



# 17298 - The afterglow, supernova and distance scale of a record-breaking gamma-ray burst

Cycle: 30, Proposal Category: GO/DD

(Availability Mode: SUPPORTED)

## INVESTIGATORS

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Dr. James Herbert Gillanders (CoI) (ESA Member)	Universita di Roma Tor Vergata

## VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) GRB230307A	WFC3/UVIS	1	19-Apr-2023 13:00:12.0	yes
02	(1) GRB230307A	WFC3/IR	1	19-Apr-2023 13:00:13.0	yes
05	(1) GRB230307A	WFC3/IR	1	19-Apr-2023 13:00:14.0	yes

3 Total Orbits Used

## ABSTRACT

The recent GRB230307A is the second brightest gamma-ray burst (GRB) of all times, and it is likely one of the most (if not the most) energetic explosions ever recorded. The expected rate of similar bright bursts is once per 100 years, and the goal of this proposal is to exploit this unique opportunity to its fullest. The requested HST observations will allow us to determine the outflow collimation, search for the associated supernova,

Proposal 17298 (STScI Edit Number: 1, Created: Wednesday, April 19, 2023 at 12:00:14 PM Eastern Standard Time) - Overview and constrain the GRB distance scale. These are crucial measurements for a complete physical picture of this extreme explosion, and will allow us to compare its intrinsic properties to the general population of GRBs. HST data are essential because of the target faintness and unfavorable position for ground-based observatories. Moreover, thanks to its superb angular resolution, HST will precisely pinpoint the GRB position within its host galaxy, constraining models of progenitor systems. These observations will be a critical component of an on-going multi-wavelength campaign, comprising X-ray, optical, nIR and radio observations.

### **OBSERVING DESCRIPTION**

This DD proposal was approved for 3 orbits.

We request VISIT 1 to include 2 ORBITS, one with WFC3/UVIS camera (F606W/F814W) and the other one with WFC3/IR camera (F105W/F140W).

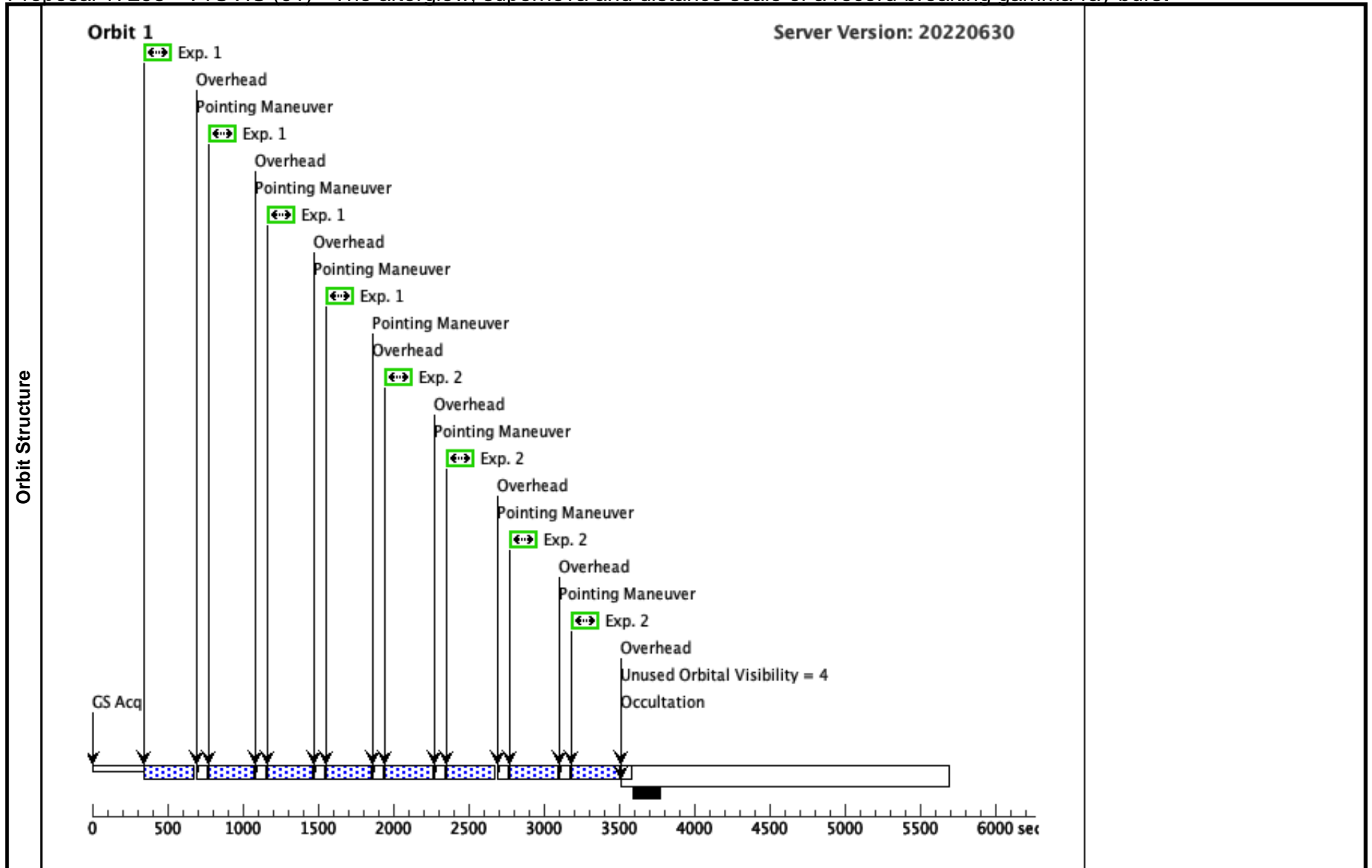
This visit should be schedule within 30 days from the GRB (April 7).

VISIT 2 includes 1 ORBIT with the WFC3/IR camera (F105W/F140W). To be performed 20 days after the first visit (April 25-30).

Proposal 17298 - V1UVIS (01) - The afterglow, supernova and distance scale of a record-breaking gamma-ray burst

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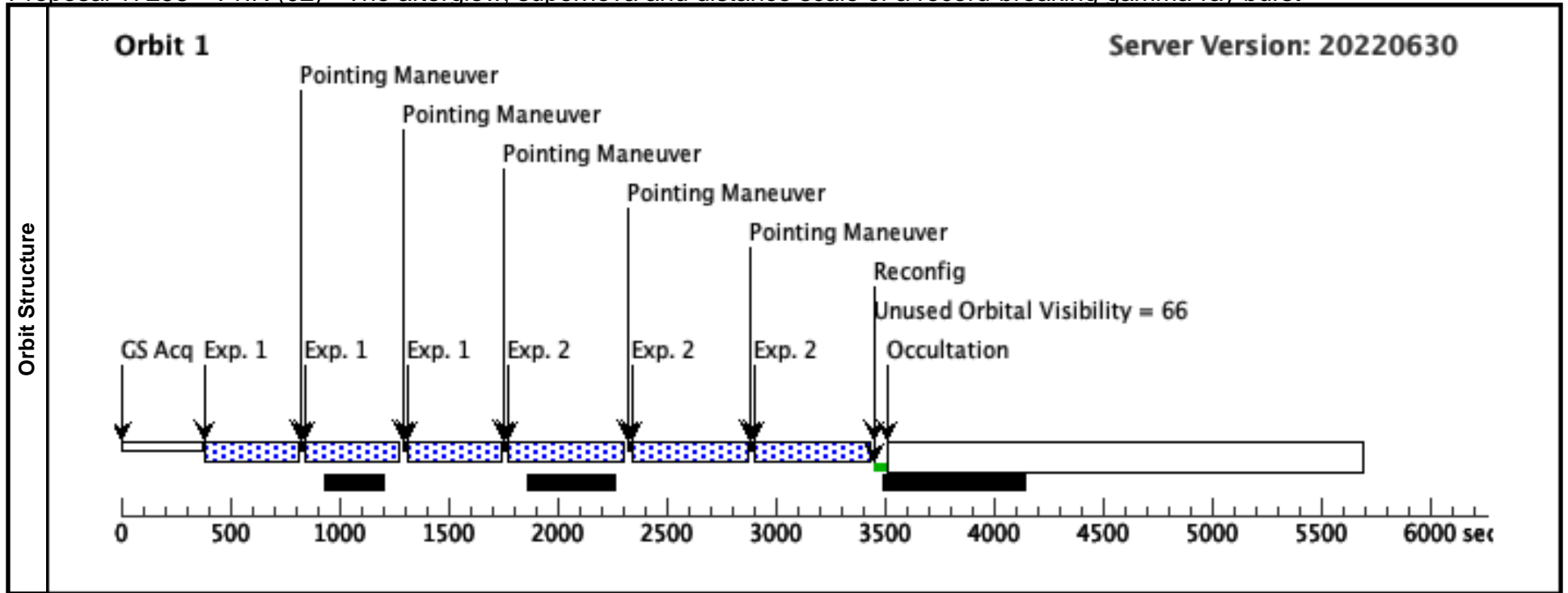
Visit	<b>Proposal 17298, V1UVIS (01), completed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 100D TO 130 D; ORIENT 150D TO 210 D; TOO RESPONSE TIME 8.0D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(3)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(1), (2)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	GRB230307A	RA: 04 03 25.9900 (60.8582917d) Dec: -75 22 42.82 (-75.37856d) Equinox: J2000		V=20	Reference Frame: ICRS				
	<i>Comments:</i> Category=STAR Description=[GAMMA RAY BURSTER] Extended=NO									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(1) GRB230307A	(1) GRB230307A	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F606W	CR-SPLIT=NO; FLASH=9			Pattern 3, Exps 1-1 in V1UVIS (01) (3)	300 Secs (1200 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]
2	(1) GRB230307A	(1) GRB230307A	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F606W	CR-SPLIT=NO; FLASH=9			Pattern 3, Exps 2-2 in V1UVIS (01) (3)	320 Secs (1280 Secs) [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[1]



Proposal 17298 - V1IR (02) - The afterglow, supernova and distance scale of a record-breaking gamma-ray burst

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Visit	<b>Proposal 17298, V1IR (02), completed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/IR Special Requirements: ORIENT 100D TO 130 D; ORIENT 150D TO 210 D; TOO RESPONSE TIME 8.0D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(2)	Pattern Type=WFC3-IR-DITHER- LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.605 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	GRB230307A	RA: 04 03 25.9900 (60.8582917d) Dec: -75 22 42.82 (-75.37856d) Equinox: J2000		V=20	Reference Frame: ICRS				
	<i>Comments:</i> Category=STAR Description=[GAMMA RAY BURSTER] Extended=NO									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(1) GRB230307A	(1) GRB230307A	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=9; SAMP-SEQ=SPAR S50		Pattern 2, Exps 1-1 i n V1IR (02) (2)	402.935899 Secs (1208.808 Secs)	
									[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]	[1]
2	(1) GRB230307A	(1) GRB230307A	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=11; SAMP-SEQ=SPAR S50		Pattern 2, Exps 2-2 i n V1IR (02) (2)	502.936801 Secs (1508.81 Secs)		
								[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]	[1]	



Proposal 17298 - V2IR (05) - The afterglow, supernova and distance scale of a record-breaking gamma-ray burst

Wed Apr 19 17:00:15 GMT 2023

Visit	<b>Proposal 17298, V2IR (05), implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/IR Special Requirements: ORIENT 150D TO 210 D; BETWEEN 18-APR-2023:00:00:00 AND 03-MAY-2023:00:00:00; TOO RESPONSE TIME 22.0D									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(5)	Pattern Type=WFC3-IR-DITHER-LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=1.5 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.788 Angle Between Sides= Center Pattern=false		(1), (2)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	GRB230307A	RA: 04 03 25.9900 (60.8582917d) Dec: -75 22 42.82 (-75.37856d) Equinox: J2000		V=20	Reference Frame: ICRS				
	<i>Comments:</i> Category=STAR Description=[GAMMA RAY BURSTER] Extended=NO									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(1) GRB230307A	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=9; SAMP-SEQ=SPAR S50			Pattern 5, Exps 1-1 in V2IR (05) (5)	402.935899 Secs (1208.808 Secs)	
									[=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)]	[1]
2	(1) GRB230307A	WFC3/IR, MULTIACCUM, IR	F105W	NSAMP=11; SAMP-SEQ=SPAR S50				Pattern 5, Exps 2-2 in V2IR (05) (5)	502.936801 Secs (1508.81 Secs)	
									[=>(Pattern 1)] [=>(Pattern 2)] [=>(Pattern 3)]	[1]

