



Observing Application

Date : Mar, 23 2010
Proposal ID : VLA/10A-253
Legacy ID : A1143
PI : Rob Ivison
Type : Rapid Response -
Exploratory Time
Category : Extragalactic
Total Time : 3.0

Imaging CO(1-0) in a bright, lensed Herschel-selected galaxy at $z=3$

Abstract:

The first observations of the widest Herschel survey, H-ATLAS, with the help of rich multi-wavelength data, have identified 5 exceptionally bright sources, believed to be strongly-lensed high-redshift SMGs. For the brightest one, ID81, we have a high-J CO-line redshift ($z=3.0386$) from Zspec. Here, we propose to use EVLA's Ka receivers to image rest-frame CO J=1-0 emission in ID81. Because the CO and continuum emission are likely to be highly amplified, we require measurements in D or DnC configuration to determine total flux densities. Based on observations of the Cosmic Eyelash, which is similarly bright, we expect $\sim 4\text{mJy}$ in the CO line (which, because of its minimal excitation requirements, offers the least biased view of the mass/distribution of metal-enriched H₂). In the fullness of time, we will be able to determine the total H₂ gas mass and distribution using the transition most capable of tracing its bulk, thus exploring the true size and total dynamical mass of this system, its SFE per total gas mass, and the relative distributions and dynamics of cold versus warm/SF-related gas.

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Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup
ID81	D	Ka Band 0.9 cm 26500 - 40000 MHz WIDAR OSRO1: 2 Subbands/Full polz	Rest frequencies: 32500,28542.317 MHz Bandwidth: 128.0 MHz No. of Channels: 64 Poln. products: 4.0 Channel Width: 2000.0 kHz

Name	Conf.	Frontend & Backend	Setup
ID81cont	D	X Band 3.6 cm 8080 - 8750 MHz WIDAR OSRO1: 2 Subbands/Full polz	Rest frequencies: 8396.0, 8524.0 MHz Bandwidth: 128.0 MHz No. of Channels: 64 Poln. products: 4.0 Channel Width: 2000.0 kHz

Sources:

Name	Position		Velocity		Group
ID81	Coordinate System	Equatorial	Convention	Radio	GOODS-N
	Equinox	J2000			
	Right Ascension	09:03:11.65 00:00:00.0	Ref. Frame	LSRK	
	Declination	+00:39:05 00:00:00	Velocity	0.00	

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
ID81	2.00	1	0 day	07:00:00	11:00:00	30
ID81cont	1.00	1	0 day	08:00:00	10:00:00	30

Session Constraints:

Name	Constraints	Comments
ID81		With 20 antennas and 2x2-MHz channels, we should reach 165uJy/beam rms; with 15 antennas we should reach 220 uJy/beam rms
ID81cont		

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
ID81	ID81	ID81	2.0 hour	0.165 mJy/bm	
ID81cont	ID81	ID81cont	1.0 hour	0.025 mJy/bm	

Present for observation: no

Staff support: Consultation

Plan of Dissertation: yes