



Observing Application

Date : Nov, 11 2010
 Proposal ID : VLA/10C-230
 Legacy ID : AM1078
 PI : Joseph McMullin
 Type : Rapid Response -
 Exploratory Time
 Category : Galactic
 Total Time : 6.5

Exploring the Physics and Chemistry of the Radio Jets in Serpens SMM1.

Abstract:

We propose to observe both the centimeter continuum emission and a set of molecular shock tracers from the radio lobes and central core in the low mass star forming region, Serpens SMM1. This exploratory project will measure the emission from C to Q band to:

- 1) determine the current emission strength of the radio lobes, 2) determine the spectral energy distribution of the emission from 4-30 GHz, and 3) compare the emission with historical observations to discern patterns in the variability of the lobes and 4) use tracers of shock activity to explore the chemistry of the lobes and their impact on the surrounding material. These observations establish a baseline for a program to explore the evolution of the jets, their underlying physics and chemistry and their impact on the larger molecular structure. C configuration provides an ideal initial resolution for the region while the WIDAR 2 GHz BW enables short but sensitive observations.

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Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup
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Name	Conf.	Frontend & Backend	Setup
C band	C	C Band 6 cm 4000-8000 MHz WIDAR RSRO	Comments: Setup 2x1 GHz basebands (avoiding known RFI for optimal bandwidth).
X band	C	X Band 3.6 cm 8080 - 8750 MHz WIDAR RSRO	Comments: Use as many wideband X band receivers as are available; signal to noise calculations are based on the narrow band Rxs.
K band	C	K Band 1.3 cm 18000 - 26500 MHz WIDAR RSRO	Comments: Use 2 GHz bandwidth
Ka band	C	Ka Band 0.9 cm 26500 - 40000 MHz WIDAR RSRO	Comments: Use 2 GHz bandwidth.
Q band spectral line	C	Q Band 0.7 cm 40000 - 50000 MHz WIDAR RSRO	Comments: We can get several molecular species within a single correlator configuration (CS J=1-0, CH ₃ OH 1(0,1)-0(0,1), H ₂ CO 1(0,1)-0(0,0), and SiO J=1-0 being the key tracers which can act as 'dyes' of different levels of energetic activity in the region).

Sources:

Name	Position		Velocity		Group
S68FIRS1	Coordinate System	Equatorial	Convention	Radio	Serpens
	Equinox	J2000			
	Right Ascension	18:29:49.75 00:00:00.0	Ref. Frame	LSRK	
	Declination	+01:15:20.71 00:00:00.0	Velocity	9.00	

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
C band	0.20	1	0 day	15:00:00	20:00:00	30
X band	0.70	1	0 day	15:00:00	20:00:00	30
K band	0.50	1	0 day	15:00:00	20:00:00	30
Ka band	0.60	1	0 day	15:00:00	20:00:00	30
Q band	4.50	1	0 day	15:00:00	20:00:00	30

Session Constraints:

Name	Constraints	Comments