14763 - Exploring the source of the late-time brightness of SN 2011dh

Cycle: 24, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*	*E-Mail*
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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) SN-2011DH	WFC3/UVIS	3	29-Jul-2016 15:19:29.0	yes

3 Total Orbits Used

ABSTRACT

Late-time HST broad-band photometric observations of SN 2011dh in 2014 and 2016 have shown that, rather than continuing to decline in brightness, the light curve is flattening off. The reason for this is unknown, but could be due to "freeze-out" in the ejecta, the onset of interaction between the ejecta and a new dense circumstellar medium, the presence of a light echo or, even, the presence of a binary companion being slowly revealed. Scenarios involving the onset of interaction between the ejecta and a distant circumstellar medium and the presence of a light echo in a dust shell around the SN, all depend directly on the mass loss history of the Yellow Supergiant progenitor. We propose a series of broad and narrow band observations of SN 2011dh to test each of the possible scenarios, and place constraints on the current properties of the ejecta of this SN and the mass loss history of the star that exploded. Only HST is capable of providing the combination of spatial resolution and depth at UV and optical wavelengths that will be critical to making precise photometric measurements of SN 2011dh.

OBSERVING DESCRIPTION

The aim of this program is to acquire a series of broad and narrow band photometric observations of the fading Type IIb SN 2011dh.

We aim to reach F336W~25.5, F555W~25.5 and F814W ~24.5 @ S/N=3 and 0.5 *10^(-18) ergs s^-1 cm^-2 A^-1 in the F631N and F657N bands, respectively.

The observations in each filter will only require a single cr-split with a dither offset to enable rejection of hotpixels (and other detector artifacts) and cosmic rays, but resampling of the PSF is not required.

Visit

Proposal 14763, Visit 01 Fri Jul 29 19:19:30 GMT 2016

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), (2), (3-5)

Fixed Targets

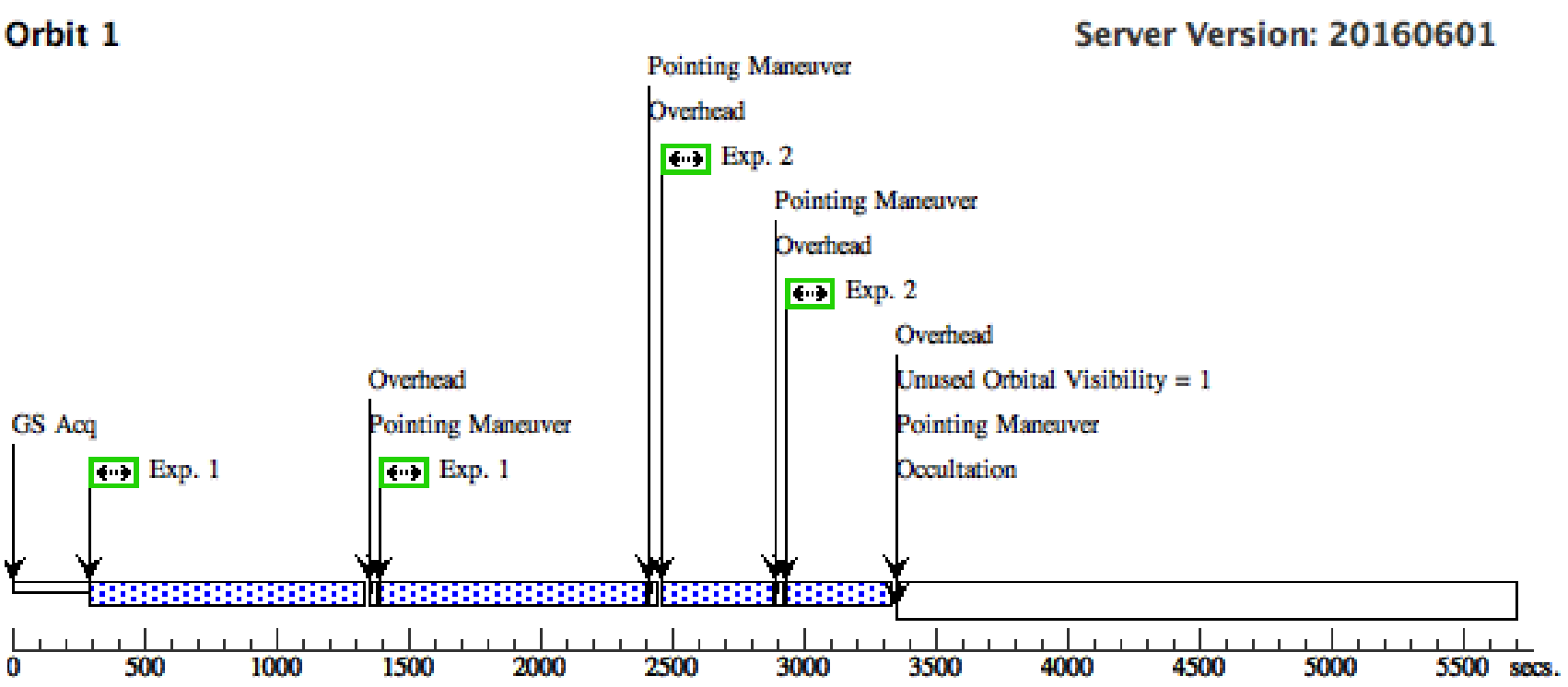
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	SN-2011DH	RA: 13 30 5.1055 (202.5212729d) Dec: +47 10 10.92 (47.16970d) Equinox: J2000		V=25.5+/-0.1	Reference Frame: SIMBAD

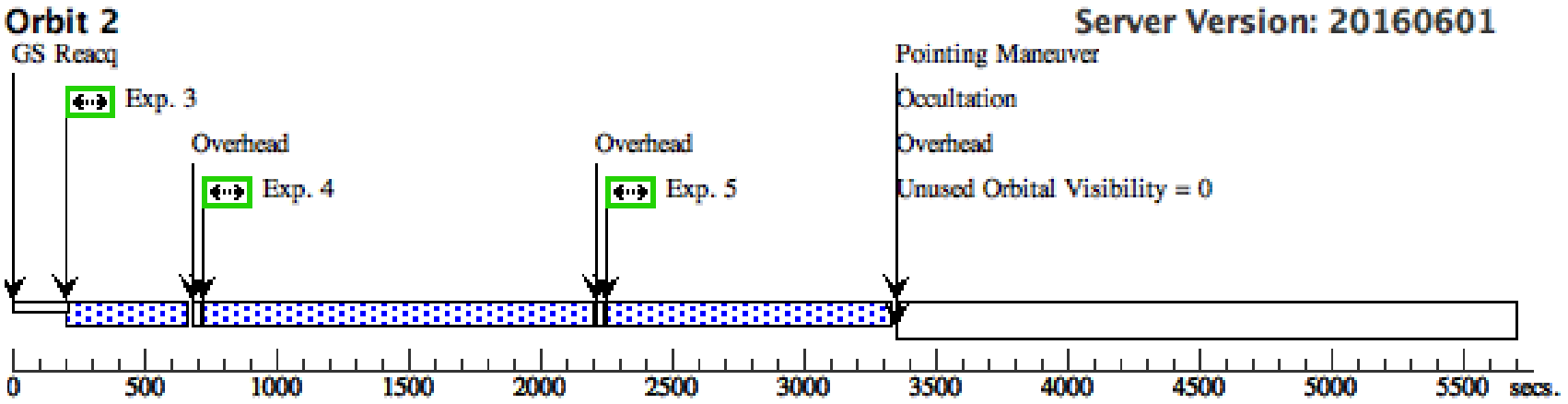
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Extended=NO

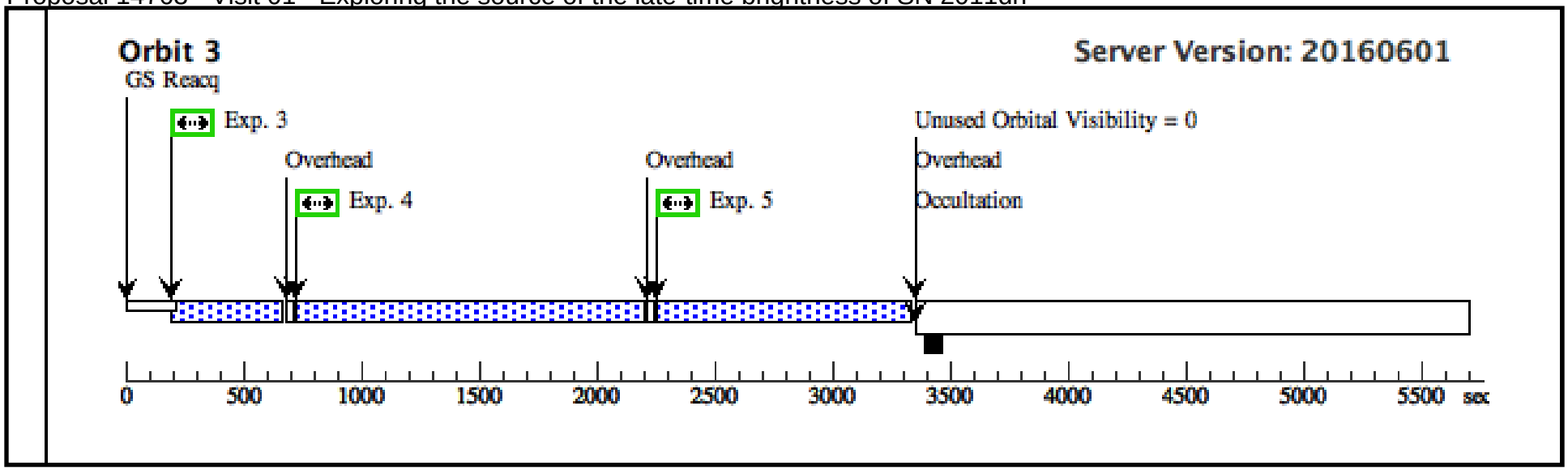
Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) SN-2011DH	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F336W	FLASH=12		Pattern 1, Exps 1-1 in Visit 01 (1)	1010 Secs (2020 Secs)	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
2		(1) SN-2011DH	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F555W	FLASH=2		Pattern 1, Exps 2-2 in Visit 01 (1)	400 Secs (800 Secs)	
								[==>(Pattern 1)]	***[1]***
								[==>(Pattern 2)]	
3		(1) SN-2011DH	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F814W	FLASH=2		Pattern 1, Exps 3-5 in Visit 01 (1)	450 Secs (900 Secs)	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	***[3]***
4		(1) SN-2011DH	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F631N	FLASH=8		Pattern 1, Exps 3-5 in Visit 01 (1)	1460 Secs (2920 Secs)	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	***[3]***
5		(1) SN-2011DH	WFC3/UVIS, ACCUM, UVIS2-C512C-SUB	F657N	FLASH=8		Pattern 1, Exps 3-5 in Visit 01 (1)	1060 Secs (2120 Secs)	
								[==>(Pattern 1)]	***[2]***
								[==>(Pattern 2)]	***[3]***

Orbit Structure






Orbit 3
Server Version: 20160601
GS Reacq
Exp. 3
Overhead
Exp. 4
Overhead
Exp. 5
Unused Orbital Visibility = 0
Overhead
Occultation
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
sec