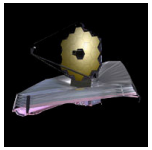

3134 - The Origins of Hostless Short Gamma-ray Bursts

Cycle: 2, Proposal Category: GO

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
GRB Target Fields				
	1	061201	NIRCam Imaging	(1) GRB061201
	2	090515	NIRCam Imaging	(2) GRB090515
	3	091109B	NIRCam Imaging	(3) GRB091109B
	4	110112A	NIRCam Imaging	(4) GRB110112A

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
	5	130912A	NIRCam Imaging	(5) GRB130912A
	555	130912A WOPR	NIRCam Imaging	(5) GRB130912A
	6	150423A	NIRCam Imaging	(6) GRB150423A

ABSTRACT

Short gamma-ray bursts (SGRBs) are explosive transients that can be seen at cosmological distances. They have been confirmed to be driven by compact object mergers and to produce kilonovae, the radioactive signature of heavy element nucleosynthesis. SGRBs are therefore valuable markers for r-process enrichment throughout the Universe, and for the rates and merger delay times of compact binaries through cosmic time. Because they fade fast, their redshifts must be derived via association with a likely host galaxy, whose redshift is measured as a proxy. However, in a number of cases no suitable host is seen to HST depths, despite precise (sub-arcsecond) localisations of the burst position. This could indicate that the compact binary travelled a substantial distance from its host before merging, or that there is a faint and/or distant host galaxy as-yet undetected at the burst location. Here, we propose NIRCam photometric observations with JWST designed to disentangle these possibilities by searching for faint hosts in the redshift range $2< z < 3.5$, which is poorly constrained by the available HST observations. Either outcome - highly kicked or high redshift - has profound implications for our understanding of the evolution of the Universe, encompassing binary evolution, natal kicks, merger delay times, gravitational-wave rates and follow-up strategy, r-process enrichment, and galaxy evolution.

OBSERVING DESCRIPTION

This proposal targets 6 nominally hostless short gamma-ray bursts to attempt to uncover faint hosts at the burst location. These observations will determine whether each GRB has a faint host that was unconstrained to HST limits, or if it was kicked a substantial distance from an already detected host galaxy. The targets are GRBs 061201, 090515, 091109B, 110112A, 130912A and 150423A.

Targets are to be observed with NIRCam. Observations will be taken in the long wavelength channel F322W2 filter, and the short wavelength channel F150W2 filter. Each target observation will consist of 2 integrations per exposure, with 5 groups per integration. 4 exposures per specification are requested, distributed in an INTRASCA Large 4-point dither pattern to maximise astrometric precision for our small (< 10") targets. We utilise module B and the full sub-array with a DEEP8 readout pattern to maximise sensitivity. The total exposure time per target is 7601.63s.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	GRB061201	RA: 22 08 32.0600 (332.1335833d) Dec: -74 34 47.90 (-74.57997d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow. *Category=Galaxy* *Description=[Compact galaxies]*				
(2)	GRB090515	RA: 10 56 41.0000 (164.1708333d) Dec: +14 27 22.00 (14.45611d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow. *Category=Galaxy* *Description=[Compact galaxies]*				
(3)	GRB091109B	RA: 07 30 59.9000 (112.7495833d) Dec: -54 05 30.60 (-54.09183d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow. *Category=Galaxy* *Description=[Compact galaxies]*				
(4)	GRB110112A	RA: 21 59 43.7500 (329.9322917d) Dec: +26 27 24.10 (26.45669d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow. *Category=Galaxy* *Description=[Compact galaxies]*				
(5)	GRB130912A	RA: 03 10 25.6000 (47.6066667d) Dec: +13 59 55.70 (13.99881d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow. Astrometric precision will be improved by combining available data on the source. *Category=Galaxy* *Description=[Compact galaxies]*				
(6)	GRB150423A	RA: 14 46 18.9600 (221.5790000d) Dec: +12 17 0.60 (12.28350d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow. *Category=Galaxy* *Description=[Compact galaxies]*				

Observation

Proposal 3134, Observation 1: 061201

Tue Oct 10 23:00:24 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 1:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	GRB061201	RA: 22 08 32.0600 (332.1335833d) Dec: -74 34 47.90 (-74.57997d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow.
Category=Galaxy
Description=[Compact galaxies]

Template

Module	Subarray	Target Placement
B	FULL	Module Gap

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRASCA	4	STANDARD	24" (LARGE)	1

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F150W2	F322W2	MEDIUM8	9	2	8	4	7601.633	144251

Special Requirements

Group Visits within 53.0 Days
Visits Same PA

Observation

Proposal 3134, Observation 2: 090515

Tue Oct 10 23:00:24 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 2:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 2:3) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 2:4) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	GRB090515	RA: 10 56 41.0000 (164.1708333d) Dec: +14 27 22.00 (14.45611d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow.
Category=Galaxy
Description=[Compact galaxies]

Template

Module	Subarray	Target Placement
B	FULL	Module Gap

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRASCA	4	STANDARD	24" (LARGE)	1

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F150W2	F322W2	MEDIUM8	9	2	8	4	7601.633	144251

Special Requirements

Group Visits within 53.0 Days
Visits Same PA

Observation

Proposal 3134, Observation 3: 091109B

Tue Oct 10 23:00:24 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 3:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(3)	GRB091109B	RA: 07 30 59.9000 (112.7495833d) Dec: -54 05 30.60 (-54.09183d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow.
Category=Galaxy
Description=[Compact galaxies]

Template

Module	Subarray	Target Placement
B	FULL	Module Gap

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRASCA	4	STANDARD	24" (LARGE)	1

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F150W2	F322W2	MEDIUM8	9	2	8	4	7601.633	144251

Special Requirements

Group Visits within 53.0 Days
Visits Same PA

Observation

Proposal 3134, Observation 4: 110112A

Tue Oct 10 23:00:24 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 4:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(4)	GRB110112A	RA: 21 59 43.7500 (329.9322917d) Dec: +26 27 24.10 (26.45669d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow.
Category=Galaxy
Description=[Compact galaxies]

Template

Module	Subarray	Target Placement
B	FULL	Module Gap

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRASCA	4	STANDARD	24" (LARGE)	1

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F150W2	F322W2	MEDIUM8	9	2	8	4	7601.633	144251

Special Requirements

Group Visits within 53.0 Days
Visits Same PA

Observation

Proposal 3134, Observation 5: 130912A Tue Oct 10 23:00:24 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 5:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(5)	GRB130912A	RA: 03 10 25.6000 (47.6066667d) Dec: +13 59 55.70 (13.99881d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow. Astrometric precision will be improved by combining available data on the source.
Category=Galaxy
Description=[Compact galaxies]

Template

Module	Subarray	Target Placement
B	FULL	Module Gap

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRASCA	4	STANDARD	24" (LARGE)	1

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F150W2	F322W2	MEDIUM8	9	2	8	4	7601.633	144251

Special Requirements

Group Visits within 53.0 Days
Visits Same PA

Observation

Proposal 3134, Observation 555: 130912A WOPR Tue Oct 10 23:00:24 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Comments: This is a WOPR of failed 5:1

Diagnostics

(Visit 555:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(5)	GRB130912A	RA: 03 10 25.6000 (47.6066667d) Dec: +13 59 55.70 (13.99881d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow. Astrometric precision will be improved by combining available data on the source.
Category=Galaxy
Description=[Compact galaxies]

Template

Module	Subarray	Target Placement
B	FULL	Module Gap

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRASCA	3	STANDARD	24" (LARGE)	1

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F150W2	F322W2	MEDIUM8	9	2	6	3	5701.225	144251

Observation

Proposal 3134, Observation 6: 150423A Tue Oct 10 23:00:24 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 6:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 6:3) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(6)	GRB150423A	RA: 14 46 18.9600 (221.5790000d) Dec: +12 17 0.60 (12.28350d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Given position is for the GRB afterglow.
Category=Galaxy
Description=[Compact galaxies]

Template

Module	Subarray	Target Placement
B	FULL	Module Gap

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRASCA	4	STANDARD	24" (LARGE)	1

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F150W2	F322W2	MEDIUM8	9	2	8	4	7601.633	144251

Special Requirements

Group Visits within 53.0 Days
Visits Same PA