



9287 - NIRISS WFSS Cy 4 Wavelength Calibration Verification, Monitoring, and Refinement

Cycle: 4, Proposal Category: CAL/NIRISS

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
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OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
Wavelength Mosaic				
	1	All W filters; 2 dithers; 3x3	NIRISS Wide Field Slitless Spectroscopy	(1) SMP-LMC-58

ABSTRACT

This program aims to further investigate the behavior of the NIRISS wide field slitless (WFSS) mode's wavelength calibration. A JWST Cycle 1 NIRISS calibration program observed the planetary nebula SMP LMC 58 at nine distinct locations which allowed us to characterize the spatial dependence of the wavelength calibration. This new program aims to leverage that data as well as data observed during commissioning of the planetary nebula to accomplish three goals: 1) Determine if there is any time dependence of the wavelength calibration due to changes in NIRISS detector or grism optics, 2) Obtain additional wavelength calibration measurements at new locations closer to the edges of the detector to verify the current wavelength calibration, and 3) Use the new position data to determine if the spatial dependence of the wavelength calibration improves significantly with additional data points.

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

OBSERVING DESCRIPTION

This program is an expansion of the initial NIRISS WFSS wavelength calibration observations in commissioning (PID 1090) and in Cycle 1 (PID 1510). In this program we will observe the planetary nebula, SMP LMC 58. This planetary nebula is in the continuous viewing zone and provides a spectrum with narrow emission lines for the wavelength calibration of the spectra. The nebula is very small, although not quite a point source for JWST, so the line measurements are accurate and not affected by the nebular morphology. We will observe the nebula in a 3 by 3 grid with a 70% overlap with both GR150C and GR150R crossed with the available NIRISS/WFSS wide-band filters (F090W, F115W, F150W, F200W). This is a 5% change of overlap compared to the Cycle 1 wavelength calibration program, although the center pointing location will remain the same as PID 1510. We will be obtaining 2 dither positions to protect against cosmic rays and bad pixels given the limited number of emission lines in the short NIRISS traces. A 70% overlap allows us to still obtain order 1 spectra for both grisms in all cross filters, although we will not obtain order 2 spectra for F200W. We are observing with GRISM=GR150C and GRISM=GR150R rather than GRISM=BOTH to remove the ~100 pixel offset introduced while using the WFSS APT template between filters.

Proposal 9287 - Targets - NIRISS WFSS Cy 4 Wavelength Calibration Verification, Monitoring, and Refinement

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	SMP-LMC-58	RA: 05 24 20.7650 (81.0865208d) Dec: -70 05 1.52 (-70.08376d) Equinox: J2000		
	<i>Comments: The object is very small but not a point source. The core FWHM is estimated to be 0.04 arc-seconds.</i> Category=Calibration Description=[Planetary nebulae] Extended=YES				

Proposal 9287 - Observation 1 - NIRISS WFSS Cy 4 Wavelength Calibration Verification, Monitoring, and Refinement

Observation	Proposal 9287, Observation 1: All W filters; 2 dithers; 3x3											Fri Mar 14 15:00:32 GMT 2025
	Diagnostic Status: Warning											
	Observing Template: NIRISS Wide Field Slitless Spectroscopy											
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.											
	(Visit 1:3) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
	(Visit 1:4) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
	(Visit 1:5) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Fixed Targets	#	Name	Target Coordinates				Targ. Coord. Corrections			Miscellaneous		
	(1)	SMP-LMC-58	RA: 05 24 20.7650 (81.0865208d) Dec: -70 05 1.52 (-70.08376d) Equinox: J2000									
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	Category=Calibration Description=[Planetary nebulae] Extended=YES											
Mosaic	Rows	Columns	Row Overlap %		Column Overlap %		Row shift (deg)		Column shift (deg)		Tile Order	
	3	3	70.0		70.0		0.0		0.0		HILBERT_CURVE	
Dithers	#	Image Dithers						Pattern Size				
	1	2						MEDIUM				
Direct Image	#	Exposure Type	Filter	Grism	Readout Pattern	Groups/Int	Integrations/Exp	Two Extra Dithers	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	DIRECT	F090W		NISRAPID	5	1	NO	1	1	64.421	
	2	DIRECT	F090W		NISRAPID	5	1	NO	1	1	64.421	
	3	DIRECT	F090W		NISRAPID	5	1	NO	1	1	64.421	
	4	DIRECT	F090W		NISRAPID	5	1	NO	1	1	64.421	
	5	DIRECT	F115W		NISRAPID	5	1	NO	1	1	64.421	
	6	DIRECT	F115W		NISRAPID	5	1	NO	1	1	64.421	
	7	DIRECT	F115W		NISRAPID	5	1	NO	1	1	64.421	
	8	DIRECT	F115W		NISRAPID	5	1	NO	1	1	64.421	
	9	DIRECT	F150W		NISRAPID	5	1	NO	1	1	64.421	
	10	DIRECT	F150W		NISRAPID	5	1	NO	1	1	64.421	
	11	DIRECT	F150W		NISRAPID	5	1	NO	1	1	64.421	
	12	DIRECT	F150W		NISRAPID	5	1	NO	1	1	64.421	
	13	DIRECT	F200W		NISRAPID	5	1	NO	1	1	64.421	
	14	DIRECT	F200W		NISRAPID	5	1	NO	1	1	64.421	
	15	DIRECT	F200W		NISRAPID	5	1	NO	1	1	64.421	
	16	DIRECT	F200W		NISRAPID	5	1	NO	1	1	64.421	

Proposal 9287 - Observation 1 - NIRISS WFSS Cy 4 Wavelength Calibration Verification, Monitoring, and Refinement

Spectral Elements	#	Exposure Type	Filter	Grism	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	GRISM	F090W	GR150R	NISRAPID	3	4	2	8	343.577	
	2	GRISM	F090W	GR150C	NISRAPID	3	4	2	8	343.577	
	3	GRISM	F115W	GR150R	NISRAPID	5	2	2	4	257.682	
	4	GRISM	F115W	GR150C	NISRAPID	5	2	2	4	257.682	
	5	GRISM	F150W	GR150R	NISRAPID	10	1	2	2	236.209	
	6	GRISM	F150W	GR150C	NISRAPID	10	1	2	2	236.209	
	7	GRISM	F200W	GR150R	NISRAPID	2	5	2	10	322.103	
	8	GRISM	F200W	GR150C	NISRAPID	2	5	2	10	322.103	
Special Requirements	Group Visits within 53.0 Days Visits Same PA										