



Observing Application

Date : Dec, 26 2012
 Proposal ID : VLA/12B-408
 Legacy ID : AK813
 PI : Nissim Kanekar
 Type : Director's Discretionary
 Time - Exploratory Time
 Category : High Redshift and Source
 Surveys
 Total Time : 1.75

Confirming detections of molecular absorption in a blind GBT absorption survey

Abstract:

We propose to use the VLA Q-band receivers to confirm nine tentative ($> 4 \sigma$) detections of molecular absorption from our earlier blind GBT survey for CO 1-0 and HCO⁺ 1-0 absorption towards a radio-selected sample of 60 sources. This is the first unbiased survey for redshifted molecular absorption, and sensitive to molecular absorbers in the redshift range $0.85 < z < 2.4$. The proposed follow-up observations will allow, for the first time, an estimate of the probability of finding a molecular absorber per unit redshift interval as well as the cosmological mass density of molecular gas in the above redshift range. Confirmed absorbers will be followed up in HI 21cm and OH absorption, as well as other molecular lines, in order to study physical and chemical conditions in the absorber and to probe changes in the fundamental constants. We request a total of 1.75 hours of discretionary Q-band time for this project, which will allow us to detect each of the putative features at $\approx 10 \sigma$ significance.

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Related proposals:

AGBT07C-018

Joint:

Not a Joint Proposal

Observing type(s):

Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup
Q-band	Any	Q Band 0.7 cm 40000 - 50000 MHz WIDAR OSRO2: 1 Subband/Dual polz	Rest frequencies: 43000.0 MHz Subband Bandwidth: 128.0 MHz No. of Channels: 256 Poln. products: 2.0 Channel Width: 500.0 kHz Total Bandwidth: 128.00 MHz

Sources:

Name	Position		Velocity		Group
0102+480	Coordinate System	Equatorial	Convention	Redshift	Q1
	Equinox	J2000		Ref. Frame	
	Right Ascension	01:05:49.9	Redshift		
		00:00:00			
	Declination	+48:19:03.2			
Calibrator	No				
0202+319	Coordinate System	Equatorial	Convention	Redshift	Q1
	Equinox	J2000		Ref. Frame	
	Right Ascension	02:05:04.9	Redshift		
		00:00:00			
	Declination	+32:12:30.0			
Calibrator	No				
2126-158	Coordinate System	Equatorial	Convention	Redshift	Q1
	Equinox	J2000		Ref. Frame	
	Right Ascension	21:29:12.2	Redshift		
		00:00:00			
	Declination	-15:38:41.0			
Calibrator	No				
0332+078	Coordinate System	Equatorial	Convention	Redshift	Q2
	Equinox	J2000		Ref. Frame	
	Right Ascension	03:34:53.3	Redshift		
		00:00:00.0			
	Declination	+08:00:14.0			
Calibrator	No				
0414-189	Coordinate System	Equatorial	Convention	Redshift	Q2
	Equinox	J2000		Ref. Frame	
	Right Ascension	04:16:36.5	Redshift		
		00:00:00.0			
	Declination	-18:51:08.0			
Calibrator	No				