Observing Application

Date :	Jan, 11 2009
Proposal ID :	VLA/08C-246
Legacy ID :	AG815
PI :	Ciriaco Goddi
Type :	Rapid Response - Exploratory Time
Category :	Galactic
Total Time :	6.0

High-angular resolution Imaging of SiO maser isotopic emission in Orion Source I

Abstract:

In February 2008 (AG776), we used the VLA in B-configuration to observe five rotational transitions from three SiO isotopologues in Orion Source I at 7mm: 28SiO v=0,1,2 and 29SiO and 30SiO v=0 (J=1-0). For the first time, we mapped the 29SiO and 30SiO v=0 J=1-0 emission, established the maser nature of the emission, and confirmed association with Source I. In particular, the isotopic SiO maser emission has a compact distribution (radii<100 AU), globally similar to the 28SiO v=1,2 emission. However, owing to low angular (0.2") and spectral resolution (2.7 km/s), spectral blending significantly affected the analysis of relative positions of maser centroids. With 0.2" resolution, maser centroids appear to be distributed in two (blue- and red-shifted) arcs around source I. VLBA images show instead that SiO masers arise actually in an X-structure tracing a rotating biconical outflow. VLA A-configuration will be able to resolve the emission from different components of the X. We request 2x3 hours of observing time in the VLA A-configuration to map the v=0 emission of isotopologues 28SiO, 29SiO, and 30SiO.

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Related proposals:

AG776

Joint:

Not a Joint Proposal

Observing type(s):

Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup
Q-A-29	A	Q Band 0.7 cm 40000 - 50000 MHz VLA Correlator - Spectral Line	Rest frequencies: 42879.82,43122.03 MHz Bandwidth: 6.25 MHz Spectral resolution: 97.656 kHz IF Mode: 2 No. of Channels: 64
Q-A-28	A	Q Band 0.7 cm 40000 - 50000 MHz VLA Correlator - Spectral Line	Rest frequencies: 43423.76,43122.03 MHz Bandwidth: 6.25 MHz Spectral resolution: 97.656 kHz IF Mode: 2 No. of Channels: 64
Q-A-30	A	Q Band 0.7 cm 40000 - 50000 MHz VLA Correlator - Spectral Line	Rest frequencies: 42373.34,42820.48 MHz Bandwidth: 6.25 MHz Spectral resolution: 97.656 kHz IF Mode: 2 No. of Channels: 64

Sources:

Name	RA / RA Range	Dec / Dec Range	Epoch	Velocity / z	Group
SRCI	05:35:14.5 00:00:00.0	-5:22:30 00:00:00	J2000	Velocity : 5	srci

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
SRCI-obs	3.00	2	0 day	01:00:00	10:00:00	20

Session Constraints:

Name	Constraints	Comments

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
SRCI-obs	SRCI	Q-A-28	1.0 hour	6 mJy/bm	
SRCI-obs	SRCI	Q-A-30	1.0 hour	6 mJy/bm	
SRCI-obs	SRCI	Q-A-29	1.0 hour	6 mJy/bm	

Present for observation: no Staff support: None Plan of Dissertation: no