



12531 - CAL-MIRI-565 Wavelength Calibration for MIRI Wide Field Slitless Spectroscopy

Cycle: 5, Proposal Category: CAL/MIRI

INVESTIGATORS

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OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
Observation Folder				
	3		MIRI Wide Field Slitless Spectroscopy	(1) LHA-120-N-133

ABSTRACT

We aim to characterize the dispersion across the MIRI FOV by placing a wavelength calibrator at multiple locations on the detector and using the mosaic option.

This calibration program is provisional and may change in response to system developments and the final science program.

OBSERVING DESCRIPTION

OBJECTIVE: MIRI WFSS wavelength calibration across the entire field of view to characterize the flux calibration across the field of view.

JWST Proposal 12531 (Created: Tuesday, August 25, 2026, 5:00:26PM Eastern Standard Time) - Overview

METHOD: We will complement the wavelength calibration data with LRS slitless calibrator HD 76534, obtained as part of Cycle 4 program PID 9265. The HD 76534 data provided high signal-to-noise narrow emission lines at wavelengths longer than 7 micron, but only one low signal-to-noise line at 6.8.

In this proposed program, we request data for the MRS wavelength calibrator SMP LMC 058, as this target has also been used successfully as an LRS slit wavelength calibrator (Sloan et al., in prep.). Furthermore, we already have one pointing at the center of the detector, taken as part of the MIRI WFSS Science Verification program, PID 9505.

The number of requested positions is a compromise between minimizing the requested time and ensuring that we can identify any significant systematic variations across the detector. We also seek to obtain improved, systematic spectral trace information to complement archival observations.

JUSTIFICATION: Observations taken as part of the Cycle 4 WFSS calibration resulted in high signal-to-noise (>30) between 8 and 14 microns but were saturated between 6 and 8 microns, so we used the wings of the PSF to detect emission lines between 5 and 8 μm . The source proposed here did not saturate in the Science Verification observations.

These data will further assist us in identifying large-scale systematic structure in the flux sensitivity and in refining background subtraction and spectral extraction methods.

Setup justification: The most efficient method we identified to move the calibration source across the detector was to use a mosaic and apply an offset. We verified in APT that the source was at least 37 from the bottom of the detector and 10 from the top to ensure that the spectral traces remain fully on the detector. We used an i2d combined image from PID 9505 to identify eight possible contaminating targets and selected PAs to ensure there is no overlap.

We found that the WISE catalog contains more sources with WISE-3 magnitudes brighter than 13.5, but ultimately decided to consider only the sources detected in the F560W direct images associated with PID 9505.

Time restriction justification: We restrict the observations to a particular PA to avoid overlapping spectral sources. We use a time range instead of a PA constraint to ensure that the observations are scheduled as soon as possible, allowing the data to be available for modifications to the reference

files for Build 13.2. While we hoped archival data could play a significant role in the wavelength calibration, we found that a full field-of-view characterization requires well-observed sources that do not saturate at wavelengths shorter than 7.5 μm . The target proposed here is also an MRS calibration target, providing a benchmark for both wavelength and flux calibration.

With the nine-point mosaic, we will obtain 9×4 (4 point dither will be performed at each position) = 36 source locations, doubling the number spectral trace calibration measurements available to derive a SpecWCS reference file for Build 13.2.

Proposal 12531 - Targets - CAL-MIRI-565 Wavelength Calibration for MIRI Wide Field Slitless Spectroscopy

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	LHA-120-N-133	RA: 05 24 20.7552 (81.0864800d) Dec: -70 05 1.60 (-70.08378d) Equinox: J2000	Proper Motion RA: 1.767 mas/yr Proper Motion Dec: 0.245 mas/yr Epoch of Position: 2000	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM. Category=Calibration Description=[Line spread function, Planetary nebulae] Extended=YES					

Proposal 12531 - Observation 3 - CAL-MIRI-565 Wavelength Calibration for MIRI Wide Field Slitless Spectroscopy

Observation	Proposal 12531, Observation 3											Tue Aug 25 22:00:26 GMT 2026
	Diagnostic Status: Warning											
	Observing Template: MIRI Wide Field Slitless Spectroscopy											
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.											
	(Visit 3:3) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Fixed Targets	#	Name	Target Coordinates				Targ. Coord. Corrections			Miscellaneous		
	(1)	LHA-120-N-133	RA: 05 24 20.7552 (81.0864800d)				Proper Motion RA: 1.767 mas/yr					
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			Equinox: J2000				Epoch of Position: 2000					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.											
	SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM. Category=Calibration Description=[Line spread function, Planetary nebulae] Extended=YES											
Mosaic	Rows	Columns	Row Overlap %		Column Overlap %		Row shift (deg)		Column shift (deg)		Tile Order	
	3	3	72.0		75.0		0.0		0.0		DEFAULT	
Dithers	#	Dither Type				Starting Point		Number of Points			Pattern Size	
	1	CYCLING				1		4			DEFAULT	
Direct Image	#	Exposure Type	Filter	Disperser	Readout Pattern	Groups/Int	Integrations/Exp	Two Extra Dithers	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	DIRECT	F770W		FASTR1	5	3	NO	1	3	47.176	
	2	DIRECT	F770W		FASTR1	5	3	NO	1	3	47.176	
Spectral Elements	#	Exposure Type	Filter	Disperser	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID	
	1	WFSS		P750L	FASTR1	6	30	4	120	2319.933		

Proposal 12531 - Observation 3 - CAL-MIRI-565 Wavelength Calibration for MIRI Wide Field Slitless Spectroscopy

Special Requirements	Before Date 09-OCT-2026:00:00:00 Group Visits within 53.0 Days Aperture PA Range 244.83544897 to 294.83544897 Degrees (V3 240.0 to 290.0) Visits Same PA Offset 0.0 arcsec, 3.0 arcsec
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