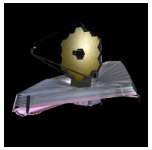

1644 - A cornerstone study of the jet/outflow connexion: the remarkable DG Tau B system

Cycle: 1, Proposal Category: GO

INVESTIGATORS

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	1	DGTau-Background	MIRI Medium Resolution Spectroscopy	(5) MIRIBACKGROUND
	2	DGTau-MIRI1	MIRI Medium Resolution Spectroscopy	(1) DG-TAU-B-MIRI1
	3	DGTau-MIRI2	MIRI Medium Resolution Spectroscopy	(2) DG-TAU-B-MIRI2
	5	DGTau-NIRSpec1	NIRSpec IFU Spectroscopy	(6) DG-TAU-B-NIRSPEC-1
	6	DGTau-NIRSpec2	NIRSpec IFU Spectroscopy	(7) DG-TAU-B-NIRSPEC-2
	4	DGTau-NIRCAM	NIRCam Imaging	(4) DG-TAU-B-NIRCAM

ABSTRACT

We propose a cornerstone study of the jet/outflow connexion with JWST in the remarkable DG tau B system. ALMA observations have revealed a narrow conical rotating CO outflow whose properties are challenging the traditional interpretation of these molecular outflows as swept up material. instead its properties appear compatible with a magnetic disk wind origin. These findings, if fully confirmed, have a crucial impact on proto-planetary disks. However, we are critically missing resolved spatial information on any warm wind component filling the gap between the hot (T=10^4 K) anf fast (V=100 km/s) jet and the cold (T=10 K) and slow (V=10 km/s) molecular outflow. We propose to map with MIRI-MRS, NIRspec-IFU & NIRCAM the inner 5" (=700 au) of the prototypical DG Tau B outflow in ro-vibrational and rotational H2, [Fe II], [S I] & [Ne II] emission lines. The proposed observations will establish for the first time a global view of the mass loss process in a young solar twin and discrimimate between the different models for the origin of outflowing CO cavities. These results will provide critical insights into the importance of mass loss and magnetic field in proto-planetary disk evolution

OBSERVING DESCRIPTION

We propose to map the inner 5" region of the DG Tau B jet/outflow with MIRI-MRS & NIRSpec-IFU in
the G140H and G235H grism. Two fields will be required with both NIRspec & MIRI.
We aim for line brightness sensitivity in the range: SNR=10 at the peak of the line and per spaxel for of brightness of 2e-15 erg/s/cm2/arcsec2 = 10-4 erg/s/cm2/sr.

Short exposures (ngroups=30) will be used with MIRI because of the strong central continuum source.
In each case, a four point dithering for extended source will be used.
A separated off field background exposure will be obtained for both MIRI and a leakcal exposure with NIRSpec-IFU.
We will complement these observations with narrow band imaging with NIRCAM in the F164N & F212N narrow band filters
to map the bright FeII 1.64 and H2 2.12 microns lines.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	DG-TAU-B-MIRI1	RA: 04 27 2.6046 (66.7608525d) Dec: +26 05 29.79 (26.09161d) Equinox: J2000		
Comments: *Category=Star* *Description=[Protostars]* *Extended=YES*				
(2)	DG-TAU-B-MIRI2	RA: 04 27 2.3688 (66.7598700d) Dec: +26 05 31.42 (26.09206d) Equinox: J2000		
Comments: *Category=Star* *Description=[Protostars]* *Extended=YES*				
(4)	DG-TAU-B-NIRCAM	RA: 04 27 2.4236 (66.7600983d) Dec: +26 05 31.16 (26.09199d) Equinox: J2000		
Comments: *Category=Star* *Description=[Protostars]* *Extended=YES*				
(5)	MIRIBACKGROUND	RA: 04 27 2.5730 (66.7607208d) Dec: +26 05 30.17 (26.09171d) Equinox: J2000		
Comments: *Category=Calibration* *Description=[Telescope/sky background]* *Extended=YES*				
(6)	DG-TAU-B-NIRSPEC-1	RA: 04 27 2.6067 (66.7608613d) Dec: +26 05 29.93 (26.09165d) Equinox: J2000		
Comments: *Category=Star* *Description=[Protostars]* *Extended=YES*				
(7)	DG-TAU-B-NIRSPEC-2	RA: 04 27 2.4223 (66.7600929d) Dec: +26 05 31.22 (26.09201d) Equinox: J2000		
Comments: *Category=Star* *Description=[Protostars]* *Extended=YES*				

Observation

Proposal 1644, Observation 1: DGTau-Background Tue Jan 31 00:02:01 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observation For: [DGTau-MIRI1 (Obs 2), DGTau-MIRI2 (Obs 3)]

Diagnostics

(DGTau-Background (Obs 1)) Warning (Form): Record ETC Wkbk.Calc ID used to verify target acquisition.

(DGTau-Background (Obs 1)) Warning (Form): The slew between the acquisition exposure and the farthest science exposure is 94.274 Arcsec (larger than the recommended limit of 65.000 Arcsec) and may result in reduced or no schedulability. See more information in the diagnostic browser.

(DGTau-Background (Obs 1)) Warning (Form): This acquisition uses a target that has been marked as "background" and may not be appropriate for target acquisition.

(Exposure) Warning (Form): Record ETC Wkbk.Calc ID used to verify target acquisition.

(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(5)	MIRIBACKGROUND	RA: 04 27 2.5730 (66.7607208d) Dec: +26 05 30.17 (26.09171d) Equinox: J2000		

Comments:
Category=Calibration
Description=[Telescope/sky background]
Extended=YES

Acquisition

#	Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	FND	FAST	4	1	1	11.1	

Template

Primary Channel	Simultaneous Imaging	Imager Subarray
ALL	YES	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	EXTENDED SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1		IMAGER	F1800W	FASTR1	9	25	1	None	1	25	690.985	
1	LONG(C)	MRSLONG		FASTR1	15	16	1	None	1	16	707.635	
1	LONG(C)	MRSSHORT		FASTR1	15	16	1	None	1	16	707.635	
2		IMAGER	F560W	FASTR1	9	25	1	None	1	25	690.985	
2	MEDIUM(B)	MRSLONG		FASTR1	15	16	1	None	1	16	707.635	
2	MEDIUM(B)	MRSSHORT		FASTR1	15	16	1	None	1	16	707.635	
3		IMAGER	F1280W	FASTR1	9	25	1	None	1	25	690.985	
3	SHORT(A)	MRSLONG		FASTR1	15	16	1	None	1	16	707.635	
3	SHORT(A)	MRSSHORT		FASTR1	15	16	1	None	1	16	707.635	

Special Requirements	
	Aperture PA Range 78.0 to 78.0 Degrees (V3 78.0 to 78.0) Offset -113.66 arcsec, -18.6 arcsec Sequence Observations 1, 2, 3, Non-interruptible

Observation

Proposal 1644, Observation 2: DGTau-MIRI1 Tue Jan 31 00:02:01 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[DGTau-Background (Obs 1)]

Diagnostics

(DGTau-MIRI1 (Obs 2)) Warning (Form): Imager Filter overlap.

(DGTau-MIRI1 (Obs 2)) Warning (Form): Imager Filter overlap.

(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)	DG-TAU-B-MIRI1	RA: 04 27 2.6046 (66.7608525d) Dec: +26 05 29.79 (26.09161d) Equinox: J2000		

Comments:
Category=Star
Description=[Protostars]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
FND	ALL	YES	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	EXTENDED SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1		IMAGER	F1800W	FASTR1	10	11	1	Dither 1	4	44	1332.019	
1	LONG(C)	MRSLONG		FASTR1	15	8	1	Dither 1	4	32	1409.72	
1	LONG(C)	MRSSHORT		FASTR1	15	8	1	Dither 1	4	32	1409.72	
2		IMAGER	F560W	FASTR1	10	11	1	Dither 1	4	44	1332.019	
2	MEDIUM(B)	MRSLONG		FASTR1	15	8	1	Dither 1	4	32	1409.72	
2	MEDIUM(B)	MRSSHORT		FASTR1	15	8	1	Dither 1	4	32	1409.72	
3		IMAGER	F1280W	FASTR1	10	11	1	Dither 1	4	44	1332.019	
3	SHORT(A)	MRSLONG		FASTR1	15	8	1	Dither 1	4	32	1409.72	
3	SHORT(A)	MRSSHORT		FASTR1	15	8	1	Dither 1	4	32	1409.72	

Special Requirements	
	Aperture PA Range 78.0 to 78.0 Degrees (V3 78.0 to 78.0) Sequence Observations 1, 2, 3, Non-interruptible

Observation

Proposal 1644, Observation 3: DGTau-MIRI2 Tue Jan 31 00:02:01 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[DGTau-Background (Obs 1)]

Diagnostics

(DGTau-MIRI2 (Obs 3)) Warning (Form): Imager Filter overlap.

(DGTau-MIRI2 (Obs 3)) Warning (Form): Imager Filter overlap.

(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	DG-TAU-B-MIRI2	RA: 04 27 2.3688 (66.7598700d) Dec: +26 05 31.42 (26.09206d) Equinox: J2000		

Comments:
Category=Star
Description=[Protostars]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
FND	ALL	YES	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	EXTENDED SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1		IMAGER	F1800W	FASTR1	10	11	1	Dither 1	4	44	1332.019	
1	LONG(C)	MRSLONG		FASTR1	15	8	1	Dither 1	4	32	1409.72	
1	LONG(C)	MRSSHORT		FASTR1	15	8	1	Dither 1	4	32	1409.72	
2		IMAGER	F560W	FASTR1	10	11	1	Dither 1	4	44	1332.019	
2	MEDIUM(B)	MRSLONG		FASTR1	15	8	1	Dither 1	4	32	1409.72	
2	MEDIUM(B)	MRSSHORT		FASTR1	15	8	1	Dither 1	4	32	1409.72	
3		IMAGER	F1280W	FASTR1	10	11	1	Dither 1	4	44	1332.019	
3	SHORT(A)	MRSLONG		FASTR1	15	8	1	Dither 1	4	32	1409.72	
3	SHORT(A)	MRSSHORT		FASTR1	15	8	1	Dither 1	4	32	1409.72	

Special Requirements	
	Aperture PA Range 78.0 to 78.0 Degrees (V3 78.0 to 78.0) Sequence Observations 1, 2, 3, Non-interruptible

Observation

Proposal 1644, Observation 5: DGTau-NIRSpec1

Tue Jan 31 00:02:01 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

(Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(6)	DG-TAU-B-NIRSPEC-1	RA: 04 27 2.6067 (66.7608613d) Dec: +26 05 29.93 (26.09165d) Equinox: J2000		

Comments:
Category=Star
Description=[Protostars]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	4-POINT-DITHER				

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G140H/F100LP	NRSIRS2RAPID	20	2	false	true	NONE	4	8	2450.934	
2	G140H/F100LP	NRSIRS2RAPID	20	1	true	false	NONE	1	1	306.367	
3	G235H/F170LP	NRSIRS2RAPID	20	1	false	true	NONE	4	4	1225.467	
4	G235H/F170LP	NRSIRS2RAPID	20	1	true	false	NONE	1	1	306.367	

Observation

Proposal 1644, Observation 6: DGTau-NIRSpec2

Tue Jan 31 00:02:01 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

(Visit 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(7)	DG-TAU-B-NIRSPEC-2	RA: 04 27 2.4223 (66.7600929d) Dec: +26 05 31.22 (26.09201d) Equinox: J2000		

Comments:
Category=Star
Description=[Protostars]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	4-POINT-DITHER				

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G140H/F100LP	NRSIRS2RAPID	20	2	false	true	NONE	4	8	2450.934	
2	G140H/F100LP	NRSIRS2RAPID	20	1	true	false	NONE	1	1	306.367	
3	G235H/F170LP	NRSIRS2RAPID	20	1	false	true	NONE	4	4	1225.467	
4	G235H/F170LP	NRSIRS2RAPID	20	1	true	false	NONE	1	1	306.367	

Observation

Proposal 1644, Observation 4: DGTau-NIRCAM Tue Jan 31 00:02:01 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(4)	DG-TAU-B-NIRCAM	RA: 04 27 2.4236 (66.7600983d) Dec: +26 05 31.16 (26.09199d) Equinox: J2000		

Comments:
Category=Star
Description=[Protostars]
Extended=YES

Template

Module	Subarray
B	SUB640

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRAMODULEBOX	4	SMALL-GRID-DITHER		2

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F164N+F150W2	F323N+F322W2	BRIGHT1	5	4	32	8	1340.124	
2	F212N	F405N+F444W	BRIGHT1	5	4	32	8	1340.124	