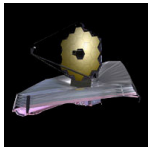

4539 - Spectroscopy of T8 WISE 2255-3118

Cycle: 3, Proposal Category: GTO

INVESTIGATORS

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	2	G395H and Prism	NIRSpec Fixed Slit Spectroscopy	(1) WISE-J225540.75-311842.0
	3	MIRI LRS	MIRI Low Resolution Spectroscopy	(1) WISE-J225540.75-311842.0

ABSTRACT

Young T dwarfs are excellent giant exoplanet analogs for studying the atmospheric properties of planetary-mass objects. We propose to observe T-dwarf WISE 2255-3118, which is likely a beta Pictoris moving group member with a very young age (~10MYr). By utilizing NIRSpec Prism and MIRI LRS spectroscopy, we will characterize the bolometric luminosity and constrain the atmospheric composition. The high-resolution G395H spectrum will provide a precise determination of the atmospheric abundances of CO,CH4, CO2 and H2O and hence the C/O ratio of the young T-dwarf atmosphere.

OBSERVING DESCRIPTION

Based on public HST image at epoch 2012,there is a background galaxy that is close to the target. The position angle is restricted to avoid the slit getting too close to the galaxy while doing 3-point-nod dithering along the NIRSpec slit.
SNR: Within the overall allocated time limit the NIRSpec Prism spectrum integration time was chosen to have at least SNR>5 at the deepest methane absorption at 3.4µm; the 395H spectrum to have SNR>100 at the 4-5µm for an isotopologue study of 13CO; and the MIRI LRS spectrum to have SNR>5 at around 12µm for bolometric luminosity measurement and constrain ammonia abundance from 10-12µm. The SNR for target acquisition is above 50 for both NIRSpec and MIRI.

6/25/24 revisions: As suggested by the STScI MIRI instrument reviewer we have added a TA verification image after the MIRI LRS observations. Apparently this will be used to get a better estimate of the slit loss corrections in later versions of the STScI MIRI LRS pipeline. We also slightly increased the number of groups per integration in the TA images. We are still within our 2.5 hour allocation time limit.

7/2/24. Slightly tweaked the RA proper motion of this fat-moving object based on recent astrometric measurments.

Proposal 4539 - Targets - Spectroscopy of T8 WISE 2255-3118

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WISE-J225540.75-311842.0	RA: 22 55 40.9282 (343.9205342d)	Proper Motion RA: 350.0 mas/yr	
		Dec: -31 18 43.50 (-31.31208d)	Proper Motion Dec: -162.1 mas/yr	
		Equinox: J2000	Parallax: 0.0707"	
			Epoch of Position: 2017.8151	

Comments: target coordinate is based on archived HST data idl229010_drz.fits (PID 15201) F127M
1.3" extended background galaxy seen at 22:55:40.8805; -31:18:43.002 at epoch 2012 F160W HST image.
Category=Star
Description=[Brown dwarfs]
Extended=NO

Observation

Proposal 4539, Observation 2: G395H and Prism Wed Jul 03 00:01:02 GMT 2024

Diagnostic Status: Warning

Observing Template: NIRSpec Fixed Slit Spectroscopy

Comments: include orientation range restriction to avoid potential contamination from background galaxy.

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)	WISE-J225540.75-311842.0	RA: 22 55 40.9282 (343.9205342d) Dec: -31 18 43.50 (-31.31208d) Equinox: J2000	Proper Motion RA: 350.0 mas/yr Proper Motion Dec: -162.1 mas/yr Parallax: 0.0707" Epoch of Position: 2017.8151	

Comments: target coordinate is based on archived HST data idl229010_drz.fits (PID 15201) F127M
1.3" extended background galaxy seen at 22:55:40.8805; -31:18:43.002 at epoch 2012 F160W HST image.
Category=Star
Description=[Brown dwarfs]
Extended=NO

Acquisition

#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	1 WISE-J225540.75-311842.0	WATA	SUB32	CLEAR	NRSRAPIDD6	3	1	1	0.26	157146.24

Template

Slit	Subarray
S200A1	FULL

Dithers

#	Primary Dither Positions	Sub-Pixel Pattern
1	3	NONE

Spectral Elements

#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395H/F290LP	S200A1	NRSIRS2RAPID	21	2	1	NONE	3	6	1925.733	157146.3
2	PRISM/CLEAR	S200A1	NRSIRS2RAPID	5	1	2	NONE	3	3	262.6	157146.4

Special Requirements	
	Aperture PA Range 0 to 106 Degrees (V3 221.15809631 to 327.15809631) Aperture PA Range 136 to 286 Degrees (V3 357.15809631 to 147.15809631) Aperture PA Range 316 to 359.99 Degrees (V3 177.15809631 to 221.14809631) Group Observations 2, 3, Non-interruptible

Observation

Proposal 4539, Observation 3: MIRI LRS Wed Jul 03 00:01:02 GMT 2024

Diagnostic Status: Warning

Observing Template: MIRI Low Resolution Spectroscopy

Diagnostics

(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)	WISE-J225540.75-311842.0	RA: 22 55 40.9282 (343.9205342d) Dec: -31 18 43.50 (-31.31208d) Equinox: J2000	Proper Motion RA: 350.0 mas/yr Proper Motion Dec: -162.1 mas/yr Parallax: 0.0707" Epoch of Position: 2017.8151	

Comments: target coordinate is based on archived HST data idl229010_drz.fits (PID 15201) F127M
1.3" extended background galaxy seen at 22:55:40.8805; -31:18:43.002 at epoch 2012 F160W HST image.
Category=Star
Description=[Brown dwarfs]
Extended=NO

Acquisition

#	Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	1 WISE-J225540.75-311842.0	F1000W	FAST	6	1	1	16.65	157146.23

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	6	1	1	1	1	16.65		F1000W

Spectral Elements

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	FASTR1	30	2	4	1	2	338.555	157146.6

Special Requirements

Aperture PA Range 0 to 106 Degrees (V3 355.24203 to 101.24203)
Aperture PA Range 136 to 286 Degrees (V3 131.24203 to 281.24203)
Aperture PA Range 316 to 359.99 Degrees (V3 311.24203 to 355.23203)

Group Observations 2, 3, Non-interruptible