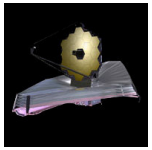

12569 - Are LFBOTs Dusty? Constraining the Nature of IR Emission in the Luminous Fast Blue Optical Transient AT2026dbl

Cycle: 4, Proposal Category: DD

INVESTIGATORS

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	1	NIRCAM Imaging	NIRCam Imaging	(1) AT2026dbl
Observation Folder				
	2	MIRI Imaging	MIRI Imaging	(1) AT2026dbl

ABSTRACT

Luminous Fast and Blue Optical Transients (LFBOTs) are a new class of relativistic transients. Their large peak luminosities and extremely fast evolution are inconsistent with expectations for standard stellar explosions. Alternative scenarios include strong shock interaction with a dense medium, or the presence of a central engine, for example in the form of an accreting black hole or neutron star. The third LFBOT NIR excess above optical blackbody emission was recently observed in the latest LFBOT AT2026dbl in ground-based NIR data. However, the key to distinguishing whether this IR excess is produced by dust sloughed off by the progenitor or due to free-free opacity effects in the transient's extended atmosphere lies in the MIR. Here we propose to obtain the first comprehensive NIR to MIR dataset for the third-ever NIR-sampled LFBOT with JWST, including the first MIR sampling. This study will have large implications for understanding the properties of LFBOT progenitors as neither IR emission mechanism is fully consistent with the CSM mass inferred from other wavelengths. JWST can uniquely constrain the properties of the progenitors of these exceptional objects by conclusively settling whether or not they are dusty.

OBSERVING DESCRIPTION

In this proposal we target a recently discovered luminous fast blue optical transient (LFBOT), AT2026dbl, during the next JWST observability window (late March to early May 2026) to obtain its NIR and MIR SED. These observations will constrain the IR excess emission mechanism by distinguishing whether it is caused by dust or free-free opacity effects in an extended medium. To do this, we use NIRCAM and MIRI imaging with filters spanning 1.5-14 um.

Specifically, for NIRCAM, we use the the F150W/F356W and F200W/F444W filter combinations and read out the FULL array with the SHALLOW4 pattern. For F150W/F356W, we use 5 groups, 1 integration per exposure, and 8 dithers and for the F200W/F444W combination, we use 2 groups, 1 integration per exposure, and 8 dithers. With MIRI, we do imaging in the F560W, F1000W, and F1280W filters each with 20 groups, 10 integrations per exposure, and one 4 point dither pattern to capture the full SED to 14m.

We have grouped the NIRCAM and MIRI observations and required them to be observed within 3 days of each other so that we obtain the SED of this rapidly fading source quasi-simultaneously.

In total, our request is 5.2 hours with overheads.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	AT2026dbl	RA: 09 01 17.3700 (135.3223750d) Dec: +18 36 7.75 (18.60215d) Equinox: J2000		

Comments:
Category=Star
Description=[Supernovae]

Observation

Proposal 12569, Observation 1: NIRCAM Imaging Wed Mar 18 20:00:47 GMT 2026

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	AT2026dbl	RA: 09 01 17.3700 (135.3223750d) Dec: +18 36 7.75 (18.60215d) Equinox: J2000		

Comments:
Category=Star
Description=[Supernovae]

Template

Module	Subarray
B	FULL

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRAMODULEX	8	STANDARD		1

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	Optional ETC ID
1	F150W	F356W	SHALLOW4	5	1	8	8	2061.46	293527
2	F200W	F444W	BRIGHT2	5	1	8	8	858.942	293527

Special Requirements

Between Dates 18-MAR-2026:00:00:00 and 26-APR-2026:00:00:00
Offset -25.0 arcsec, -25.0 arcsec

Group Observations 1, 2 within 3 Days

Observation

Proposal 12569, Observation 2: MIRI Imaging Wed Mar 18 20:00:47 GMT 2026

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	AT2026dbl	RA: 09 01 17.3700 (135.3223750d) Dec: +18 36 7.75 (18.60215d) Equinox: J2000		

Comments:
Category=Star
Description=[Supernovae]

Template

Subarray
FULL

Dithers

#	Dither Type	Starting Point	Number of Points	Points	Starting Set	Number of Sets	Optimized For	Direction	Pattern Size
1	CYCLING	5	4		1	1			LARGE

Spectral Elements

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
1	F560W	FASTR1	104	2	1	Dither 1	4	8	2319.933	293527
2	F1000W	FASTR1	104	2	1	Dither 1	4	8	2319.933	293527
3	F1280W	FASTR1	104	2	1	Dither 1	4	8	2319.933	293527

Special Requirements

Group Observations 1, 2 within 3 Days