



7230 - Shadows and Dust - MIREX Mapping of a Massive Molecular Filament

Cycle: 4, Proposal Category: GO

INVESTIGATORS

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OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
G35				
	1	NIRCAM 1 field	NIRCam Imaging	(3) G35
	2	MIRI mosaic	MIRI Imaging	(3) G35
	3	MIRI mosaic - BKG	MIRI Imaging	(4) G35-BKG

ABSTRACT

We propose MIRI and NIRCam imaging of a well-studied Infrared Dark Cloud (IRDC) filament that is one of the best test cases for mid infrared extinction (MIREX) mapping. This project will produce MIREX maps at <0.3 arcsecond resolution, eight times finer than achieved with Spitzer and a unique and powerful probe of the structure of star-forming clouds that only JWST can deliver. The NIR images will detect background stars, whose sight lines will yield pinpoint extinction measurements that help calibrate the MIREX map. Combined analysis of NIR and MIR extinctions will test models of dust grain evolution in a wide range of conditions in molecular gas. The same NIR and MIR images will also be exceptionally sensitive to protostellar and young stellar object (YSO) populations in the cloud, enabling a full characterization of the initial mass function (IMF) in this early-stage massive molecular filament. Key questions that will be answered by this project include:

- What are the structural properties of molecular gas at the onset of massive star and cluster formation?
- What are the natures of the young and forming stellar populations in this filamentary IRDC?
- What is the core mass function (CMF) in this region and how does it relate to the stellar initial mass function (IMF)?
- How does the NIR to MIR extinction law vary as a function of density and temperature and what are the implications for dust grain growth and evolution?

OBSERVING DESCRIPTION

This program will carry out NIRCam (F115W, F162M, F182M, F200W, F356W, F405N, F470N, F480M) and MIRI (F770W and F2100W) imaging of a filamentary Infrared Dark Cloud (IRDC) to carry out MIR extinction (MIREX) mapping, including NIR extinction calibration, and characterize its protostellar and YSO populations. Coordinated parallels are requested to improve modeling of the background diffuse MIR emission that is

crucial for MIREX mapping and to characterize the field star population in these wavebands, which is important for NIR extinction methods in the Galactic plane and for estimating on-source levels of field star contamination.

Proposal 7230 - Targets - Shadows and Dust - MIREX Mapping of a Massive Molecular Filament

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(3)	G35	RA: 18 57 8.0000 (284.2833333d) Dec: +02 10 10.00 (2.16944d) Equinox: J2000 <i>Comments:</i> <i>Category=ISM</i> <i>Description=[Dense interstellar clouds]</i>		
(4)	G35-BKG	RA: 18 58 31.0000 (284.6291667d) Dec: +02 21 36.00 (2.36000d) Equinox: J2000 <i>Comments:</i> <i>Category=ISM</i> <i>Description=[Dense interstellar clouds]</i>			

Proposal 7230 - Observation 1 - Shadows and Dust - MIREX Mapping of a Massive Molecular Filament

Thu Jan 29 21:00:12 GMT 2026

Observation	Proposal 7230, Observation 1: NIRCAM 1 field Diagnostic Status: Warning Observing Template: NIRCAM Imaging Coordinated Parallel Template(s): MIRI Imaging										
	(NIRCAM 1 field (Obs 1)) Warning (Form): By selecting Target Placement = Module Gap the target coordinates will not fall on any detector unless an appropriate Mosaic, set of Dithers or Offset Special Requirement is specified. (Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run. (Visit 1:1) Informational (Form): Visit schedulable, but most scheduling windows are when JWST is pointed in direction of greatest micrometeoroid impact risk. This is likely due to scheduling special requirements.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections		Miscellaneous			
	(3)	G35	RA: 18 57 8.0000 (284.2833333d) Dec: +02 10 10.00 (2.16944d) Equinox: J2000 <i>Comments:</i> <i>Category=ISM</i> <i>Description=[Dense interstellar clouds]</i>								
Template	NIRCAM Imaging					MIRI Imaging					
	Module: ALL Subarray: FULL Target Placement: Module gap (large extended source)					Subarray: FULL					
Dithers	#	Primary Dither Type		Primary Dithers	Dither Size	Subpixel Positions		Coordinated Parallel Subpixel Selector		Dither Direct Images Primes	
	1	FULLBOX		6		1		NIRCAM Only		NO_DITHERING	
Spectral Elements	NIRCAM Imaging	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	Optional ETC ID	
	1	F162M+F150W2	F405N+F444W	SHALLOW2	6	1	6	6	1739.357	145645	
	2	F182M	F470N+F444W	SHALLOW2	6	1	6	6	1739.357	145645	
	3	F115W	F480M	SHALLOW2	6	1	6	6	1739.357	145645	
	4	F200W	F356W	BRIGHT2	6	1	6	6	773.047	145645	
Spectral Elements	MIRI Imaging	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	F560W	FASTR1	10	1	1		6	6	166.502	
	2	F770W	FASTR1	10	1	1		6	6	166.502	
	3	F1500W	FASTR1	10	1	1		6	6	166.502	
	4	F2100W	FASTR1	10	1	1		6	6	166.502	

Proposal 7230 - Observation 1 - Shadows and Dust - MIREX Mapping of a Massive Molecular Filament

Special Requirements

Aperture PA Range 249.92542306 to 269.92542306 Degrees (V3 250.0 to 270.0)
No Parallel Attachments

Group Observations 1, 2, 3, Non-interruptible

Proposal 7230 - Observation 2 - Shadows and Dust - MIREX Mapping of a Massive Molecular Filament

Thu Jan 29 21:00:12 GMT 2026

Observation	Proposal 7230, Observation 2: MIRI mosaic Diagnostic Status: Warning Observing Template: MIRI Imaging Coordinated Parallel Template(s): 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. (Visit 2:1) Informational (Form): Visit schedulable, but most scheduling windows are when JWST is pointed in direction of greatest micrometeoroid impact risk. This is likely due to scheduling special requirements. (Visit 2:2) Informational (Form): Visit schedulable, but most scheduling windows are when JWST is pointed in direction of greatest micrometeoroid impact risk. This is likely due to scheduling special requirements. (Visit 2:3) Informational (Form): Visit schedulable, but most scheduling windows are when JWST is pointed in direction of greatest micrometeoroid impact risk. This is likely due to scheduling special requirements. (Visit 2:4) Informational (Form): Visit schedulable, but most scheduling windows are when JWST is pointed in direction of greatest micrometeoroid impact risk. This is likely due to scheduling special requirements.										
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections			Miscellaneous				
(3)	G35	RA: 18 57 8.0000 (284.2833333d) Dec: +02 10 10.00 (2.16944d) Equinox: J2000									
<i>Comments:</i> <i>Category=ISM</i> <i>Description=[Dense interstellar clouds]</i>											
Template	MIRI Imaging					NIRCam Imaging					
Subarray: FULL					Module: B Subarray: FULL						
Mosaic	Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order				
1	4	10.0	0.0	-1.429	0.0	DEFAULT					
Dithers	#	Dither Type	Starting Point	Number of Points	Points	Starting Set	Number of Sets	Optimized For	Direction	Pattern Size	
1	4-Point-Sets				1	1	POINT SOURCE	POSITIVE	DEFAULT		
Spectral Elements	MIRI Imaging	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
1	F770W	FASTR1	10	2	1	Dither 1	4	8	233.103	145666	
2	F2100W	FASTR1	10	2	1	Dither 1	4	8	233.103	145666	

Proposal 7230 - Observation 2 - Shadows and Dust - MIREX Mapping of a Massive Molecular Filament

Spectral Elements	NIRCam Imaging	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	Optional ETC ID	
	1		F150W	F470N+F444W	BRIGHT2	2	1	4	4	171.788	
	2		F200W	F356W	BRIGHT2	2	1	4	4	171.788	
Special Requirements	Group Visits within 53.0 Days Aperture PA Range 264.83544897 to 99.83544897 Degrees (V3 260.0 to 95.0) Visits Same PA No Parallel Attachments Group Observations 1, 2, 3, Non-interruptible										

Proposal 7230 - Observation 3 - Shadows and Dust - MIREX Mapping of a Massive Molecular Filament

Thu Jan 29 21:00:12 GMT 2026

Observation	Proposal 7230, Observation 3: MIRI mosaic - BKG Diagnostic Status: Warning Observing Template: MIRI Imaging Coordinated Parallel Template(s): NIRCam Imaging										
	(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections		Miscellaneous			
	(4)	G35-BKG	RA: 18 58 31.0000 (284.6291667d) Dec: +02 21 36.00 (2.36000d) Equinox: J2000								
<i>Comments:</i> <i>Category=ISM</i> <i>Description=[Dense interstellar clouds]</i>											
Template	MIRI Imaging					NIRCam Imaging					
	Subarray: FULL					Module: B Subarray: FULL					
Dithers	#	Dither Type	Starting Point	Number of Points	Points	Starting Set	Number of Sets	Optimized For	Direction	Pattern Size	
	1	4-Point-Sets				1	1	POINT SOURCE	POSITIVE	DEFAULT	
Spectral Elements	MIRI Imaging	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	F770W	FASTR1	10	2	1	Dither 1	4	8	233.103	
	2	F2100W	FASTR1	10	2	1	Dither 1	4	8	233.103	
Spectral Elements	NIRCam Imaging	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	Optional ETC ID	
	1	F150W	F470N+F444W	BRIGHT2	2	1	4	4	171.788		
	2	F200W	F356W	BRIGHT2	2	1	4	4	171.788		

Proposal 7230 - Observation 3 - Shadows and Dust - MIREX Mapping of a Massive Molecular Filament

Special Requirements

No Parallel Attachments

Group Observations 1, 2, 3, Non-interruptible