



Observing Application

Date : Nov, 05 2009
 Proposal ID : VLA/09C-191
 Legacy ID : AR712
 PI : Victor M. Rivilla
 Type : Rapid Response -
 Exploratory Time
 Category : Galactic
 Total Time : 2.0

A nascent HII region in Orion Hot Core?

Abstract:

In our previous observing run with the VLA (proposal number AJ356) we have detected a new radio continuum source at Q band toward the Orion star forming region. The new radio source suddenly appears in 10 days (between 2009 March 9 and 19) within the hot core associated with massive protostars. With the present data, the nature of the new radio source cannot be constrained. It is very likely that we are observing the first nascent HII region according to our ideas of the evolution from hot cores to evolved HII regions. However, another possibility is that it may be a variable synchrotron source, either associated with the cloud or a background extragalactic object.

We propose to establish the nature (synchrotron or free-free) of the newly detected source by measuring the spectral index of the continuum emission by re-observing it in the K, Ka and Q bands in D configuration. These observations will be part of Victor M. Rivilla's PhD thesis.

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Related proposals:

AJ356: Protoclusters: Main mechanism for the formation of massive stars in our Galaxy?

Joint:

Not a Joint Proposal

Observing type(s):

Continuum

VLA Resources

Name	Conf.	Frontend & Backend	Setup
22 GHz continuum	D	K Band 1.3 cm 18000 - 26500 MHz VLA Correlator - Single Channel Continuum	Rest frequencies: 22485.1,22435.1 MHz Bandwidth: 50 MHz
33 GHz continuum	D	Ka Band 0.9 cm 26500 - 40000 MHz VLA Correlator - Single Channel Continuum	Rest frequencies: 33535.1,33585.1 MHz Bandwidth: 50 MHz
43 GHz continuum	D	Q Band 0.7 cm 40000 - 50000 MHz VLA Correlator - Single Channel Continuum	Rest frequencies: 43314.9,43364.9 MHz Bandwidth: 50 MHz

Sources:

Name	RA / RA Range	Dec / Dec Range	Epoch	Velocity / z	Group
Orion A	05:35:14.5 00:00:00.0	-5:22:31 00:00:00	J2000	Velocity : 4.00	HC3N Galactic sources

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
Ka band	0.66	1	0 day	04:35:00	05:15:00	30
Q band	0.66	1	0 day	05:15:00	05:55:00	30
K band	0.66	1	0 day	05:55:00	06:35:00	30

Session Constraints:

Name	Constraints	Comments

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
Ka band	Orion A	33 GHz continuum	0.66 hour	0.2 mJy/bm	
Q band	Orion A	43 GHz continuum	0.66 hour	0.4 mJy/bm	
K band	Orion A	22 GHz continuum	0.66 hour	0.08 mJy/bm	

Present for observation: no

Staff support: None

Plan of Dissertation: no