Observing Application

Date :	Jun, 28 2010
Proposal ID :	VLA/10B-230
Legacy ID :	AS1059
PI :	Chelsea Sharon
Type :	Rapid Response - Exploratory Time
Category :	Extragalactic
Total Time :	9.0

Cold gas in a multi-component submm galaxy with varying excitation conditions

Abstract:

We propose to observe the CO (1-0) line in the highly obscured submillimeter galaxy (SMG) SMM J00266+1708 (J00266). Recent observations with the Zpectrometer and the Plateau de Bure Interferometer indicate that this SMG has multiple kinematic components with excitation conditions that violate the emerging picture of a common SMG CO (3-2)/CO (1-0) line ratio. With an anomalously low CO (3-2)/CO (1-0) line ratio and extremely high obscuration, J00266 is a very desirable target for probing the properties of a broader range of ISM conditions in SMGs. The proposed observation of the J=1-0 line, when used in conjunction with our other CO observations, will allow us to (a) derive more robust estimates of the gas excitation and physical conditions in both components, (b) further examine problems with using only mid-J transitions to determine the properties of gas in SMGs, and (c) probe whether different excitation CO lines even trace the same parent gas distribution. By understanding the anomalous properties of J00266 we will gain insight on the processes that regulate ISM physical conditions in SMGs and other dusty high-redshift systems.

Authors:

Name	Institution	Email	Status
Chelsea Sharon	Rutgers, The State University of New Jersey	csharon@physics.rutgers.edu	Graduating: 2012 Thesis: true
Andrew Baker	Rutgers, The State University of New Jersey	ajbaker@physics.rutgers.edu	
Andrew Harris	Maryland, University of	harris@astro.umd.edu	
Linda Tacconi	Max Planck Institute For Extraterrestrial Physics	linda@mpe.mpg.de	
Dieter Lutz	Max Planck Institute For Extraterrestrial Physics	lutz@mpe.mpg.de	

Principal Investigator: Chelsea Sharon
Contact: Chelsea Sharon
Telephone: +1-732-445-5500x5881
Email: csharon@physics.rutgers.edu

Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup
J00266-lowres	D	Ka Band 0.9 cm 26500 - 40000 MHz WIDAR OSRO2: 1 Subband/Dual polz	Rest frequencies: 30804.7 MHz Bandwidth: 128.0 MHz No. of Channels: 256 Poln. products: 2.0 Channel Width: 500.0 kHz
J00266-hires	C	Ka Band 0.9 cm 26500 - 40000 MHz WIDAR OSRO2: 1 Subband/Dual polz	Rest frequencies: 30804.7 MHz Bandwidth: 128.0 MHz No. of Channels: 256 Poln. products: 2.0 Channel Width: 500.0 kHz

Sources:

Name	Position		Velocity		Group
SMM J00266+1708	**Coordinate System**	Equatorial	**Convention**	Redshift	SMG
	Equinox	J2000			
	Right Ascension	00:26:34.1	**Ref. Frame**	LSRK	
		00:00:00.0			
	Declination	+17:08:33	**Redshift**	2.742	
		00:00:00			

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
Low-res	4.00	1	0 day	19:00:00	05:00:00	30
High-res	5.00	1	0 day	19:00:00	05:00:00	30

Session Constraints:

Name	Constraints	Comments
Low-res		Either D or DnC configurations are acceptable, though our priority is for the C configuration track. The RMS is for a 4 MHz channel in 7 hours (excludes overhead).
High-res		This C configuration track is our top priority. The RMS is for a 4 MHz channel for 7 hours (excludes overhead).

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
Low-res	SMM J00266+1708	J00266-lowres	4.0 hour	0.091 mJy/bm	
High-res	SMM J00266+1708	J00266-hires	5.0 hour	0.091 mJy/bm	

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