



9448 - An accretion burst in a planetary mass objects: DDT observations of Cha1107-7626

Cycle: 4, Proposal Category: DD

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				
	1	NIRSPEC_epoch1	NIRSpec Fixed Slit Spectroscopy	(1) CHA1107-7626
	3	NIRSPEC_epoch2	NIRSpec Fixed Slit Spectroscopy	(1) CHA1107-7626
	4	NIRSPEC_epoch3	NIRSpec Fixed Slit Spectroscopy	(1) CHA1107-7626
	2	MIRI_epoch1	MIRI Low Resolution Spectroscopy	(1) CHA1107-7626

ABSTRACT

Recent published observations with VLT and JWST have established Cha1107-7626 as a prototype of an isolated planetary-mass object with ongoing accretion and a carbon-rich disk. Over the last months, several epochs of VLT/XSHOOTER spectra have been collected. The last epochs from June

and July 2025 shows a dramatic increase in the width and strength of accretion-related lines, indicating an ongoing accretion burst - for the first time observed in an object with a mass in the planetary domain. In addition, there is a clear asymmetric double-peaked H α profile. This is a breakthrough discovery that needs verification and monitoring. Here we propose to obtain several epochs of infrared spectroscopy with JWST, to track the evolution of the accretion burst, to measure the extent of the mass accretion rate changes, and to evaluate the impact of the event on the disk.

OBSERVING DESCRIPTION

We ask for three epochs of NIRSPEC data, and one epoch of MIRI spectroscopy, to track the evolution of an accretion burst detected in emission lines in the planetary-mass object Cha1107-7626.

With NIRSPEC, we plan to observe with 3 setups, PRISM to track the continuum and H α , plus two high-resolution grisms to track the accretion-related Paschen and Brackett lines. With MIRI, we ask for LRS data, to probe the silicate feature. The precise setup follows previous successful programs for this target or for targets with similar characteristics.

The program requires several time constraints. One, the current visibility window ends on August 31, which means the program needs to be completed at that point. Second, the MIRI visit should be grouped with the first NIRSPEC visit. And third, the NIRSPEC visits need to be at least 2 days apart from each other.

We note that so far the target has not shown signs of significant accretion-induced changes in the continuum compared to its quiescent state. Therefore, we expect that the continuum is similar to previous observations. However, our setup is robust against continuum changes up to a factor of 2-3.

Proposal 9448 - Targets - An accretion burst in a planetary mass objects: DDT observations of Cha1107-7626

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1) <i>Comments:</i> Category=Star Description=[Brown dwarfs, Exoplanets, Young stellar objects] Extended=NO	CHA1107-7626	RA: 11 07 7.6800 (166.7820000d) Dec: -76 26 32.60 (-76.44239d) Equinox: J2000	Proper Motion RA: -13.8 mas/yr Proper Motion Dec: -0.4 mas/yr Epoch of Position: 2000.0	

Proposal 9448 - Observation 1 - An accretion burst in a planetary mass objects: DDT observations of Cha1107-7626

Fri Aug 01 20:00:50 GMT 2025

Observation	Proposal 9448, Observation 1: NIRSPEC_epoch1 Diagnostic Status: Warning Observing Template: NIRSPEC Fixed Slit Spectroscopy											
	(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous			
	(1)	CHA1107-7626	RA: 11 07 7.6800 (166.7820000d) Dec: -76 26 32.60 (-76.44239d) Equinox: J2000			Proper Motion RA: -13.8 mas/yr Proper Motion Dec: -0.4 mas/yr Epoch of Position: 2000.0						
<i>Comments:</i> Category=Star Description=[Brown dwarfs, Exoplanets, Young stellar objects] Extended=NO												
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	SAME	WATA	SUB32	F140X	NRSRAPIDD6	3	1	1	0.26	258590	
Template	HFF Readout Mode				Slit			Subarray				
	false				S200A2			FULL				
Dithers	#	Primary Dither Positions						Sub-Pixel Pattern				
	1	3						NONE				
Spectral Elements	#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Ex #	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	PRISM/CLEAR	S200A2	NRSIRS2RAPID	5	2	1	NONE	3	6	525.2	258590
	2	G140H/F100LP	S200A2	NRSIRS2RAPID	20	2	2	NONE	3	6	1838.2	258590
	3	G235H/F170LP	S200A2	NRSIRS2RAPID	20	2	3	NONE	3	6	1838.2	258590

Proposal 9448 - Observation 1 - An accretion burst in a planetary mass objects: DDT observations of Cha1107-7626

Special Requirements

Before Date 01-SEP-2025:00:00:00
3 After 1 by 2.0 Days to <None specified>
Group Observations 1, 2, Non-interruptible

Proposal 9448 - Observation 3 - An accretion burst in a planetary mass objects: DDT observations of Cha1107-7626

Fri Aug 01 20:00:50 GMT 2025

Observation	Proposal 9448, Observation 3: NIRSPEC_epoch2 Diagnostic Status: Warning Observing Template: NIRSPEC Fixed Slit Spectroscopy											
	(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous			
	(1)	CHA1107-7626	RA: 11 07 7.6800 (166.7820000d) Dec: -76 26 32.60 (-76.44239d) Equinox: J2000			Proper Motion RA: -13.8 mas/yr Proper Motion Dec: -0.4 mas/yr Epoch of Position: 2000.0						
<i>Comments:</i> Category=Star Description=[Brown dwarfs, Exoplanets, Young stellar objects] Extended=NO												
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	SAME	WATA	SUB32	F140X	NRSRAPIDD6	3	1	1	0.26	258590	
Template	HFF Readout Mode				Slit			Subarray				
	false				S200A2			FULL				
Dithers	#	Primary Dither Positions					Sub-Pixel Pattern					
	1	3					NONE					
Spectral Elements	#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Ex #	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	PRISM/CLEAR	S200A2	NRSIRS2RAPID	5	2	1	NONE	3	6	525.2	258590
	2	G140H/F100LP	S200A2	NRSIRS2RAPID	20	2	2	NONE	3	6	1838.2	258590
	3	G235H/F170LP	S200A2	NRSIRS2RAPID	20	2	3	NONE	3	6	1838.2	258590

Proposal 9448 - Observation 3 - An accretion burst in a planetary mass objects: DDT observations of Cha1107-7626

Special Requirements

Before Date 01-SEP-2025:00:00:00

3 After 1 by 2.0 Days to <None specified>

4 After 3 by 2.0 Days to <None specified>

Proposal 9448 - Observation 4 - An accretion burst in a planetary mass objects: DDT observations of Cha1107-7626

Fri Aug 01 20:00:50 GMT 2025

Observation	Proposal 9448, Observation 4: NIRSPEC_epoch3 Diagnostic Status: Warning Observing Template: NIRSPEC Fixed Slit Spectroscopy											
	(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous			
	(1)	CHA1107-7626	RA: 11 07 7.6800 (166.7820000d) Dec: -76 26 32.60 (-76.44239d) Equinox: J2000			Proper Motion RA: -13.8 mas/yr Proper Motion Dec: -0.4 mas/yr Epoch of Position: 2000.0						
<i>Comments:</i> Category=Star Description=[Brown dwarfs, Exoplanets, Young stellar objects] Extended=NO												
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	SAME	WATA	SUB32	F140X	NRSRAPIDD6	3	1	1	0.26	258590	
Template	HFF Readout Mode				Slit			Subarray				
	false				S200A2			FULL				
Dithers	#	Primary Dither Positions					Sub-Pixel Pattern					
	1	3					NONE					
Spectral Elements	#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Ex #	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	PRISM/CLEAR	S200A2	NRSIRS2RAPID	5	2	1	NONE	3	6	525.2	258590
	2	G140H/F100LP	S200A2	NRSIRS2RAPID	20	2	2	NONE	3	6	1838.2	258590
	3	G235H/F170LP	S200A2	NRSIRS2RAPID	20	2	3	NONE	3	6	1838.2	258590

Proposal 9448 - Observation 4 - An accretion burst in a planetary mass objects: DDT observations of Cha1107-7626

Special Requirements

Before Date 01-SEP-2025:00:00:00

4 After 3 by 2.0 Days to <None specified>

Proposal 9448 - Observation 2 - An accretion burst in a planetary mass objects: DDT observations of Cha1107-7626

Fri Aug 01 20:00:50 GMT 2025

Observation	Proposal 9448, Observation 2: MIRI_epoch1 Diagnostic Status: Warning Observing Template: MIRI Low Resolution Spectroscopy									
Diagnostics	(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections			Miscellaneous			
	(1)	CHA1107-7626	RA: 11 07 7.6800 (166.7820000d) Dec: -76 26 32.60 (-76.44239d) Equinox: J2000	Proper Motion RA: -13.8 mas/yr Proper Motion Dec: -0.4 mas/yr Epoch of Position: 2000.0						
	Comments: Category=Star Description=[Brown dwarfs, Exoplanets, Young stellar objects] Extended=NO									
Acquisition	#	Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	SAME	F560W	FAST	10	1	1	27.75	258590	
Template	Subarray				Obtain Verification Image?					
	FULL				true					
Dithers	#	Dither Type	No. Spectral Steps	Spectral Step Offset	No. Spatial Steps	Spatial Step Offset				
	1	ALONG SLIT NOD								
Pointing Verification	#	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Integrations	PV Exposures/Dith	PV Total Dithers	PV Total Exposure Time	PV ETC Wkbk.Calc ID	Filter
	1	FASTR1	10	1	1	1	1	27.75		F560W

Proposal 9448 - Observation 2 - An accretion burst in a planetary mass objects: DDT observations of Cha1107-7626

Spectral Elements	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
	Special Requirements	1	FASTR1	80	8	16	1	2	3590.902
	Before Date 01-SEP-2025:00:00:00 Group Observations 1, 2, Non-interruptible								