pass filter observations. In each orbit 4 images will be acquired from 4 filters in the order of F165LP, F125LP, F140LP and F150LP. We require the F125LP, F140LP observations to be acquired in shadow to

Proposal 14694 (STScI Edit Number: 0, Created: Friday, July 29, 2016 1:53:49 PM EST) - Overview

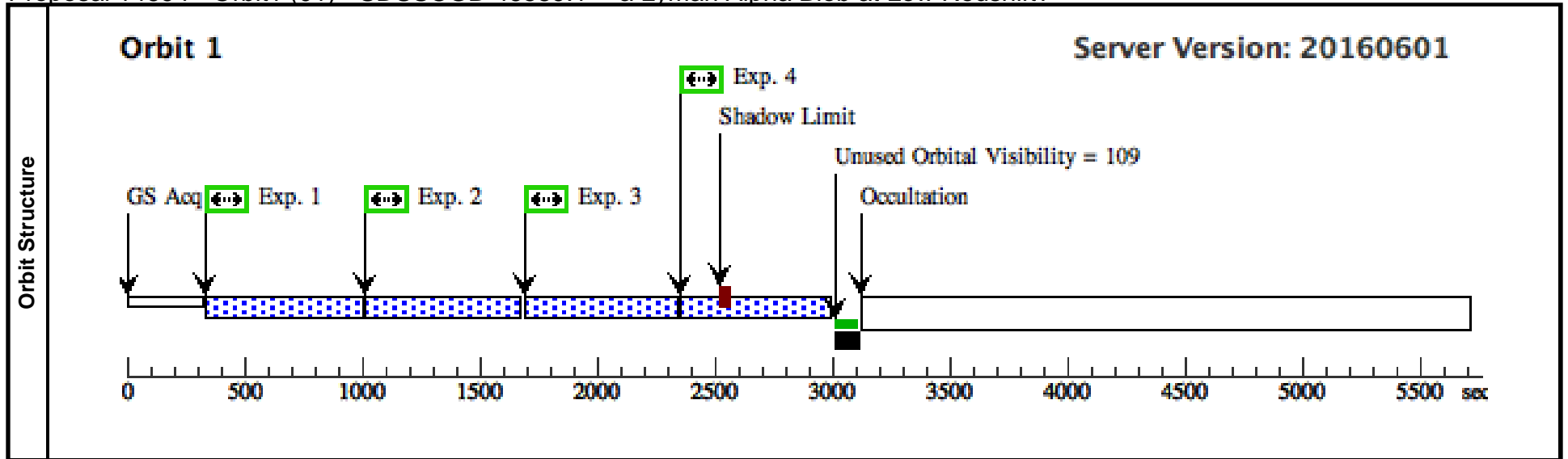
mitigate elevation of the background by geo-coronal emissions. The F165LP and F150LP do not require shadow and have been placed before and after, respectively, the back-to-back F125LP and F140LP exposures. The observing time is split evenly between the 4 filters. We arrived at an on target observing time of 600 seconds to improve observability. The position of the 2nd, 3rd and 4th orbits are offset from each other in the y direction by 0.3 arcseconds. The final orbit is PR130L, which we have elected to acquire in four different exposures each with length equal to 620 seconds, so as to acquire at least two exposures in the shadow zone to mitigate the effects of geo-coronal contamination. The prism observations will be acquired in two locations, with the first two at 0.0 and the second two offset in the y direction by 0.3 arcseconds. In all 20 individual ACS SBC frames will be acquired.

It is our understanding that nominally ACS/SBC observations are acquired outside of the SAA. However, in a previous program we noticed elevated backgrounds on observations acquired when Hubble was skimming the SAA Contour. Consequently, we would like all observations to be acquired as far from the SAA as possible.

Proposal 14694 - Orbit1 (01) - SDSSCGB-46589.1 -- a Lyman Alpha Blob at Low Redshift?

Fri Jul 29 18:53:49 GMT 2016

Visit	Proposal 14694, Orbit1 (01) Diagnostic Status: No Diagnostics Scientific Instruments: ACS/SBC Special Requirements: SCHED 60%									
	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
Fixed Targets	(1)	SDSSCGB-46589.1	RA: 14 03 18.1820 (210.8257583d) Dec: +15 13 55.93 (15.23220d) Equinox: J2000		V=17.9+/-0.05 (fuv, nuv, u, g, r, i, z) = (5.8, 2.6, 1.5, 2.5, 2.2, 1.7, 1.4)*1e-16 ergs cm^-2 s^-1 Ang ^-1	Reference Frame: SIMBAD				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. 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	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F165LP		POS TARG 0,0		625 Secs (600 Secs) [=>600.0 Secs]	[1]
	2	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F125LP		SAME POS AS 1; SHADOW		625 Secs (600 Secs) [=>600.0 Secs]	[1]
	3	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F140LP		SAME POS AS 1; SHADOW		625 Secs (600 Secs) [=>600.0 Secs]	[1]
	4	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F150LP		SAME POS AS 1		625 Secs (600 Secs) [=>600.0 Secs]	[1]



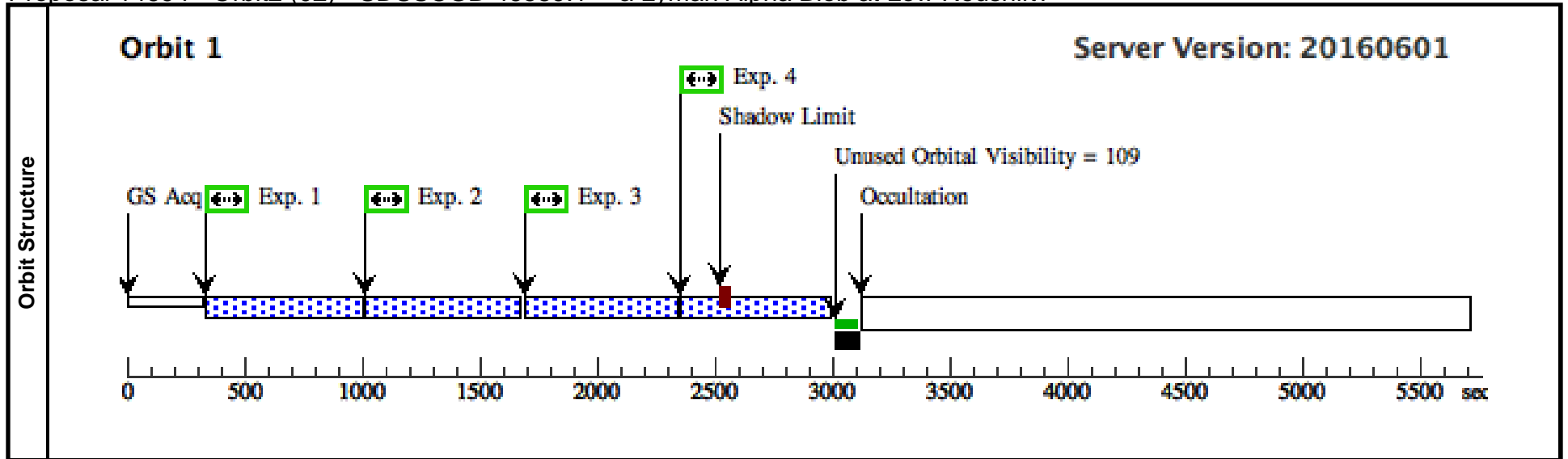
Proposal 14694 - Orbit2 (02) - SDSSCGB-46589.1 -- a Lyman Alpha Blob at Low Redshift?

Fri Jul 29 18:53:50 GMT 2016

Visit	Proposal 14694, Orbit2 (02)				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: ACS/SBC				
	Special Requirements: SCHED 60%				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	SDSSCGB-46589.1	RA: 14 03 18.1820 (210.8257583d) Dec: +15 13 55.93 (15.23220d) Equinox: J2000		V=17.9+/-0.05 (fuv, nuv, u, g, r, i, z) = (5.8, 2.6, 1.5, 2.5, 2.2, 1.7, 1.4)*1e-16 ergs cm^-2 s^-1 Ang ^-1	Reference Frame: SIMBAD
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</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	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F165LP		POS TARG 0,0,3		625 Secs (600 Secs) [=>600 Secs]	[1]
	2	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F125LP		SAME POS AS 1; SHADOW		625 Secs (600 Secs) [=>600 Secs]	[1]
	3	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F140LP		SAME POS AS 1; SHADOW		625 Secs (600 Secs) [=>600 Secs]	[1]
	4	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F150LP		SAME POS AS 1		625 Secs (600 Secs) [=>600 Secs]	[1]



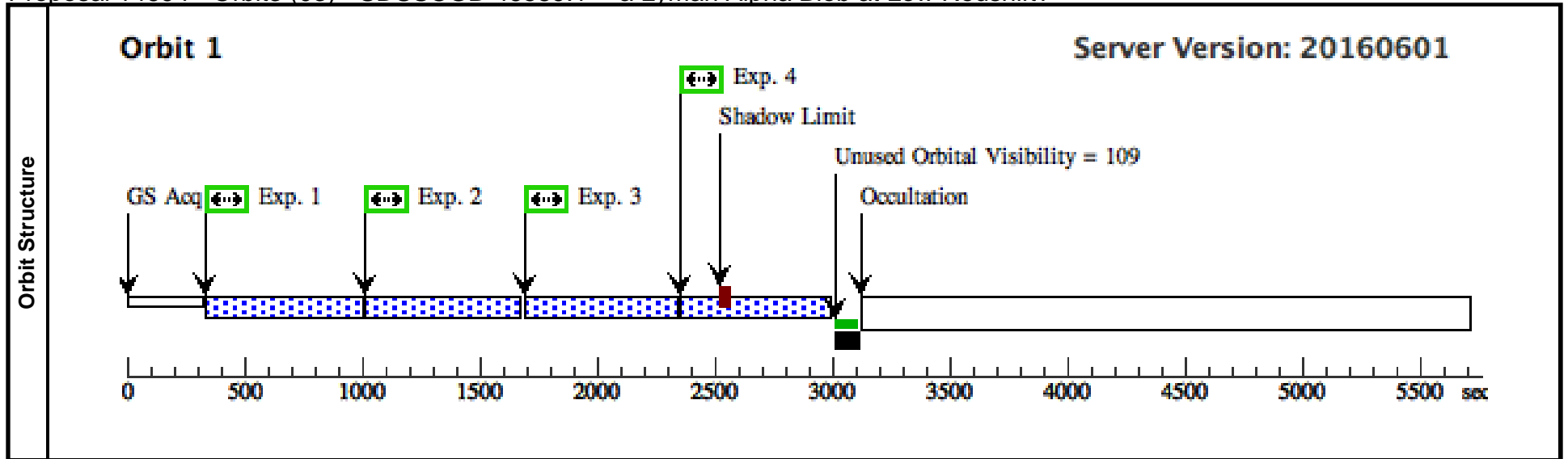
Proposal 14694 - Orbit3 (03) - SDSSCGB-46589.1 -- a Lyman Alpha Blob at Low Redshift?

Fri Jul 29 18:53:50 GMT 2016

Visit	Proposal 14694, Orbit3 (03)				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: ACS/SBC				
	Special Requirements: SCHED 60%				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	SDSSCGB-46589.1	RA: 14 03 18.1820 (210.8257583d) Dec: +15 13 55.93 (15.23220d) Equinox: J2000		V=17.9+/-0.05 (fuv, nuv, u, g, r, i, z) = (5.8, 2.6, 1.5, 2.5, 2.2, 1.7, 1.4)*1e-16 ergs cm^-2 s^-1 Ang ^-1	Reference Frame: SIMBAD
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. 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	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F165LP		POS TARG 0,0.6		625 Secs (600 Secs) [=>600 Secs]	[1]
	2	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F125LP		SAME POS AS 1; SHADOW		625 Secs (600 Secs) [=>600 Secs]	[1]
	3	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F140LP		SAME POS AS 1; SHADOW		625 Secs (600 Secs) [=>600 Secs]	[1]
	4	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F150LP		SAME POS AS 1		625 Secs (600 Secs) [=>600 Secs]	[1]



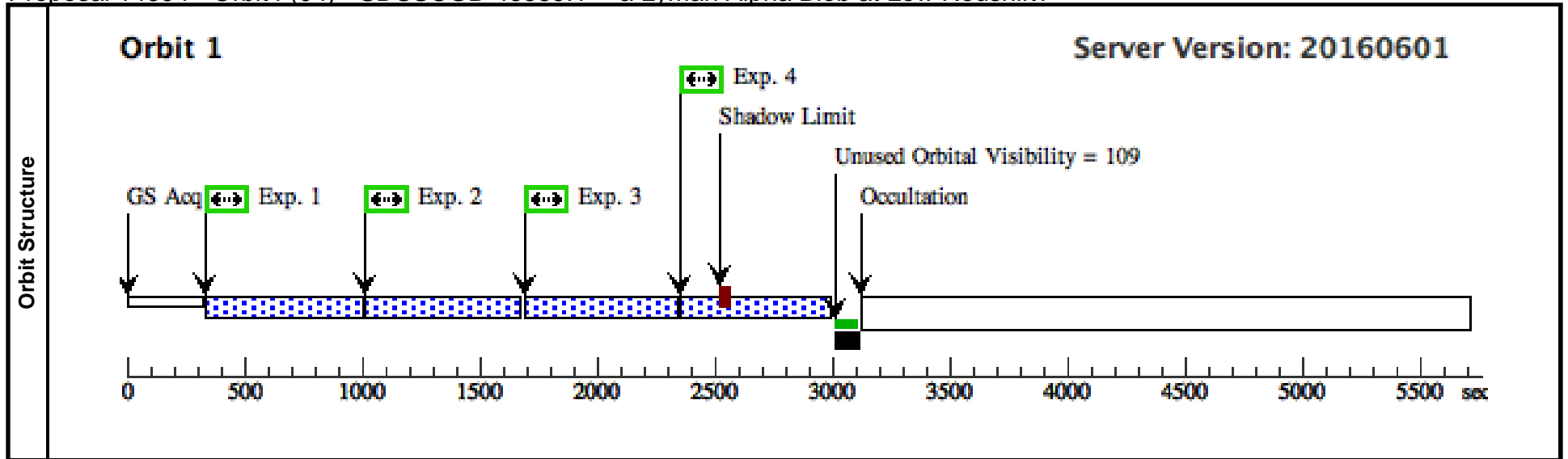
Proposal 14694 - Orbit4 (04) - SDSSCGB-46589.1 -- a Lyman Alpha Blob at Low Redshift?

Fri Jul 29 18:53:50 GMT 2016

Visit	Proposal 14694, Orbit4 (04)				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: ACS/SBC				
	Special Requirements: SCHED 60%				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	SDSSCGB-46589.1	RA: 14 03 18.1820 (210.8257583d) Dec: +15 13 55.93 (15.23220d) Equinox: J2000		V=17.9+/-0.05 (fuv, nuv, u, g, r, i, z) = (5.8, 2.6, 1.5, 2.5, 2.2, 1.7, 1.4)*1e-16 ergs cm^-2 s^-1 Ang ^-1	Reference Frame: SIMBAD
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. 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	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F165LP		POS TARG 0,0.9		625 Secs (600 Secs) [=>600 Secs]	[1]
	2	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F125LP		SAME POS AS 1; SHADOW		625 Secs (600 Secs) [=>600 Secs]	[1]
	3	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F140LP		SAME POS AS 1; SHADOW		625 Secs (600 Secs) [=>600 Secs]	[1]
	4	(ACS.im.80 9407)	(1) SDSSCGB-4658 9.1	ACS/SBC, ACCUM, SBC	F150LP		SAME POS AS 1		625 Secs (600 Secs) [=>600 Secs]	[1]



Proposal 14694 - Orbit5 (05) - SDSSCGB-46589.1 -- a Lyman Alpha Blob at Low Redshift?

Fri Jul 29 18:53:50 GMT 2016

Visit	Proposal 14694, Orbit5 (05)				
	Diagnostic Status: No Diagnostics				
	Scientific Instruments: ACS/SBC				
	Special Requirements: SCHED 60%				

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	SDSSCGB-46589.1	RA: 14 03 18.1820 (210.8257583d) Dec: +15 13 55.93 (15.23220d) Equinox: J2000			V=17.9+/-0.05 (fuv, nuv, u, g, r, i, z) = (5.8, 2.6, 1.5, 2.5, 2.2, 1.7, 1.4)*1e-16 ergs cm^-2 s^-1 Ang ^-1
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</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	(ACS.sp.809 711)	(1) SDSSCGB-46589.1	ACS/SBC, ACCUM, SBC	PR130L			POS TARG 0,0		625 Secs (620 Secs)	
										[=>620.0 Secs]	[1]
	2	(ACS.sp.809 711)	(1) SDSSCGB-46589.1	ACS/SBC, ACCUM, SBC	PR130L			POS TARG null,0,0; SHADOW		625 Secs (620 Secs)	
										[=>620.0 Secs]	[1]
3	(ACS.sp.809 711)	(1) SDSSCGB-46589.1	ACS/SBC, ACCUM, SBC	PR130L			POS TARG null,0,3; SHADOW		625 Secs (620 Secs)		
									[=>620.0 Secs]	[1]	
4	(ACS.sp.809 711)	(1) SDSSCGB-46589.1	ACS/SBC, ACCUM, SBC	PR130L			POS TARG null,0,3		625 Secs (620 Secs)		
									[=>620.0 Secs]	[1]	

