



Observing Application

Date : Jun, 28 2013
 Proposal ID : VLA/13A-535
 Legacy ID : AT439
 PI : John Tobin
 Type : Director's Discretionary
 Time - Exploratory Time
 Category : Star Formation
 Total Time : 1.75

Characterizing the Free-Free Emission from Two Multiple Class 0/I Protostars

Abstract:

We propose observations of two protostars in C-band in order to constrain their free-free flux densities and spectral slopes. These data will be used immediately in a nearly finished paper to yield better estimates of the dust mass around these protostars.

The centimeter-wave spectral energy distribution of young stellar objects typically has a component from thermal dust emission and free-free emission originating from the ionized jet or wind. At 7 mm, there is typically still a significant free-free emission component (~25%) and it is important to remove its contribution to the observed flux density in order to calculate accurate dust masses.

Decoupling the dust and free-free emission at 7 mm and ~1 cm require good knowledge of the free-free flux and its spectral index, these are best constrained from observations at 4 cm and 6 cm, where dust emission is negligible. Constraining the free-free emission from simultaneously fitting the thermal and free-free slopes is possible, but this is difficult due to imperfect beam matching from the millimeter to centimeter.

The free-free emission is generally unresolved, making spatial filtering a negligible concern.

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Related proposals:

VLA/12A-082, VLA/12B-211

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Single Pointing(s)

VLA Resources

Name	Conf.	Frontend & Backend	Setup
C-band	C	C Band 6 cm 4000-8000 MHz WIDAR OSRO, Full Polarization	Rest frequencies: 4500.0,7500.0 MHz Subband Bandwidth: 128.0 MHz No. of Channels: 64 Poln. products: 4.0 Channel Width: 2000.0 kHz Total Bandwidth: 2,048.00 MHz

Sources:

Name	Position		Velocity		Group
CB230	Coordinate System	Equatorial	Convention	Radio	protostars
	Equinox	J2000			
	Right Ascension	21:17:38.56	Ref. Frame	LSRK	
		00:00:00.0			
	Declination	+68:17:33.3	Velocity	2.7	
00:00:00.0					
Calibrator	No				
L1165	Coordinate System	Equatorial	Convention	Radio	protostars
	Equinox	J2000			
	Right Ascension	22:06:50.46	Ref. Frame	LSRK	
		00:00:00.0			
	Declination	+59:02:45.9	Velocity	-1.5	
00:00:00.0					
Calibrator	No				

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
CB230	1.00	1	0 day	18:00:00	01:00:00	15
L1165	0.75	1	0 day	19:00:00	02:00:00	15

Session Constraints:

Name	Constraints	Comments

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
CB230	CB230 L1165	C-band	1.0 hour	0.076 mJy/bm	
L1165	CB230 L1165	C-band	0.75 hour	0.098 mJy/bm	

Present for observation: no

Staff support: None

Plan of Dissertation: no