Observing Application

Date :	Apr, 07 2010
Proposal ID :	VLA/10A-258
Legacy ID :	AR723
PI :	Dominik Riechers
Type :	Rapid Response - Exploratory Time
Category :	Extragalactic
Total Time :	10.0

CO 2-1 in the Most Distant Submillimeter Galaxy and its Environment at z=5.298

Abstract:

We have made an exciting discovery: the bright submillimeter source AzTEC-3 is the by far highest redshift submillimeter galaxy (SMG) known. Six days ago, we were awarded IRAM/PdBI DDT, which enabled us to confirm the source's redshift to be an unprecedented z=5.298 through strong CO 5-4 and 6-5 detections. Moreover, this massive, gas-rich starburst galaxy is surrounded by a high overdensity of 'normal' star-forming galaxies, suggesting that we have discovered a massive protocluster only 1.1 Gyr after the Big Bang. This moderate request for EVLA exploratory time aims to detect the integrated emission from the low-J CO 2-1 line in the central SMG, as only possible in D array under winter/spring high frequency weather conditions (as available now and only again in 3 years). This will constrain the physical properties of this exceptional source, allowing us to determine the total molecular gas mass and gas excitation in the SMG. These observations will be vital to design a timely 0.2" (1.3 kpc) resolution CO follow-up campaign as only possible with the EVLA in B array this winter, mapping out the gas morphology, dynamics, and environment.

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Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup
CO2-1	D	Ka Band 0.9 cm 26500 - 40000 MHz WIDAR OSRO1: 2 Subbands/Full polz	Rest frequencies: 36604.9 MHz Bandwidth: 128.0 MHz No. of Channels: 64 Poln. products: 4.0 Channel Width: 2000.0 kHz

Sources:

Name	Position		Velocity		Group
AzTEC-3	**Coordinate System**	Equatorial	**Convention**	Redshift	Cluster
	Equinox	J2000			
	Right Ascension	10:00:20.7	**Ref. Frame**	LSRK	
		00:00:00.0			
	Declination	+02:35:20	**Redshift**	5.298	
		00:00:00			

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
CO2-1	5.00	2	0 day	00:00:00	24:00:00	30

Session Constraints:

Name	Constraints	Comments

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
CO2-1	AzTEC-3	CO2-1	5.0 hour	0.04 mJy/bm	

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