14276 - Understanding the star formation environment of a very low redshift, low luminosity, long Gamma Ray Burst

Cycle: 23, 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) FIELD080517	WFC3/IR WFC3/UVIS	1	23-Jul-2015 23:42:40.0	yes

1 Total Orbits Used

ABSTRACT

Gamma ray bursts (GRBs) are potentially observable to the highest redshift, but their interpretation relies on a knowledge of their hosts and environment. GRB hosts are identified by a single stellar explosion which allows strong statistical statements on the global star formation distribution. However making these relies on local, low redshift exemplars in which the conditions giving rise to bursts can be studied. Unfortunately such sources are rare.

We have identified an unusual, dusty GRB host in the local universe (host of low-luminosity GRB 080517 at z=0.09) which shows strong star formation and is exceptionally luminous in the infrared. It is also within 25 kpc and a few hundred km/s of a neighbouring galaxy, itself undergoing a merger. In this programme we wish to map this system in the ultraviolet and infrared. We will evaluate evidence for clumpy star formation and tidal interactions between the two galaxies, determining whether galaxy interactions may have contributed to the starbursts in both galaxies, and assessing whether this may have played a role in triggering the burst. If so, it is likely that the role of clustering and larger scale environment needs to be reassessed in inferences drawn from the redshift distribution of GRBs.

OBSERVING DESCRIPTION

We requested 1 orbit, to include WFC3 observations in UVIS/F275W (~1235s on target), IR/F098M (200s) and IR/F160W (200s) of a single target field which is centred on the host galaxy of GRB 080517. We were allocated the 1 orbit requested.

While the GRB host (on which our pointing is centered) is the primary target, we are also interested in a neighbouring source, 17 arcsec to the North-East, with which we believe it to be interacting. Both are visible in DSS imaging.

In Phase II, we have updated the integration times to allow for dithering of the telescope (using standard dither patterns), and to pack the orbit in order to maximise science. The F275W observation is divided into three dithered sub-exposures, each flashing the chip to minimise background. These are specified in the UVIS2 aperture, while placing the target near the corner of the chip for charge transfer efficiency (which previous experience by our team suggests is important). This choice of aperture and target placement restricts our range of roll angles in order to ensure both sources are comfortably on the chip. The two IR observations are each divided into two dithered sub-exposures. These are centred on the IR chip to allow for any roll angle and have had total integration times increased to improve depth and prevent downtime due to buffer dump.

We would appreciate careful checking of our programme, since the PI is relatively inexperienced at specifying a Hubble Phase II.

Visit

Proposal 14276, Visit 01 Fri Jul 24 03:42:41 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR, WFC3/UVIS

Special Requirements: ORIENT 150D TO 270 D

Patterns

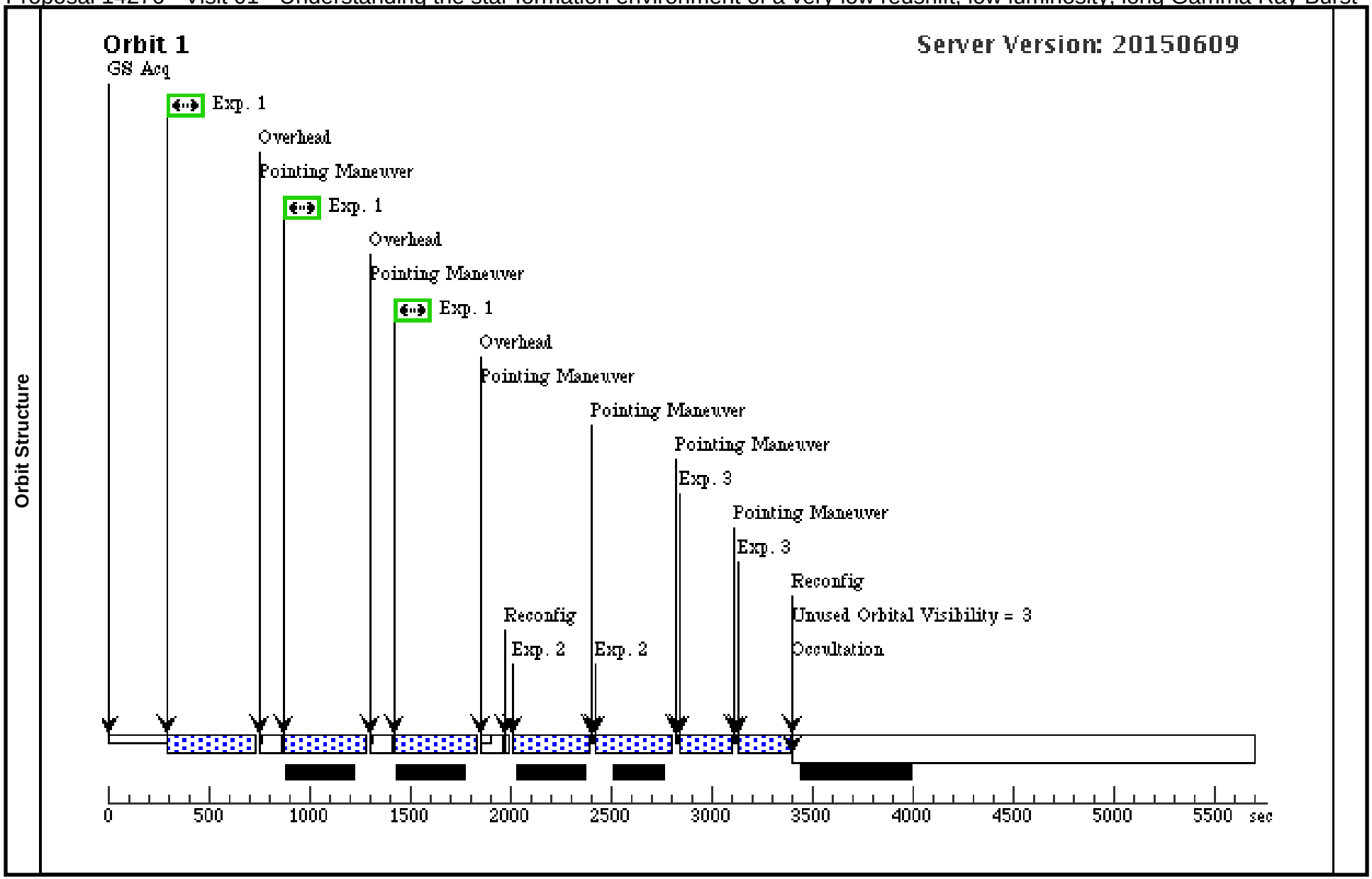
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1)
(2)	Pattern Type=WFC3-IR-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.636 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(2), (3)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	FIELD080517	RA: 06 48 57.9860 (102.2416083d) Dec: +50 44 6.82 (50.73523d) Equinox: J2000	Redshift: 0.09	V=17.5+/-0.1	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) FIELD080517	WFC3/UVIS, ACCUM, UVIS2	F275W	CR-SPLIT=NO; FLASH=12	POS TARG -60,-30	Pattern 1, Exps 1-1 in Visit 01 (1)	415 Secs (1245 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]*	***[1]***
2		(1) FIELD080517	WFC3/IR, MULTIACCUM, IR	F098M	NSAMP=8; SAMP-SEQ=SPARS50		Pattern 2, Exps 2-2 in Visit 01 (2)	352.935448 Secs (705.871 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[1]***
3		(1) FIELD080517	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=10; SAMP-SEQ=SPARS25		Pattern 2, Exps 3-3 in Visit 01 (2)	227.936926 Secs (455.874 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[1]***


Orbit Structure
Orbit 1
Server Version: 20150609
GS Acq
Exp. 1
Overhead
Pointing Maneuver
Exp. 1
Overhead
Pointing Maneuver
Exp. 1
Overhead
Pointing Maneuver
Pointing Maneuver
Pointing Maneuver
Exp. 3
Pointing Maneuver
Exp. 3
Reconfig
Unused Orbital Visibility = 3
Occultation
Reconfig
Exp. 2
Exp. 2
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec