11991 - Constraining the late time lightcurve and energy of GRB 090102

Cycle: 16, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

INVESTIGATORS

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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) GRB090102	WFPC2	3	16-Jan-2009 21:01:23.0	yes
02	(1) GRB090102	WFPC2	3	16-Jan-2009 21:01:31.0	yes

6 Total Orbits Used

ABSTRACT

We propose to conduct a series of late time observations of the lightcurve of the bright gamma-ray burst GRB 090102. Declared a burst of interest by the Swift team, and with excellent broadband data covering the prompt emission (Swift and Fermi) and afterglow (Swift, TAROT, NOT, WHT, and several more), GRB 090102 offers a rare opportunity to probe the physics and energetics of GRBs. Its high energy budget (>2e53 ergs for isotropic emission) stretches plausible progenitor models, and as yet the signatures of jet-like emission have not been observed. Our late time observations will search for steepening of the afterglow due to lateral expansion of the jet. This will enable us, in tandem with the data already secured, to determine its total energy budget, and compare this to expectations for different progenitors models. HST is vital to this endeavour since it can reach depths essentially unattainable to ground based technology, while its invariant PSF will allow us to accurately remove underlying host contamination. Ultimately, the range and quality of data secured for this burst will enable us to accurately reconstruct the parameters of the explosion, and shed greater light on the physical processes which underly the production of GRBs.

OBSERVING DESCRIPTION

We propose to observe GRB 090102 at 3 epochs using WFPC2 (and ACS/WFC3 if the final epoch takes place after SM4). We will perform 3 orbit observations at each epoch utlizing the F606W filter. Our first observations should take place in the current visiblity window, which expires on the 27 Jan (this is visit1). A second set of observations (identical to the first) should take place in a second window at the end of Feb (visit 2). The final observations will aim to constrain the host galaxy contribution and can take place at a later date (in 2-gyro mode visiblity is open again at the end of Sept 09, but this will obviously be different in 3-gyro mode post SM4).

Visit

Proposal 11991, Visit 01 Sat Jan 17 02:01:36 GMT 2009

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: BEFORE 27-JAN-2009:23:59:00

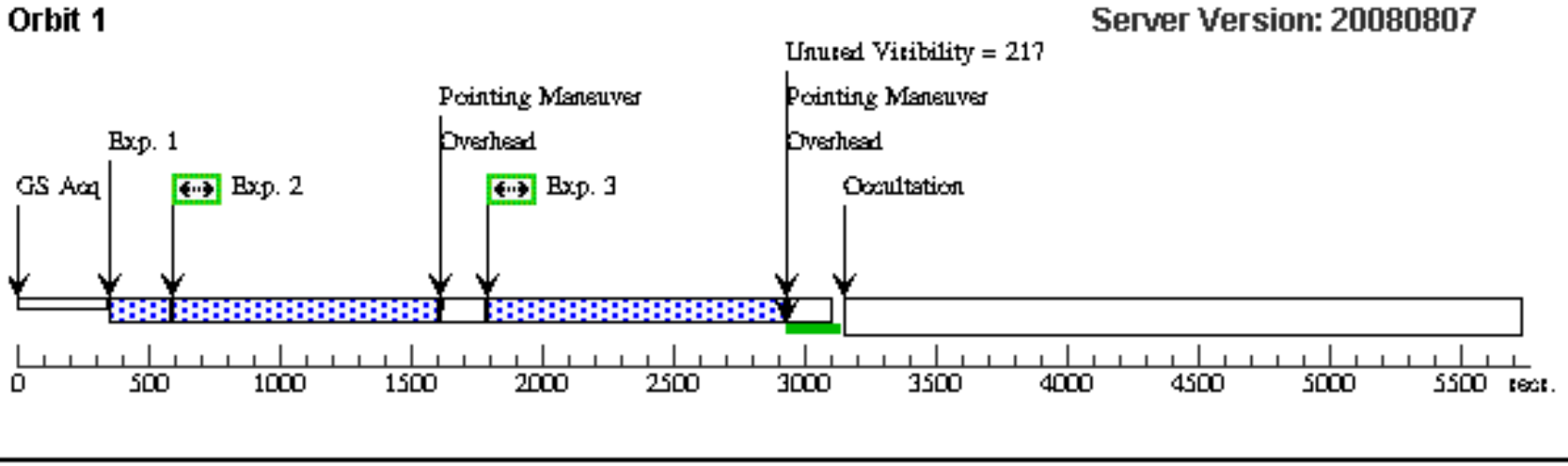
Fixed Targets

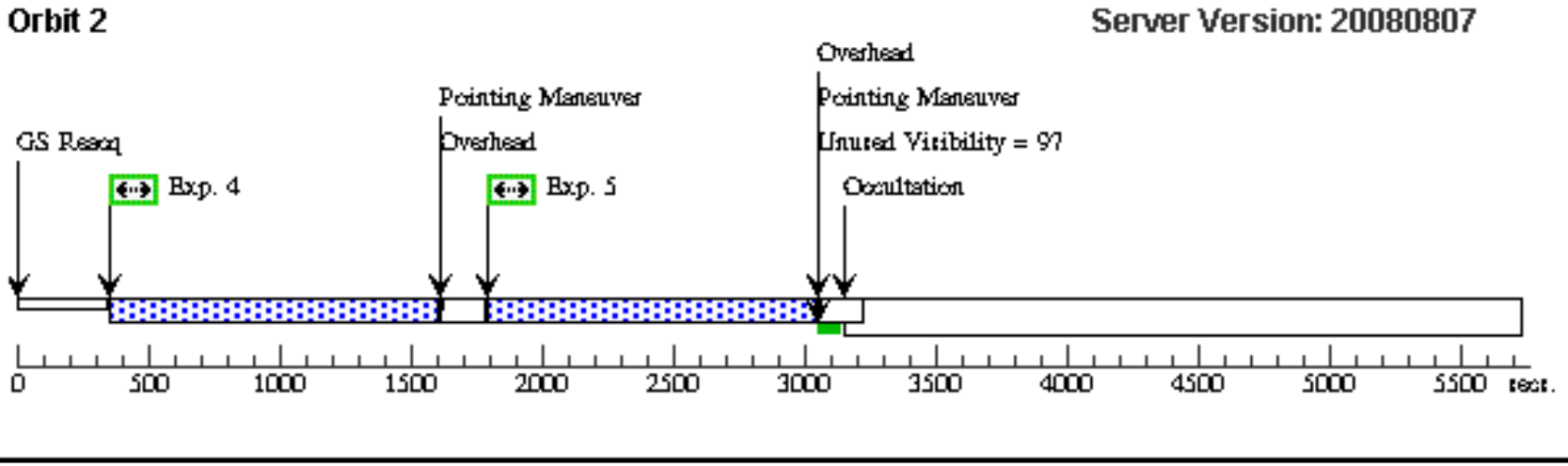
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	GRB090102	RA: 08 32 58.5200 (128.2438333d) Dec: +33 06 51.30 (33.11425d) Equinox: J2000		V=25+/-2	Reference Frame: Swift

Exposures

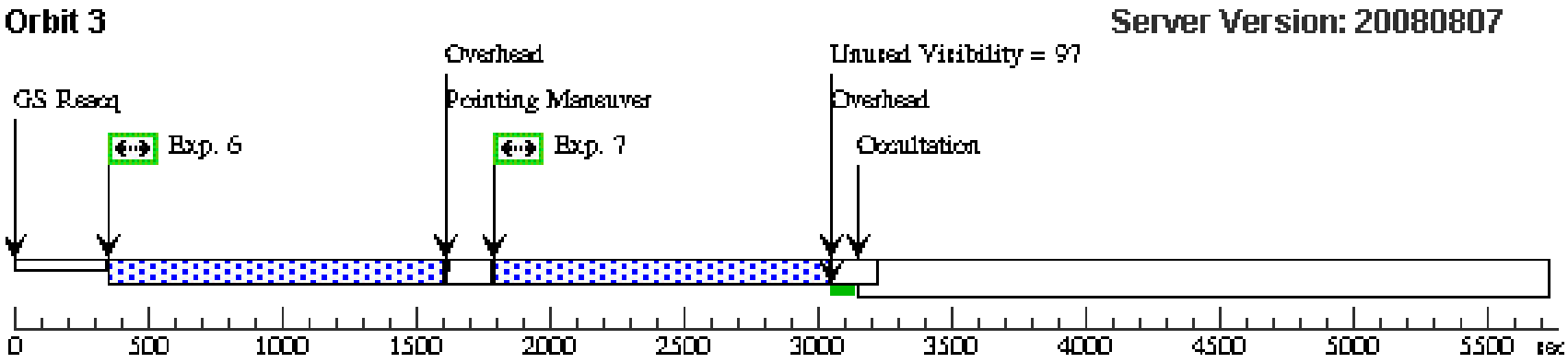
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0,0		20 Secs	
								[==>]	***[1]***
2		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0,0		1000 Secs	
								[==>]	***[1]***
3		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0,0.249		1000 Secs	
								[==>]	***[1]***
4		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0.232,0.232		1100 Secs	
								[==>]	***[2]***
5		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0.232,0.481		1100 Secs	
								[==>]	***[2]***
6		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0.464,0.464		1100 Secs	
								[==>]	***[3]***
7		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0.464,0.713		1100 Secs	
								[==>]	***[3]***

Orbit Structure





Orbit Structure (continued)



Visit

Proposal 11991, Visit 02 Sat Jan 17 02:01:37 GMT 2009

Diagnostic Status: No Diagnostics

Scientific Instruments: WFPC2

Special Requirements: BETWEEN 21-FEB-2009:01:00:00 AND 28-FEB-2009:09:06:15

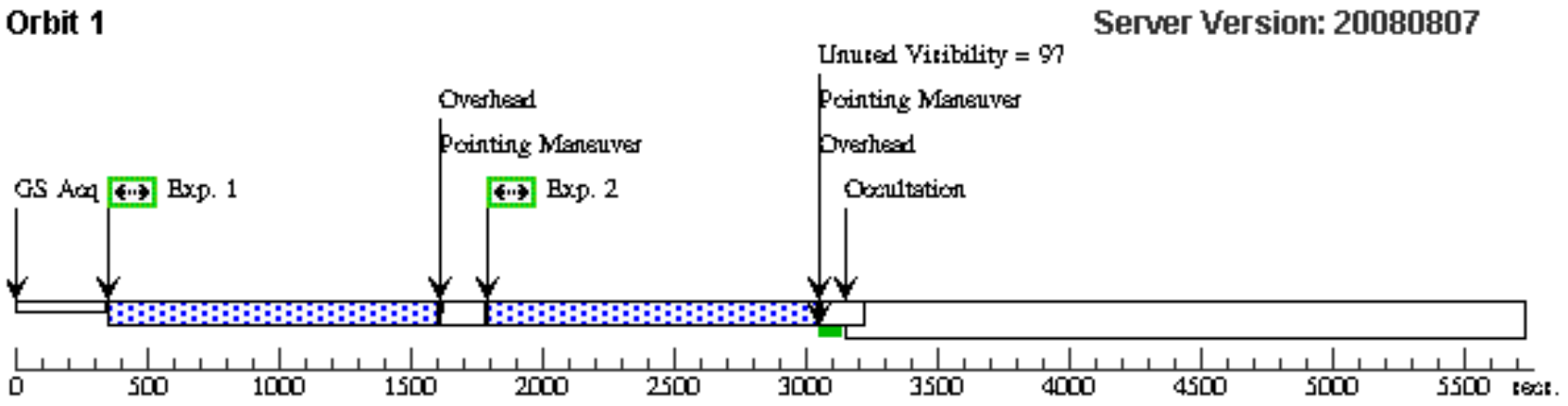
Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	GRB090102	RA: 08 32 58.5200 (128.2438333d) Dec: +33 06 51.30 (33.11425d) Equinox: J2000		V=25+/-2	Reference Frame: Swift

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
1		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0,0		1100 Secs	
								[==>]	***[1]***
2		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0,0.249		1100 Secs	
								[==>]	***[1]***
3		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0.232,0.232		1100 Secs	
								[==>]	***[2]***
4		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0.232,0.481		1100 Secs	
								[==>]	***[2]***
5		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG .464,0.464		1100 Secs	
								[==>]	***[3]***
6		(1) GRB090102	WFPC2, IMAGE, WFALL-FIX	F606W	CR-SPLIT=NO	POS TARG 0.464,0.713		1100 Secs	
								[==>]	***[3]***

Orbit Structure



Orbit Structure (continued)