



Observing Application

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 Proposal ID : VLA/12B-396
 Legacy ID : AM1214
 PI : Sui Ann Mao
 Type : Director's Discretionary
 Time - Exploratory Time
 Category : Normal Galaxies, Groups,
 and Clusters
 Total Time : 10.0

Probing the Magnetic Field in Local Starburst Galaxy M82 - A Pilot Study

Abstract:

We propose a search for Zeeman splitting of OH kilomasers in the central region of the starburst galaxy M82. Measurements of the in situ magnetic field in the dense phase of the ISM will allow us to test if minimum energy magnetic field holds in this local starburst. Moreover, an estimation of the magnetic field strength will constrain the velocity of the superwind in this galaxy. The geometry of the magnetic field near the nucleus of M82 can also be mapped out using the derived magnetic field direction from the splitting. Finally, these high spatial resolution Zeeman measurements can assist us in interpreting Zeeman effects of megamasers observed in ultra luminous infrared radio galaxies.

Authors:

Name	Institution	Email	Status
Sui Ann Mao	National Radio Astronomy Observatory	mao@astro.wisc.edu	
Timothy Robishaw	Institute of Astrophysics, National Research Council Canada	tim.robishaw@nrc-cnrc.gc.ca	

Principal Investigator: Sui Ann Mao
 Contact: Sui Ann Mao
 Telephone: 6176422420
 Email: mao@astro.wisc.edu

Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Spectroscopy, Polarimetry

VLA Resources

Name	Conf.	Frontend & Backend	Setup
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Name	Conf.	Frontend & Backend	Setup
OH_lines	A	L Band 20 cm 1000 - 2000 MHz WIDAR RSRO	Comments: We will use the following correlator setup for each OH main line/ satellite line: 1MHz bandwidth, full polarization, 512 channels. We may choose to have even higher spectral resolution. The remaining correlator resources will either be used to measure the continuum or to map the 21 cm line.

Testing Resource Images

Sources:

Name	Position		Velocity		Group
M82_target	Coordinate System	Equatorial	Convention	Optical	M82
	Equinox	J2000	Ref. Frame	Barycentric	
	Right Ascension	09:55:52.72 00:00:00.0	Redshift	0.000781	
	Declination	+69:40:45.7 00:00:00.0			

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
M_82_session1	3.00	2	0 day	02:00:00	18:00:00	0
M_82_session2	4.00	1	0 day	02:00:00	18:00:00	0

Session Constraints:

Name	Constraints	Comments

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
M_82_session1	M82_target	OH_lines	3.0 hour	1.6 mJy/bm	
M_82_session2	M82_target	OH_lines	4.0 hour	1.6 mJy/bm	

Present for observation: yes

Staff support: Friend

Plan of Dissertation: no