14463 - Identifying the Progenitor of a New Red Transient

Cycle: 23, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Mr. Bruce McCollum (PI) (Contact)	**Catholic University of America**	**mccollub@cua.edu**
Dr. Frederick C. Bruhweiler (CoI)	Catholic University of America	bruhweiler@cua.edu
Lee Rottler (CoI)	Pisgah Astronomical Research Institute (PARI)	rottler@lick.ucsc.edu
Dr. Seppo J. Laine (CoI)	California Institute of Technology	seppo@ipac.caltech.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
07	(1) S-15NZ	WFC3/UVIS	1	12-Dec-2015 21:02:16.0	yes
08	(1) S-15NZ	WFC3/IR	1	12-Dec-2015 21:02:18.0	yes

2 Total Orbits Used

ABSTRACT

Red transients are a recently-recognized, fundamentally new type of stellar outburst. At least one, V1309 Sco, was the first observed case of a merger between two nondegenerate stars. The outburst mechanism remains a matter of some disagreement. It is widely suspected that there is more than one different type of outburst occurring among the red transients. A major problem in trying to model the outburst mechanisms is that the spectral class of the progenitor object is fairly well known in only one or two cases. We have found a set of WFC3 images covering the field including one red transient in fifteen different photometric bandpasses. This will provide the most complete SED of any red transient progenitor, and hence the most precise spectroscopic classification. Also, the distance in this case is known

to high precision. However, the uncertainty in the coordinates of this transient is such that several objects in the pre-outburst images might be the progenitor. We request a small amount of new WFC3 imaging to determine which object is the progenitor by comparing the location of the transient relative to other stars nearby in the new images. Once it is identified, we will perform photometry on the archival images to construct the SED of the progenitor and derive its spectral type. The combination of precise spectral type and precise distance will make this object fundamentally valuable for modeling red transients.

OBSERVING DESCRIPTION

Exposures of same field. Target is a transient detected by Spitzer in July, 2015. This field was imaged in these bandpasses by another program before the transient was discovered. The goal of our program is primarily to locate to within one pixel the precursor star in that crowded field so that archival data can be used to get an SED of it. The secondary goal is to obtain an SED of the transient. No data on this transient have been published except for the Spitzer data, and the transient's SED is not well known based on the nature of the source, so we use multple bandpasses based on a crude extrapolation of the slope from the Spitzer channels.

Visit

Proposal 14463, multi filter optical (07) Sun Dec 13 02:02:19 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: (none)

Patterns

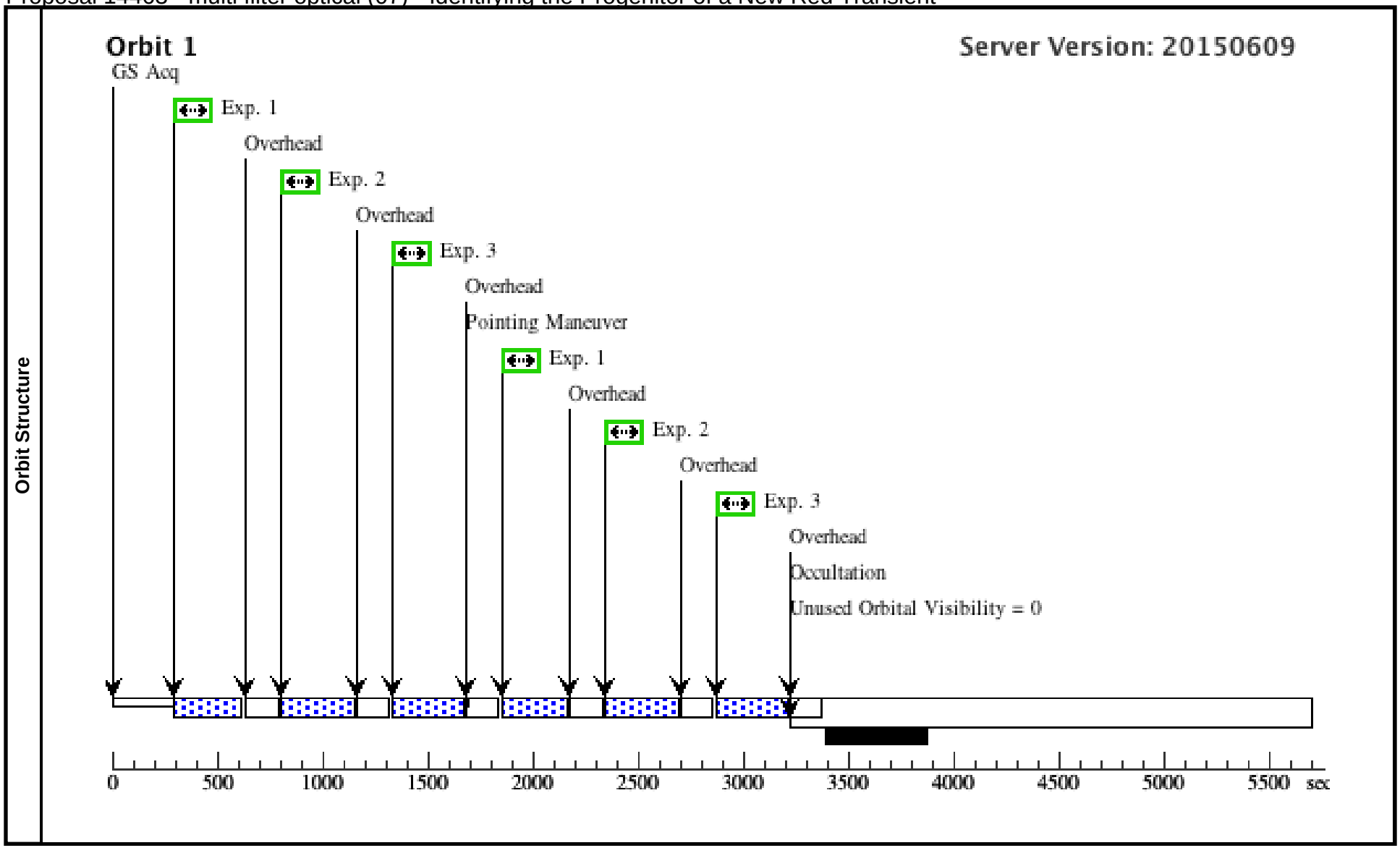
#	Primary Pattern		Secondary Pattern	Exposures
(1)	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false		(1-3)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	S-15NZ	RA: 13 37 8.3700 (204.2848750d) Dec: -29 50 19.70 (-29.83881d) Equinox: J2000		V=20	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F814W WF PC2 wide I	(1) S-15NZ	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F814W	FLASH=7		Pattern 1, Exps 1-3 in multi filter optical (07) (1)	292 Secs (584 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[1]***
2	F625W SDSS r	(1) S-15NZ	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F625W	FLASH=5		Pattern 1, Exps 1-3 in multi filter optical (07) (1)	323 Secs (646 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[1]***
3	F606W V	(1) S-15NZ	WFC3/UVIS, ACCUM, UVIS2-2K2C-SUB	F606W			Pattern 1, Exps 1-3 in multi filter optical (07) (1)	320 Secs (640 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[1]***


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

Visit

Proposal 14463, IR (08) Sun Dec 13 02:02:19 GMT 2015

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/IR

Special Requirements: (none)

Patterns

#	Primary Pattern		Secondary Pattern	Exposures
(2)	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		(1-3)

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	S-15NZ	RA: 13 37 8.3700 (204.2848750d) Dec: -29 50 19.70 (-29.83881d) Equinox: J2000		V=20	Reference Frame: ICRS

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F160W	(1) S-15NZ	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=8; SAMP-SEQ=STEP100		Pattern 2, Exps 1-3 in IR (08) (2)	199.231 Secs (796.924 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
2	F125W	(1) S-15NZ	WFC3/IR, MULTIACCUM, IR	F125W	NSAMP=8; SAMP-SEQ=STEP200		Pattern 2, Exps 1-3 in IR (08) (2)	199.231 Secs (796.924 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***
3	F140W	(1) S-15NZ	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=8; SAMP-SEQ=STEP100		Pattern 2, Exps 1-3 in IR (08) (2)	199.231 Secs (796.924 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]* *[==>(Pattern 3)]* *[==>(Pattern 4)]*	***[1]***

Orbit Structure