



Observing Application

Date : Aug, 13 2010
 Proposal ID : VLA/10B-239
 Legacy ID : AD634
 PI : Robert Dickman
 Type : Rapid Response -
 Exploratory Time
 Category : Galactic, Extragalactic
 Total Time : 2.0

The Nature of an Unusual AzTEC Source Toward the Lupus-I Molecular Cloud

Abstract:

We propose Exploratory EVLA ECSO observations at 6 cm of an unusual continuum source lying toward the Lupus molecular clouds that was recently detected with the AzTEC array camera on the ASTE telescope. The proposed observations will distinguish between two intriguing scenarios that are consistent with the available data: the source is either a very dense and cold protostellar condensation in a relatively low-extinction region of the Lupus-I molecular cloud, or it is a background, highly red shifted submillimeter galaxy of unprecedented luminosity. The most efficient use of EVLA time would be to use the array with an IF bandwidth of 2 GHz. If the object is a submillimeter galaxy, the observations should detect the synchrotron component of the parent galaxy and yield an estimate of its spectral index. Alternatively, if the object is a local pre-stellar condensation, detecting emission in the 4830 MHz formaldehyde lines, which will be placed within a high-resolution sub-band of the proposed observations, will confirm the presence of a high molecular hydrogen density ($>10^6 \text{ cm}^{-3}$) and will provide other clues to local conditions within the cloud.

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Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup
Resource 1	D	C Band 6 cm 4000-8000 MHz WIDAR ECSO	Comments: 2 GHz total bandwidth. One correlator sub-band will be centered on the 4830 formaldehyde lines at the VLSR of Lupus-I and configured for high spectral resolution (16 kHz per channel). If Core B is a local condensation in the Lupus-I cloud, the 6 cm H ₂ CO lines will be readily detectable in emission and will constrain the molecular hydrogen density and kinetic temperature of the source.

Sources:

Name	Position		Velocity		Group
Core B	Coordinate System	Equatorial	Convention	Radio	Group 1
	Equinox	J2000			
	Right Ascension	15:45:06.34 00:00:00.0	Ref. Frame	LSRK	
	Declination	-34:43:18 00:00:00	Velocity	0.00	

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
Session 1	2.00	1	1 day	15:15:00	16:15:00	0

Session Constraints:

Name	Constraints	Comments
Session 1		Time per session includes calibration time; 40 minutes on source assumed per session

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
Session 1	Core B	Resource 1	2.0 hour	0.005 mJy/bm	

Present for observation: yes

Staff support: None

Plan of Dissertation: no