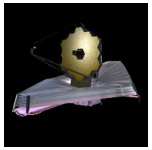

6625 - CAL-MIRI-446 MIRI Coronagraph Distortion and Boresight Offsets

Cycle: 3, Proposal Category: CAL/MIRI

INVESTIGATORS

Name	*Institution*
Dr. Jonathan Aguilar (PI)	**Space Telescope Science Institute**
Dr. Dean C. Hines (CoI)	Space Telescope Science Institute
Bryony Nickson (CoI)	Space Telescope Science Institute
Dr. Alberto Noriega-Crespo (CoI)	Space Telescope Science Institute
Dr. Greg Sloan (CoI)	Space Telescope Science Institute

OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Boresight offsets				
	1	Boresight offsets	MIRI External Flat	(1) NGC-5139

ABSTRACT

This program will measure the distortion and boresight offsets for all available filters in each coronagraph subarray. Improved understanding of the coronagraph distortion will help commission all remaining combinations of target-acquisition filter and quadrant, improve tracking of target acquisition trending, and improve distortion-corrected pipeline products.

This calibration program may change in response to system developments and the final Cycle 4 science program.

OBSERVING DESCRIPTION

This APT file is a placeholder for the final program and has been assembled using information currently available. The Cycle 3 JWST GO program 4343, which observes the same target wtih the MIRI imager in the F770W and F1500W filters, will be used to inform the final design of this program. Program 4343 is currently scheduled to execute in the summer, 2024. This program has been constrained so that no observations will be

obtained until the targets return to visibility in January, 2025.

We will observe globular cluster omega Cen with the MIRI External Flat template in order to select arbitrary combinations of filters and subarrays. Using the FULL array, we will hold the telescope in position while cycling through all the available target acquisition and coronagraph filters on MIRI. This includes the following filters: F560W, F1000W, F1500W, FND, F1065C, F1140C, F1550C, and F2300C.

Isolated point sources imaged in each filter will allow us to determine the pairwise boresight offsets between filters. During commissioning, it was discovered that these boresight offsets, which had been computed at the center of the full array, were so inaccurate at the position of the cornagraphs that stars were being shifted out of the nulling position. It is critical, then, that the measurement of the boresight offsets for each coronagraph and filter pair be made using sources located in that specific coronagraph.

Furthermore, comparing against high-precision astrometric catalogs of omega Cen will allow us to compute a general distortion solution for the coronagraphs. At the moment, the distortion solution is extrapolated from one derived for the Imager.

Proposal 6625 - Targets - CAL-MIRI-446 MIRI Coronagraph Distortion and Boresight Offsets

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	NGC-5139	RA: 13 26 47.6376 (201.6984900d) Dec: -47 28 42.08 (-47.47836d) Equinox: J2000	Proper Motion RA: -3.24 mas/yr Proper Motion Dec: -6.729999904564465 mas/yr Parallax: 1.93E-4" Epoch of Position: 2000	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Stellar Cluster
Description=[Globular star clusters]

Observation

Proposal 6625, Observation 1: Boresight offsets

Wed May 07 13:00:07 GMT 2025

Diagnostic Status: Warning

Observing Template: MIRI External Flat

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)	NGC-5139	RA: 13 26 47.6376 (201.6984900d)	Proper Motion RA: -3.24 mas/yr	
		Dec: -47 28 42.08 (-47.47836d)	Proper Motion Dec: -6.729999904564465 mas/yr	
		Equinox: J2000	Parallax: 1.93E-4"	
			Epoch of Position: 2000	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Stellar Cluster
Description=[Globular star clusters]

Template

Pointing Type	Detector	Dither	Lamp Use	Lamp On Time	Imager Subarray	Grating Wheel Direction
PRIME	IMAGER	false	OFF ONLY	0	FULL	Allow Auto Reorder

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
3	2	50.0	50.0	0.0	0.0	DEFAULT

Spectral Elements

#	Detector	Filter	Wavelength 1 & 4	Wavelength 2 & 3	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	IMAGER	F560W			FASTR1	10	5	1	1	5	149.852	
2	IMAGER	F1000W			FASTR1	15	10	1	1	10	441.231	
3	IMAGER	F1500W			FASTR1	25	12	1	1	12	863.037	
4	IMAGER	FND			FASTR1	25	8	1	1	8	574.433	
5	IMAGER	F1065C			FASTR1	25	10	1	1	10	718.735	
6	IMAGER	F1140C			FASTR1	25	10	1	1	10	718.735	
7	IMAGER	F1550C			FASTR1	25	10	1	1	10	718.735	
8	IMAGER	F2300C			FASTR1	25	10	1	1	10	718.735	

Special Requirements

After Date 01-SEP-2024
Group Visits within 53.0 Days
Visits Same PA
No Parallel Attachments