



14805 - A rapid search for the counterpart to an active magnetar

Cycle: 24, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Prof. Andrew James Levan (PI) (ESA Member) (Contact)	The University of Warwick	a.j.levan@warwick.ac.uk
Dr. Andrew S. Fruchter (CoI) (AdminUSPI)	Space Telescope Science Institute	fruchter@stsci.edu
Dr. C. Kouveliotou (CoI)	George Washington University	ckouveliotou@gwu.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	(2) CXOJ164710	WFC3/IR	1	02-Oct-2017 15:01:28.0	yes
02	(2) CXOJ164710	WFC3/IR	1	02-Oct-2017 15:01:29.0	yes

2 Total Orbits Used

ABSTRACT

We propose to obtain a fast response observation of a magnetar undergoing an active period. Utilizing rapid, deep, diffraction limited observations with WFC3 we will maximize the chances of obtaining the IR detection of the magnetar. This in turn yields unique constraints on emission mechanisms, enables the measurement of dynamics (e.g. via proper motion) and can associate the magnetar with a given structure (e.g. young cluster or supernova remnant) in the galaxy. The association with a cluster provides means of measuring the stellar age, in turn informing the stellar properties (e.g. mass) of the magnetar progenitors. We have demonstrated the success of this approach with the detection of the counterpart of SGR 1935+2154 with a magnitude (during bursting activity) of F140W(AB)~25.5, a level extremely challenging to detect variability in from the ground, requiring multiple nights of adaptive optics imaging in typical conditions. Indeed, our observations will be sensitive to counterparts significantly fainter than it is possible to detect from any ground based observatory. These observations will allow us to break through the observational barrier

that has so far prevented us from detecting counterparts to more than two-thirds of magnetar candidates. With these observations we will construct a fuller picture of magnetars, the routes to their creation, and their role as cosmic engines across the Universe.

OBSERVING DESCRIPTION

This proposal is for rapid ToO observations of an active magnetar. The set-up is relatively simple. We will obtain deep F140W observations of one orbit duration, with two epochs separated by >6 months to search for variability. At each epoch we will obtain an identical sequence of 4x600s F140W observations with a standard 4-point dither pattern. We will time our second epoch such that the observations take place at a roll angle 0,90,180,270 from the initial observations so that diffraction spikes in crowded fields overlay each other.

Proposal 14805 - Visit 01 - A rapid search for the counterpart to an active magnetar

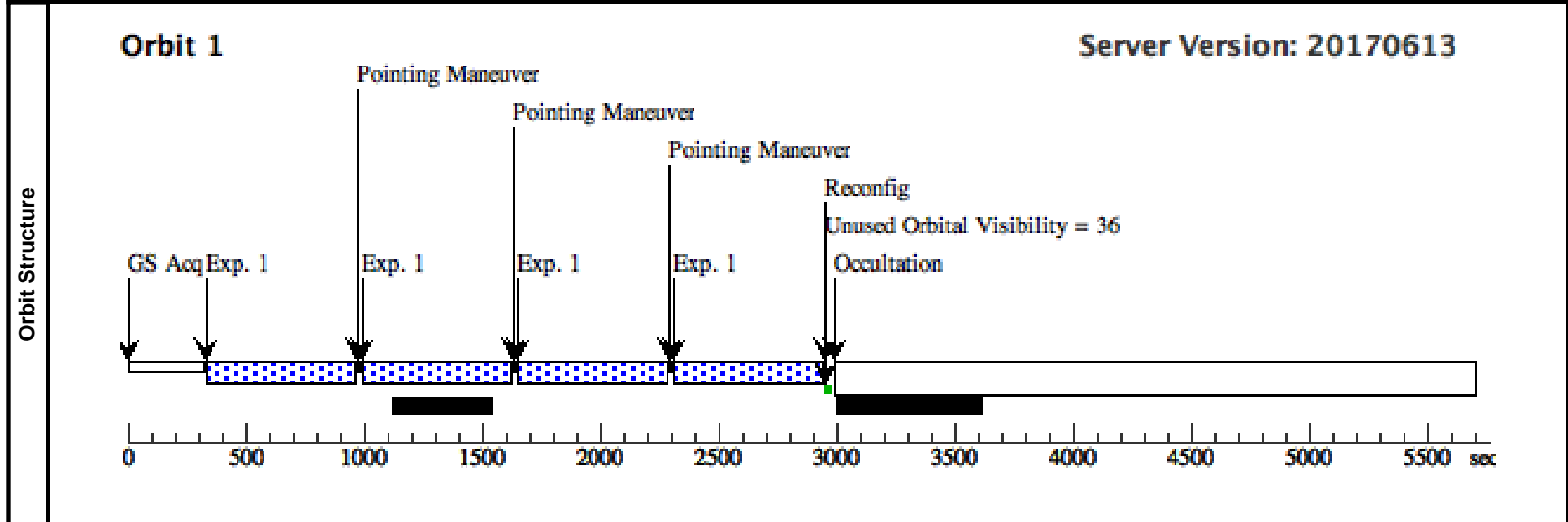
Mon Oct 02 19:01:30 GMT 2017

Visit	Proposal 14805, Visit 01, completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: SCHED 100%; ORIENT 342D TO 348 D; ON HOLD <i>On Hold Comments: Awaiting SGRB trigger</i>		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false	(1)

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	CXOJ164710	RA: 16 47 10.1550 (251.7923125d) Dec: -45 52 16.43 (-45.87123d) Equinox: J2000		V=30+/-5	Reference Frame: ICRS

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(2) CXOJ164710	WFC3/IR, MULTIACCUM, IR	F140W	SAMP-SEQ=STEP100; NSAMP=12		Pattern 1, Exps 1-1 in Visit 01 (1)	599.232292 Secs (2396.929 Secs)	[1]
									[=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)] [=>(Pattern 4)]	



Proposal 14805 - Visit 02 - A rapid search for the counterpart to an active magnetar

Mon Oct 02 19:01:30 GMT 2017

Visit	Proposal 14805, Visit 02 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: SCHED 100%; SAME ORIENT AS 01; ON HOLD <i>On Hold Comments: Awaiting SGRB trigger</i>		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(1)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=0.572 Line Spacing=0.365	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false	

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(2)	CXOJ164710	RA: 16 47 10.1550 (251.7923125d) Dec: -45 52 16.43 (-45.87123d) Equinox: J2000			V=30+/-5

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(2) CXOJ164710	WFC3/IR, MULTIACCUM, IR	F140W	SAMP-SEQ=STEP100; NSAMP=12			Pattern 1, Exps 1-1 in Visit 02 (1)	599.232292 Secs (2396.929 Secs)

