



# Observing Application

Date : Dec, 15 2011  
 Proposal ID : VLBA/11B-241  
 Legacy ID : BK174  
 PI : Nissim Kanekar  
 Type : Director's Discretionary  
 Time - Target of Opportunity  
 Category : High Redshift and Source Surveys  
 Total Time : 2.0

## The covering factor of a damped Lyman-alpha system at z=0.6039

### Abstract:

We propose to use the VLBA 1420 MHz receivers to measure the compact flux density of the quasar J1431+3952 towards which HI-21cm and damped Lyman-alpha absorption have been detected in an intervening absorber at z=0.6039. The observations will enable us to measure the covering factor of the absorber near the redshifted HI-21cm line frequency, and to thus determine its spin temperature. This is part of a large sample of HI-21cm absorbers that are being used to probe the evolution of physical conditions in normal galaxies at high redshifts. All data on the absorber (HI column densities from HST, HI-21cm spectra from GBT, and metallicities/abundances/images from Keck) will be in hand this month, and the VLBA observations for the covering factor will form the last piece of the puzzle in understanding the relation between the temperature distribution of neutral gas, metallicity and dust depletion in the system, to add it to our full sample. We request a total of 2 L-band hours for the observations, including all calibration.

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### Related proposals:

BK159, BK153, BK89, BK131,AGBT07B-008,AGBT03A-015,AGBT06B-042, AGB08A-076, AGB-09A025

### Joint:

Not a Joint Proposal

### Observing type(s):

Continuum, Spectroscopy

### VLBA Resources

Name	Details	Stations	Observing Parameters	Correlation Parameters

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DLA1420	<b>Wavelength:</b> 21 cm <b>Processor:</b> Socorro-DiFX <b>Observing</b> Standard	VLBA <input checked="" type="checkbox"/> Br <input checked="" type="checkbox"/> Fd <input checked="" type="checkbox"/> Hn <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/> La <input checked="" type="checkbox"/> Mk <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/> Ov <input checked="" type="checkbox"/> Pt <input checked="" type="checkbox"/> Sc <input checked="" type="checkbox"/> HSA Ar Ef GBT VLA-Y27 VLA-Y1 Geodetic	Bandwidth: 16 MHz Baseband 16 Channels Sample Rate 32 (Msample/s) Bits/Sample 2 Polarization Dual Agg. Bit Rate (Mbits/sec)	Full Polarization Pulsar Gate Correlator Passes 1 Integration Period (sec) 4.0 Spectral Points /BBC 64 No of Fields 0

### Sources:

Name	Position		Velocity		Group
J1431+3952	<b>Coordinate System</b>	Equatorial	<b>Convention</b>	Redshift	J1431
	<b>Equinox</b>	J2000			
	<b>Right Ascension</b>	14:31:20.53	<b>Ref. Frame</b>	Barycentric	
		00:00:00.0			
<b>Declination</b>	+39:52:41.2	<b>Redshift</b>	0.6039		
	00:00:00.0				

### Sessions:

Name	Session Time (hours)	Repeat	Separation	GST minimum	GST maximum	Elevation Minimum
L1	2.00	1	0 day	10:30:00	18:30:00	0

### Session Constraints:

Name	Constraints	Comments

### Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit
L1	J1431+3952	DLA1420	2.0 hour	1 mJy/bm

Staff support: None

Plan of Dissertation: no