



10513 - The very late phases of a thermonuclear supernova

Cycle: 14, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets</i>	<i>Configurations</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) SN2003HV	ACS/WFC	3	10-Oct-2005 21:05:15.0	yes
02	(1) SN2003HV	NIC2	4	10-Oct-2005 21:05:35.0	yes

7 Total Orbits Used

ABSTRACT

A better understanding of the physics of Type Ia supernovae (SNe) is important for their use as cosmological standard candles. Late time observations of the SN light curves are poorly studied - but offers a unique way to probe the explosion models. Combining state of the art models of 3-D explosions with sophisticated spectral modeling, we can test these models against observations in a way not earlier possible. In particular, the broad band light curves are sensitive to the degree of clumping and the timing of the 'infra-red catastrophe', factors which depend on the explosion mechanism (deflagration vs. delayed detonation). Further, these observations can probe the degree of positron trapping in the ejecta, important for

Proposal 10513 - Overview

both the SN ejecta and for the production of free positrons in the galaxy. Because of its small distance, favorable galaxy location and excellent ground based follow-up - SN 2003hv offers a unique opportunity to obtain the best late light curves to date. Observations in several optical and IR bands will enable us to distinguish between different model predictions.

OBSERVING DESCRIPTION

We propose to observe SN 2003hv over seven (7) orbits, employing the ACS and NICMOS instruments. The predicted magnitudes and exposure times needed for each band are shown in the following table.

These observations are requested to occur between the dates of November 1, 2005 and December 10, 2005. Roughly one orbit per band is requested using ACS to detect the SN in the B, V, and I bands, while four orbits are requested using NICMOS to detect the SN in the H band. During the course of the NICMOS observations, we propose to dither about the target in a square pattern with Small Angle Maneuvers of 1".

Filter & Normalization & Predicted & Faint & ETC Exp. & Estimated \\
Requested & Filter & Magnitude & Magnitude & Required [s] & Exp. [s] \\
\hline

F435W	Johnson-B	25.5	26.0	1200	1710
F555W	Johnson-V	25.5	26.0	1400	1740
F814W	Johnson-I	25.3	25.8	2600	3540
F160W	Bessel-H	23.5	24.0	9000	10320

REAL TIME JUSTIFICATION

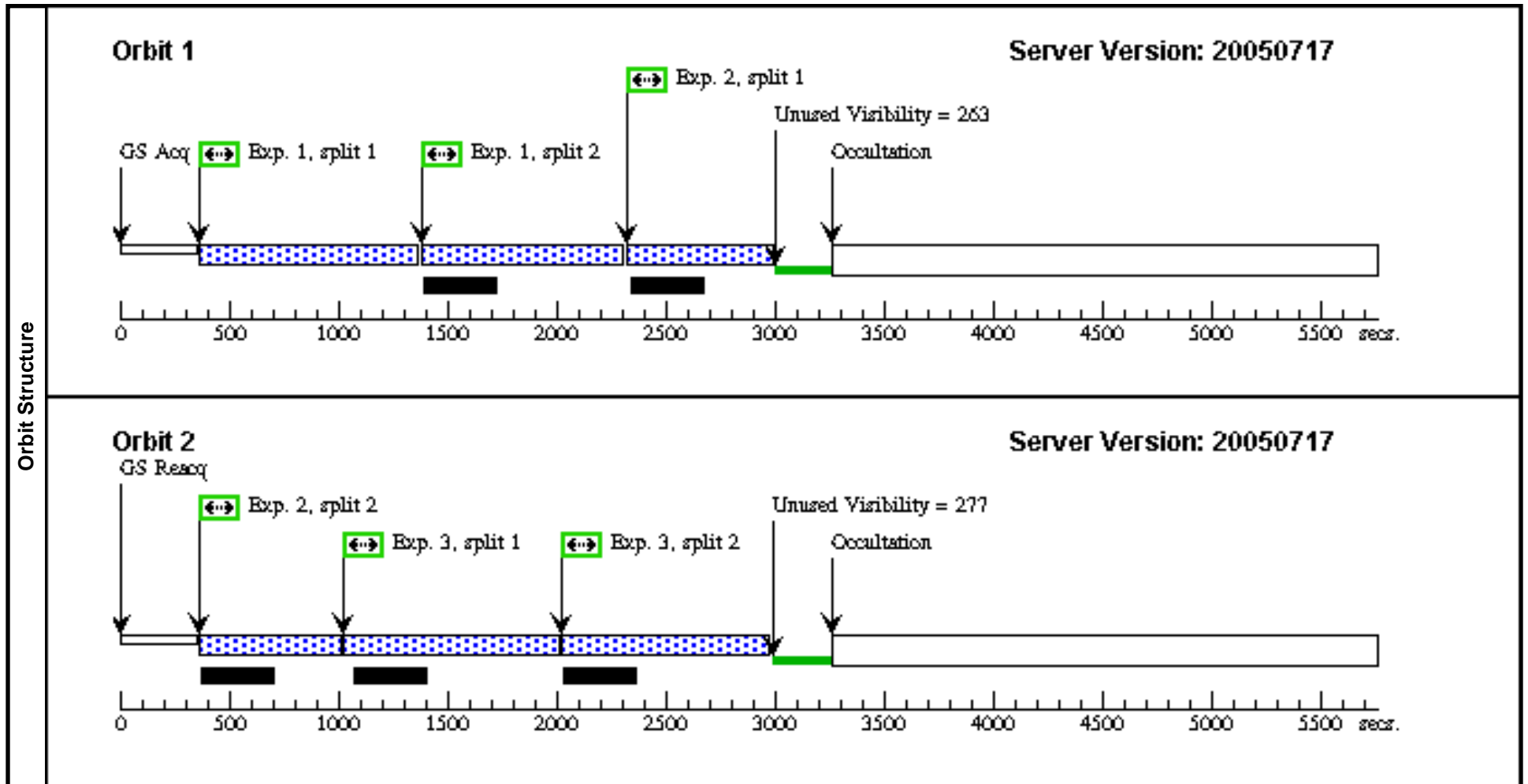
The supernova is expected to fade during the course of Cycle 14. It is important for the goals of this proposal that the observations are made more than 800 days after the explosion, but not so late that the supernova is too faint to detect.

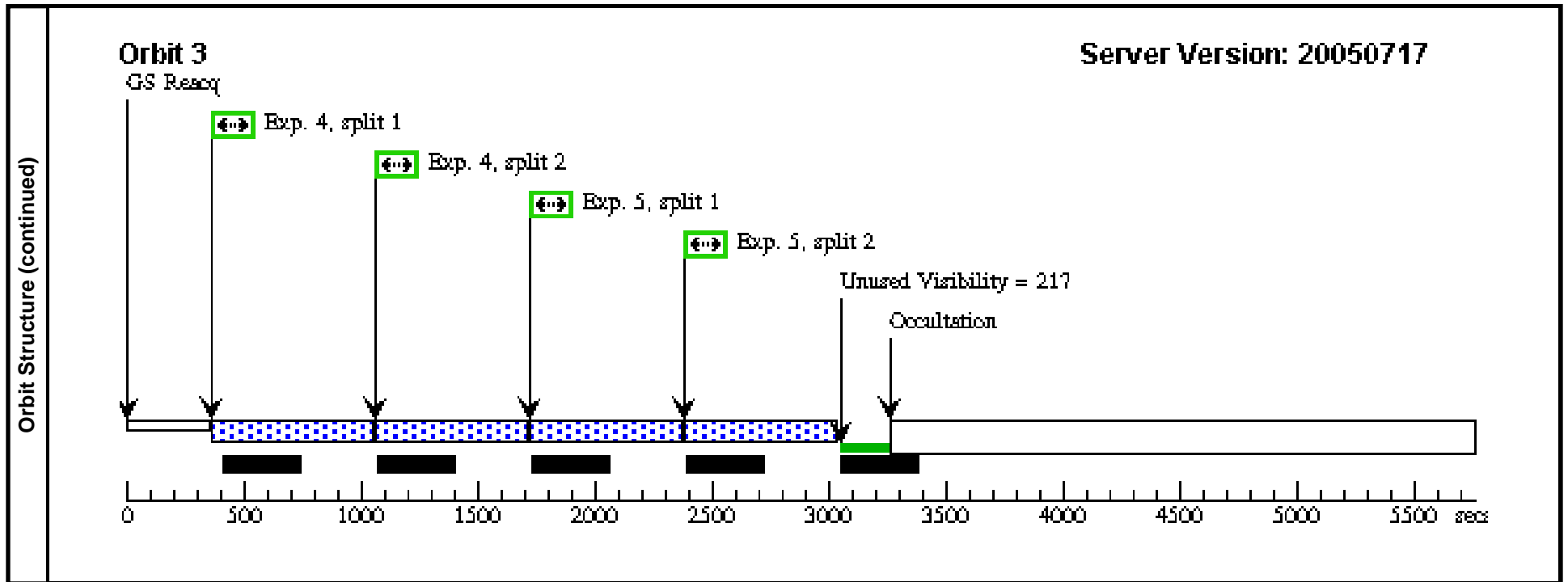
The optimal window is thus November 1, 2005, through December 15, 2005.

Proposal 10513 - Visit 01 - The very late phases of a thermonuclear supernova

Tue Oct 11 01:05:40 GMT 2005

Visit	Proposal 10513, Visit 01 Diagnostic Status: Error Scientific Instruments: ACS/WFC Special Requirements: BETWEEN 01-NOV-2005:17:12:42 AND 10-DEC-2005:23:00:00										
	Diagnosics (Visit 01) Error: ORBIT PLANNER SERVER INTERNAL ERROR (Pattern) Warning: Exposure Groups must contain at least one exposure										
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(1)	Pattern Type=WFPC2-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.559 Line Spacing=0.559		Coordinate Frame=POS-TARG Pattern Orientation=26.6 Angle Between Sides=143.1 Center Pattern=false							
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes		Miscellaneous			
	(1)	SN2003HV	RA: 03 04 9.3000 (46.0387500d) Dec: -26 05 8.00 (-26.08556d) Equinox: J2000 Plate Id: (?)			V=25.0+/-1.0		Coordinate Source: NED			
<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]		Orbit
	1	(1) SN2003HV	(1) SN2003HV	ACS/WFC, ACCUM, WFC	F435W				1600.0 Secs		
									[==>(Split 1)]		[1]
									[==>(Split 2)]		
	2	(1) SN2003HV	(1) SN2003HV	ACS/WFC, ACCUM, WFC	F814W				1050.0 Secs		
									[==>(Split 1)]		[1]
									[==>(Split 2)]		[2]
3	(1) SN2003HV	(1) SN2003HV	ACS/WFC, ACCUM, WFC	F555W				1650.0 Secs			
								[==>(Split 1)]		[2]	
								[==>(Split 2)]			
4	(1) SN2003HV	(1) SN2003HV	ACS/WFC, ACCUM, WFC	F814W			SAME POS AS 1	1050.0 Secs			
								[==>(Split 1)]		[3]	
								[==>(Split 2)]			
5	(1) SN2003HV	(1) SN2003HV	ACS/WFC, ACCUM, WFC	F814W				1050.0 Secs			
								[==>(Split 1)]		[3]	
								[==>(Split 2)]			





Proposal 10513 - Visit 02 - The very late phases of a thermonuclear supernova

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(2)	Pattern Type=NIC-SQUARE-WAVE-DITH Purpose=DITHER Number Of Points=4 Point Spacing=1.018 Line Spacing=1.018	Coordinate Frame=POS-TARG Pattern Orientation=90 Angle Between Sides=270 Center Pattern=false	

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	SN2003HV	RA: 03 04 9.3000 (46.0387500d) Dec: -26 05 8.00 (-26.08556d) Equinox: J2000 Plate Id: (?)		V=25.0+/-1.0	Coordinate Source: NED

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

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 0,0			[==>(Copy 1)] [==>(Copy 2)]	[1]
	2	(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 1.0258,0			[==>(Copy 1)] [==>(Copy 2)]	[1]
	3	(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 1.0258,1 .01655			[==>(Copy 1)] [==>(Copy 2)]	[1]
	4	(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 0,1.0165 5			[==>(Copy 1)] [==>(Copy 2)]	[1]
	5	(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 0,1.0165 5			[==>(Copy 1)] [==>(Copy 2)]	[2]
	6	(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 1.0258,1 .01655			[==>(Copy 1)] [==>(Copy 2)]	[2]
	7	(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 1.0258,0			[==>(Copy 1)] [==>(Copy 2)]	[2]
	8	(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 0,0			[==>(Copy 1)] [==>(Copy 2)]	[2]
	9	(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 0,1.0165 5			[==>(Copy 1)] [==>(Copy 2)]	[3]

Proposal 10513 - Visit 02 - The very late phases of a thermonuclear supernova

Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	10		(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 1.0258,1 .01655		[==>(Copy 1)] [==>(Copy 2)]	[3]
	11		(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 1.0258,0		[==>(Copy 1)] [==>(Copy 2)]	[3]
	12		(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 0,0		[==>(Copy 1)] [==>(Copy 2)]	[3]
	13		(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 0,1.0165 5		[==>(Copy 1)] [==>(Copy 2)]	[4]
	14		(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 1.0258,1 .01655		[==>(Copy 1)] [==>(Copy 2)]	[4]
	15		(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 1.0258,0		[==>(Copy 1)] [==>(Copy 2)]	[4]
	16		(1) SN2003HV	NIC2, MULTIACCUM, NIC2	F160W	SAMP-SEQ=STEP6 4; NSAMP=13	POS TARG 0,0		[==>(Copy 1)] [==>(Copy 2)]	[4]

