14614 - Death or Survival? Determining the nature of SNe IIn-P explosions

Cycle: 24, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
Dr. Jon Mauerhan (PI) (Contact)	**University of California - Berkeley**	**mauerhan@astro.berkeley.edu**
Dr. Nathan Smith (CoI)	University of Arizona	nathans@as.arizona.edu
Dr. Ori Dosovitz Fox (CoI)	Space Telescope Science Institute	ofox@stsci.edu
Prof. Alex V. Filippenko (CoI)	University of California - Berkeley	alex@astro.berkeley.edu

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) SN-2011HT	WFC3/UVIS	3	09-Nov-2016 11:26:12.0	yes

3 Total Orbits Used

ABSTRACT

An increasing number of transients classifiable as interacting supernovae of Type IIn have become the subject of intense debate, as the death or survival of the precursor star is unclear. This is because giant non-terminal eruptions from massive luminous blue variable (LBV) stars can spectroscopically resemble SNe IIn and achieve comparable luminosities via shock interaction with pre-existing circumstellar material (CSM). The stellar origin of the new SNe IIn-P class of explosions is particularly controversial. Competing interpretations predict stellar progenitors with very different initial masses and explosion outcomes: 1) non-terminal super-Eddington eruptions from LBVs; 2) collapsars from very massive stars that should die within their natal OB associations; and 3) electron-capture SNe from super-AGB stars with dense CSM envelopes. To resolve the uncertain origin of SNe IIn-P, we propose a simple and inexpensive optical imaging experiment to see if there is a luminous surviving star remaining

at the site. UV imaging is also proposed to determine the nature of a UV source detected in pre-explosion GALEX images, and to survey the progenitor's environment for sibling O-type stars.

OBSERVING DESCRIPTION

WFC3/UVIS exposures will be obtained through filters F275W, F438W, F555W, and F814W.
This is a 3-orbit program. The F275W and F438W exposures will each require 1 orbit.
The F555W and F814 exposures will both be obtained within the 3rd orbit.

For all images the ACCUM mode will be used using the default CR-SPLIT=2 for cosmic ray removal.

The optimal UVIS aperture will define the pointing center of the full-frame images.

All exposures will receive a post-flash of 12e- to mitiagte the effects of the charge transfer efficiency.

Visit

Proposal 14614, Visit 01, implementation Wed Nov 09 16:26:13 GMT 2016

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: PCS MODE FINE

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), (2), (3), (4)

Fixed Targets

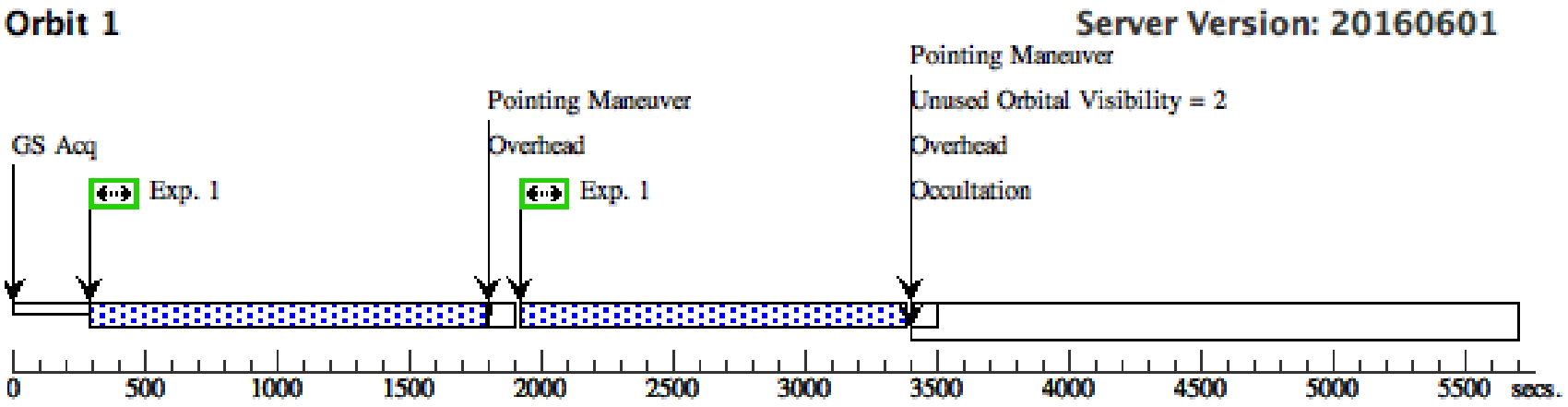
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN-2011HT	RA: 10 08 10.5800 (152.0440833d) Dec: +51 50 57.10 (51.84919d) Equinox: J2000		V=25.5+/-.5	Reference Frame: SIMBAD

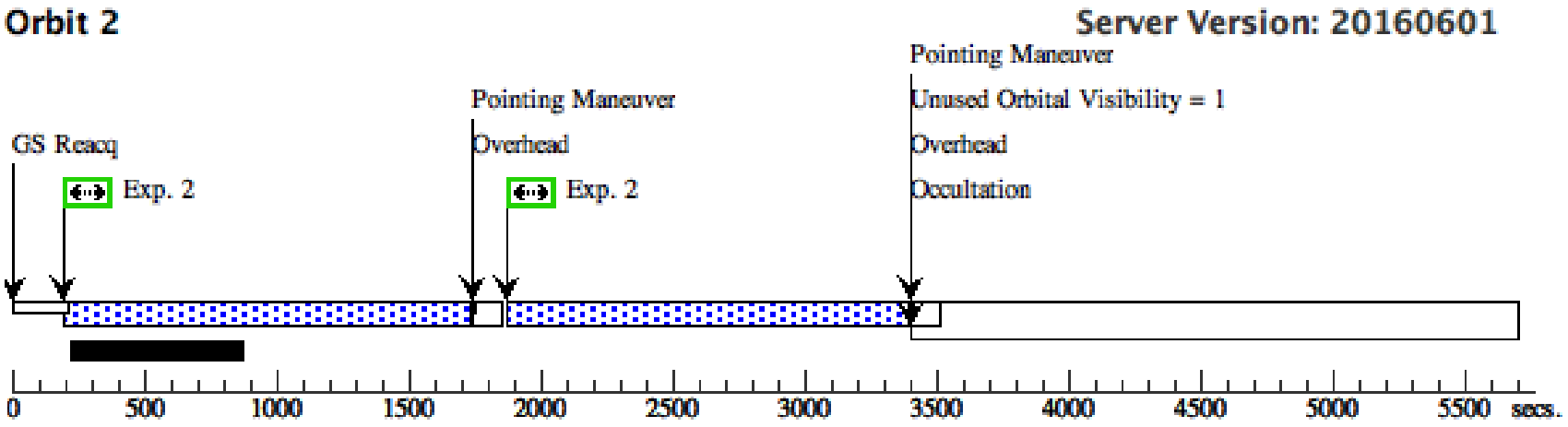
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.

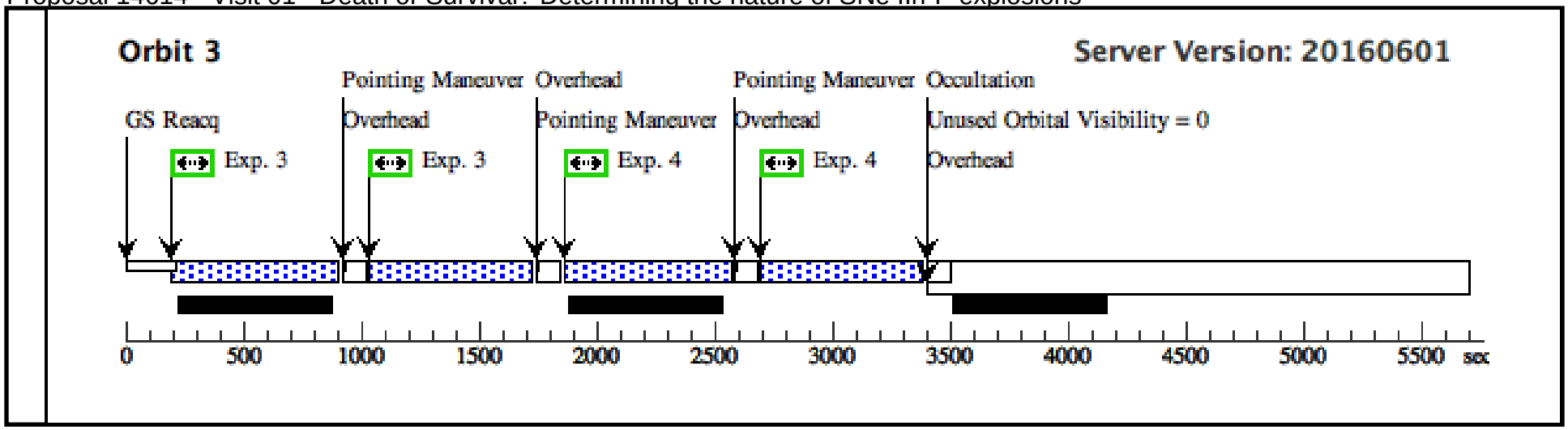
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1	F438W	(1) SN-2011HT	WFC3/UVIS, ACCUM, UVIS	F438W			Pattern 1, Exps 1-1 in Visit 01 (1)	1481 Secs (2932 Secs) *[==>1466.0 Secs (Pattern 1)]* *[==>1466.0 Secs (Pattern 2)]*	***[1]***
2	F275W	(1) SN-2011HT	WFC3/UVIS, ACCUM, UVIS	F275W	FLASH=9		Pattern 1, Exps 2-2 in Visit 01 (1)	1519 Secs (3038 Secs) *[==>(Pattern 1)]* *[==>(Pattern 2)]*	***[2]***
3	F555W	(1) SN-2011HT	WFC3/UVIS, ACCUM, UVIS	F555W			Pattern 1, Exps 3-3 in Visit 01 (1)	700 Secs (1386 Secs) *[==>693.0 Secs (Pattern 1)]* *[==>693.0 Secs (Pattern 2)]*	***[3]***
4	F814W	(1) SN-2011HT	WFC3/UVIS, ACCUM, UVIS	F814W			Pattern 1, Exps 4-4 in Visit 01 (1)	1150 Secs (1386 Secs) *[==>693.0 Secs (Pattern 1)]* *[==>693.0 Secs (Pattern 2)]*	***[3]***

Orbit Structure






Orbit 3
Server Version: 20160601
GS Reacq
Exp. 3
Pointing Maneuver
Overhead
Exp. 3
Overhead
Pointing Maneuver
Exp. 4
Pointing Maneuver
Overhead
Exp. 4
Occultation
Unused Orbital Visibility = 0
Overhead
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec