



## 10749 - A red follow-up for the MIRI/MRS Library

Cycle: 5, Proposal Category: GO

### INVESTIGATORS

<i>Name</i>	<i>Institution</i>
<b>Dr. Danny Gasman (PI) (ESA Member)</b>	<b>Max Planck Institute for Astronomy</b>
Dr. Ioannis Argyriou (CoI) (ESA Member)	Institute of Astronomy, KU Leuven
Dr. David R. Law (CoI) (US Admin CoI)	Space Telescope Science Institute
Dr. Kirsten L. Larson (CoI)	Space Telescope Science Institute
Dr. Kate Rowlands (CoI) (ESA Member)	Space Telescope Science Institute - ESA - JWST
Dr. Jeroen Bouwman (CoI) (ESA Member)	Max Planck Institute for Astronomy
Dr. Roy van Boekel (CoI) (ESA Member)	Max Planck Institute for Astronomy

### OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
Observation Folder				
	1	Rosa bkg SHORT	MIRI Medium Resolution Spectroscopy	(4) 223-Rosa_bkg
	2	Rosa SHORT	MIRI Medium Resolution Spectroscopy	(3) 223-Rosa
	3	Rosa bkg MEDIUM	MIRI Medium Resolution Spectroscopy	(4) 223-Rosa_bkg
	4	Rosa MEDIUM	MIRI Medium Resolution Spectroscopy	(3) 223-Rosa
	5	Rosa bkg LONG	MIRI Medium Resolution Spectroscopy	(4) 223-Rosa_bkg
	6	Rosa LONG	MIRI Medium Resolution Spectroscopy	(3) 223-Rosa

### ABSTRACT

This program is a follow-up to PID 3779: 'The MIRI MRS library'. All MIRI data are strongly affected by unwanted detector effects, the two most prominent being migration of charge and fringing. The previous program was designed to address the need for high spectroscopic fidelity in the mid-infrared, focusing on the short wavelength detector of MIRI/MRS. The results demonstrated that this method works very well for characterizing and

calibrating the detector systematics. To calibrate the same systematics for the long wavelength detector of MIRI, we propose a follow-up with a target that is bright in the longer wavelengths of MIRI. Similarly to PID 3779, the goal is to derive pointing-specific calibration solutions for spatially unresolved (point) sources. These solutions include pointing-specific: detector pixel non-linearity, fringe flats, spectrophotometric correction files, and detector-based point spread functions (PSFs). This calibration program will reduce these persisting issues to similar sub-percent level residuals as PID 3779 did, but for long wavelength detector (~12-28 micron) instead.

### **OBSERVING DESCRIPTION**

We propose to perform a 9-point raster scan around every nominal point source dither position of MIRI/MRS, on the red source 223-Rosa. To reach the desired sampling of around 15% of a pixel in channels 3 and 4 (around 45 mas), we set a mosaic overlap of 98.6%. We derive fringing and non-linearity reference files by covering the highest possible dynamic range on the long wavelength detector pixels in all sub-bands. To do so, we observe the sub-bands for 80, 84, and 84 groups. We add dedicated backgrounds with the same set-up. For pointing accuracy, target acquisition on-source is added in the FND filter.

Proposal 10749 - Targets - A red follow-up for the MIRI/MRS Library

Solar System Targets	#	Name	Level 1	Level 2	Level 3
	(3)	223-Rosa	TYPE=ASTEROID,A=3.096352345042841,E=0.1160 535706903648,I=1.935425271748406 .O=47.93139497459337,W=61.63460265006434,M=2 27.8909586864576,EQUINOX=J2000,EPOCH=06- MAY-2015:00:00:00,EpochTimeScale=TDB		
(4)	223-Rosa_bkg	TYPE=ASTEROID,A=3.096352345042841,E=0.1160 535706903648,I=1.935425271748406 .O=47.93139497459337,W=61.63460265006434,M=2 27.8909586864576,EQUINOX=J2000,EPOCH=06- MAY-2015:00:00:00,EpochTimeScale=TDB		TYPE=POS_ANGLE,RAD=10,ANG=245,REF=NOR TH	<i>Comments: Extended=YES</i>

Proposal 10749 - Observation 1 - A red follow-up for the MIRI/MRS Library

Mon Mar 16 22:00:23 GMT 2026

<b>Observation</b>	<b>Proposal 10749, Observation 1: Rosa bkg SHORT</b> <b>Diagnostic Status: Warning</b> Observing Template: MIRI Medium Resolution Spectroscopy Background Observation For: [Rosa SHORT (Obs 2)]												
	(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run. (Rosa bkg SHORT (Obs 1)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.												
<b>Diagnosics</b>													
<b>Solar System Targets</b>	<b>#</b>	<b>Name</b>	<b>Level 1</b>				<b>Level 2</b>				<b>Level 3</b>		
	(4)	223-Rosa_bkg	TYPE=ASTEROID,A=3.096352345042841,E=0.1160 535706903648,I=1.935425271748406 ,O=47.93139497459337,W=61.63460265006434,M=2 27.8909586864576,EQUINOX=J2000,EPOCH=06- MAY-2015:00:00:00,EpochTimeScale=TDB				TYPE=POS_ANGLE,RAD=10,ANG=245,REF=NOR TH						
<i>Comments: Extended=YES</i>													
<b>Acquisition</b>	<b>#</b>	<b>Target</b>											
	1	NONE											
<b>Template</b>	<b>AcqFilter</b>	<b>Primary Channel</b>			<b>Simultaneous Imaging</b>			<b>Imager Subarray</b>		<b>Grating Wheel Direction</b>			
		All MRS			NO			FULL		Allow Auto Reorder			
<b>Dithers</b>	<b>#</b>	<b>Dither Type</b>				<b>Optimized For</b>				<b>Direction</b>			
	1	2-Point				BACKGROUND				NEGATIVE			
<b>Spectral Elements</b>	<b>#</b>	<b>Wavelength Range</b>	<b>Detector</b>	<b>Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/E xp</b>	<b>Exposures/Dit h</b>	<b>Dither</b>	<b>Total Dithers</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>
	1	SHORT(A)	MRSLONG		FASTR1	80	1	1	Dither 1	2	2	444.006	
	1	SHORT(A)	MRSSHORT		FASTR1	80	1	1	Dither 1	2	2	444.006	

Proposal 10749 - Observation 1 - A red follow-up for the MIRI/MRS Library

Special Requirements

Sequence Observations 1, 2, Non-interruptible

DEFAULT WINDOW: ANGULAR RATE 223-Rosa\_bkg FROM JWST LESS THAN 0.075

Proposal 10749 - Observation 2 - A red follow-up for the MIRI/MRS Library

Mon Mar 16 22:00:23 GMT 2026

<b>Observation</b>	<b>Proposal 10749, Observation 2: Rosa SHORT</b> <b>Diagnostic Status: Warning</b> Observing Template: MIRI Medium Resolution Spectroscopy Background Observations:[Rosa bkg SHORT (Obs 1)]												
	(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run. (Rosa SHORT (Obs 2)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.												
<b>Solar System Targets</b>	<b>#</b>	<b>Name</b>	<b>Level 1</b>				<b>Level 2</b>				<b>Level 3</b>		
	(3)	223-Rosa	TYPE=ASTEROID,A=3.096352345042841,E=0.1160 535706903648,I=1.935425271748406 ,O=47.93139497459337,W=61.63460265006434,M=2 27.8909586864576,EQUINOX=J2000,EPOCH=06- MAY-2015:00:00:00,EpochTimeScale=TDB  <i>Comments: Extended=NO</i>										
<b>Acquisition</b>	<b>#</b>	<b>Target</b>	<b>Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/Exp</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>				
	1	SAME	FND	FAST	4	1	1	11.1	267182				
<b>Template</b>	<b>Primary Channel</b>			<b>Simultaneous Imaging</b>			<b>Imager Subarray</b>			<b>Grating Wheel Direction</b>			
	All MRS			NO			FULL			Allow Auto Reorder			
<b>Mosaic</b>	<b>Rows</b>	<b>Columns</b>	<b>Row Overlap %</b>		<b>Column Overlap %</b>		<b>Row shift (deg)</b>		<b>Column shift (deg)</b>		<b>Tile Order</b>		
	3	3	98.6		98.6		0.0		0.0		DEFAULT		
<b>Dithers</b>	<b>#</b>	<b>Dither Type</b>				<b>Optimized For</b>				<b>Direction</b>			
	1	4-Point				POINT SOURCE				NEGATIVE			
	2	4-Point				POINT SOURCE				POSITIVE			
<b>Spectral Elements</b>	<b>#</b>	<b>Wavelength Range</b>	<b>Detector</b>	<b>Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/Exp</b>	<b>Exposures/Dith</b>	<b>Dither</b>	<b>Total Dithers</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>
	1	SHORT(A)	MRSLONG		FASTR1	80	1	1	Dither 1	4	4	888.013	267182
	1	SHORT(A)	MRSSHORT		FASTR1	80	1	1	Dither 1	4	4	888.013	267182
	2	SHORT(A)	MRSLONG		FASTR1	80	1	1	Dither 2	4	4	888.013	267182
	2	SHORT(A)	MRSSHORT		FASTR1	80	1	1	Dither 2	4	4	888.013	267182

Proposal 10749 - Observation 2 - A red follow-up for the MIRI/MRS Library

Special Requirements

Sequence Observations 1, 2, Non-interruptible

DEFAULT WINDOW: ANGULAR RATE 223-Rosa FROM JWST LESS THAN 0.075

Proposal 10749 - Observation 3 - A red follow-up for the MIRI/MRS Library

Mon Mar 16 22:00:23 GMT 2026

<b>Observation</b>	<b>Proposal 10749, Observation 3: Rosa bkg MEDIUM</b> <b>Diagnostic Status: Warning</b> Observing Template: MIRI Medium Resolution Spectroscopy Background Observation For: [Rosa MEDIUM (Obs 4)]												
	(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run. (Rosa bkg MEDIUM (Obs 3)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.												
<b>Diagnostics</b>													
<b>Solar System Targets</b>	<b>#</b>	<b>Name</b>	<b>Level 1</b>				<b>Level 2</b>				<b>Level 3</b>		
	(4)	223-Rosa_bkg	TYPE=ASTEROID,A=3.096352345042841,E=0.1160 535706903648,I=1.935425271748406 ,O=47.93139497459337,W=61.63460265006434,M=2 27.8909586864576,EQUINOX=J2000,EPOCH=06- MAY-2015:00:00:00,EpochTimeScale=TDB				TYPE=POS_ANGLE,RAD=10,ANG=245,REF=NOR TH						
Comments: Extended=YES													
<b>Acquisition</b>	<b>#</b>											<b>Target</b>	
	1											NONE	
<b>Template</b>	<b>AcqFilter</b>	<b>Primary Channel</b>			<b>Simultaneous Imaging</b>			<b>Imager Subarray</b>		<b>Grating Wheel Direction</b>			
		All MRS			NO			FULL		Allow Auto Reorder			
<b>Dithers</b>	<b>#</b>	<b>Dither Type</b>				<b>Optimized For</b>				<b>Direction</b>			
	1	2-Point				BACKGROUND				NEGATIVE			
<b>Spectral Elements</b>	<b>#</b>	<b>Wavelength Range</b>	<b>Detector</b>	<b>Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/E xp</b>	<b>Exposures/Dit h</b>	<b>Dither</b>	<b>Total Dithers</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>
	1	MEDIUM(B)	MRSLONG		FASTR1	84	1	1	Dither 1	2	2	466.207	
	1	MEDIUM(B)	MRSSHORT		FASTR1	84	1	1	Dither 1	2	2	466.207	

## Proposal 10749 - Observation 3 - A red follow-up for the MIRI/MRS Library

### Special Requirements

Sequence Observations 3, 4, Non-interruptible

DEFAULT WINDOW: ANGULAR RATE 223-Rosa\_bkg FROM JWST LESS THAN 0.075

Proposal 10749 - Observation 4 - A red follow-up for the MIRI/MRS Library

Mon Mar 16 22:00:23 GMT 2026

<b>Observation</b>	<b>Proposal 10749, Observation 4: Rosa MEDIUM</b> <b>Diagnostic Status: Warning</b> Observing Template: MIRI Medium Resolution Spectroscopy Background Observations:[Rosa bkg MEDIUM (Obs 3)]												
	(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run. (Rosa MEDIUM (Obs 4)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.												
<b>Solar System Targets</b>	<b>#</b>	<b>Name</b>	<b>Level 1</b>				<b>Level 2</b>				<b>Level 3</b>		
	(3)	223-Rosa	TYPE=ASTEROID,A=3.096352345042841,E=0.1160 535706903648,I=1.935425271748406 ,O=47.93139497459337,W=61.63460265006434,M=2 27.8909586864576,EQUINOX=J2000,EPOCH=06- MAY-2015:00:00:00,EpochTimeScale=TDB Comments: Extended=NO										
<b>Acquisition</b>	<b>#</b>	<b>Target</b>	<b>Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/Exp</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>				
	1	SAME	FND	FAST	4	1	1	11.1	267182				
<b>Template</b>	<b>Primary Channel</b>			<b>Simultaneous Imaging</b>			<b>Imager Subarray</b>			<b>Grating Wheel Direction</b>			
	All MRS			NO			FULL			Allow Auto Reorder			
<b>Mosaic</b>	<b>Rows</b>	<b>Columns</b>	<b>Row Overlap %</b>		<b>Column Overlap %</b>		<b>Row shift (deg)</b>		<b>Column shift (deg)</b>		<b>Tile Order</b>		
	3	3	98.6		98.6		0.0		0.0		DEFAULT		
<b>Dithers</b>	<b>#</b>	<b>Dither Type</b>				<b>Optimized For</b>				<b>Direction</b>			
	1	4-Point				POINT SOURCE				NEGATIVE			
	2	4-Point				POINT SOURCE				POSITIVE			
<b>Spectral Elements</b>	<b>#</b>	<b>Wavelength Range</b>	<b>Detector</b>	<b>Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/Exp</b>	<b>Exposures/Dith</b>	<b>Dither</b>	<b>Total Dithers</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>
	1	MEDIUM(B)	MRSLONG		FASTR1	84	1	1	Dither 1	4	4	932.413	267182
	1	MEDIUM(B)	MRSSHORT		FASTR1	84	1	1	Dither 1	4	4	932.413	267182
	2	MEDIUM(B)	MRSLONG		FASTR1	84	1	1	Dither 2	4	4	932.413	267182
	2	MEDIUM(B)	MRSSHORT		FASTR1	84	1	1	Dither 2	4	4	932.413	267182

Proposal 10749 - Observation 4 - A red follow-up for the MIRI/MRS Library

Special Requirements

Sequence Observations 3, 4, Non-interruptible

DEFAULT WINDOW: ANGULAR RATE 223-Rosa FROM JWST LESS THAN 0.075

Proposal 10749 - Observation 5 - A red follow-up for the MIRI/MRS Library

Mon Mar 16 22:00:23 GMT 2026

<b>Observation</b>	<b>Proposal 10749, Observation 5: Rosa bkg LONG</b> <b>Diagnostic Status: Warning</b> Observing Template: MIRI Medium Resolution Spectroscopy Background Observation For: [Rosa LONG (Obs 6)]												
	(Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run. (Rosa bkg LONG (Obs 5)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.												
<b>Diagnostics</b>													
<b>Solar System Targets</b>	<b>#</b>	<b>Name</b>	<b>Level 1</b>				<b>Level 2</b>				<b>Level 3</b>		
	(4)	223-Rosa_bkg	TYPE=ASTEROID,A=3.096352345042841,E=0.1160 535706903648,I=1.935425271748406 ,O=47.93139497459337,W=61.63460265006434,M=2 27.8909586864576,EQUINOX=J2000,EPOCH=06- MAY-2015:00:00:00,EpochTimeScale=TDB				TYPE=POS_ANGLE,RAD=10,ANG=245,REF=NOR TH						
<i>Comments: Extended=YES</i>													
<b>Acquisition</b>	<b>#</b>											<b>Target</b>	
	1											NONE	
<b>Template</b>	<b>AcqFilter</b>	<b>Primary Channel</b>			<b>Simultaneous Imaging</b>			<b>Imager Subarray</b>		<b>Grating Wheel Direction</b>			
		All MRS			NO			FULL		Allow Auto Reorder			
<b>Dithers</b>	<b>#</b>	<b>Dither Type</b>				<b>Optimized For</b>				<b>Direction</b>			
	1	2-Point				BACKGROUND				NEGATIVE			
<b>Spectral Elements</b>	<b>#</b>	<b>Wavelength Range</b>	<b>Detector</b>	<b>Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/E xp</b>	<b>Exposures/Dit h</b>	<b>Dither</b>	<b>Total Dithers</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>
	1	LONG(C)	MRSLONG		FASTR1	84	1	1	Dither 1	2	2	466.207	
	1	LONG(C)	MRSSHORT		FASTR1	84	1	1	Dither 1	2	2	466.207	

Proposal 10749 - Observation 5 - A red follow-up for the MIRI/MRS Library

Special Requirements

Sequence Observations 5, 6, Non-interruptible

DEFAULT WINDOW: ANGULAR RATE 223-Rosa\_bkg FROM JWST LESS THAN 0.075

Proposal 10749 - Observation 6 - A red follow-up for the MIRI/MRS Library

Mon Mar 16 22:00:23 GMT 2026

<b>Observation</b>	<b>Proposal 10749, Observation 6: Rosa LONG</b> <b>Diagnostic Status: Warning</b> Observing Template: MIRI Medium Resolution Spectroscopy Background Observations:[Rosa bkg LONG (Obs 5)]												
	(Visit 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run. (Rosa LONG (Obs 6)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.												
<b>Solar System Targets</b>	<b>#</b>	<b>Name</b>	<b>Level 1</b>				<b>Level 2</b>				<b>Level 3</b>		
	(3)	223-Rosa	TYPE=ASTEROID,A=3.096352345042841,E=0.1160 535706903648,I=1.935425271748406 ,O=47.93139497459337,W=61.63460265006434,M=2 27.8909586864576,EQUINOX=J2000,EPOCH=06- MAY-2015:00:00:00,EpochTimeScale=TDB  <i>Comments: Extended=NO</i>										
<b>Acquisition</b>	<b>#</b>	<b>Target</b>	<b>Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/Exp</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>				
	1	SAME	FND	FAST	4	1	1	11.1	267182				
<b>Template</b>	<b>Primary Channel</b>			<b>Simultaneous Imaging</b>			<b>Imager Subarray</b>			<b>Grating Wheel Direction</b>			
	All MRS			NO			FULL			Allow Auto Reorder			
<b>Mosaic</b>	<b>Rows</b>	<b>Columns</b>	<b>Row Overlap %</b>		<b>Column Overlap %</b>		<b>Row shift (deg)</b>		<b>Column shift (deg)</b>		<b>Tile Order</b>		
	3	3	98.6		98.6		0.0		0.0		DEFAULT		
<b>Dithers</b>	<b>#</b>	<b>Dither Type</b>				<b>Optimized For</b>				<b>Direction</b>			
	1	4-Point				POINT SOURCE				NEGATIVE			
	2	4-Point				POINT SOURCE				POSITIVE			
<b>Spectral Elements</b>	<b>#</b>	<b>Wavelength Range</b>	<b>Detector</b>	<b>Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/Exp</b>	<b>Exposures/Dith</b>	<b>Dither</b>	<b>Total Dithers</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>
	1	LONG(C)	MRSLONG		FASTR1	84	1	1	Dither 1	4	4	932.413	267182
	1	LONG(C)	MRSSHORT		FASTR1	84	1	1	Dither 1	4	4	932.413	267182
	2	LONG(C)	MRSLONG		FASTR1	84	1	1	Dither 2	4	4	932.413	267182
	2	LONG(C)	MRSSHORT		FASTR1	84	1	1	Dither 2	4	4	932.413	267182

Proposal 10749 - Observation 6 - A red follow-up for the MIRI/MRS Library

Special Requirements

Sequence Observations 5, 6, Non-interruptible

DEFAULT WINDOW: ANGULAR RATE 223-Rosa FROM JWST LESS THAN 0.075