



# Observing Application

Date : May, 29 2012  
 Proposal ID : VLBA/12A-481  
 Legacy ID : BK175  
 PI : Nissim Kanekar  
 Type : Director's Discretionary  
 Time - Target of Opportunity  
 Category : High Redshift and Source Surveys  
 Total Time : 4.0

## The covering factor of two high-redshift damped Lyman-alpha systems

### Abstract:

We propose to use the VLBA 327 and 1420 MHz receivers to measure the compact flux density of 2 quasars that are occulted by foreground damped Lyman-alpha absorbers (DLAs). These are part of a sample of 42 DLAs with estimates of the gas spin temperature from GMRT and GBT HI-21cm absorption studies. Our two targets are the only systems of the sample without estimates of the absorber covering factor from VLBI studies. The VLBA observations will enable us to measure the absorber covering factors and thus, to accurately estimate their spin temperatures. This will allow us to probe the redshift evolution of the fraction of cold HI in normal galaxies. All data on the two absorbers (HI column densities, HI-21cm spectra from GBT, and metallicities/abundances from Keck and the VLT) are already in hand 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 two systems, to add them to our full sample. We request a total of 2 L-band and 2 P-band hours for the observations, including all calibration.

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### Related proposals:

BK159, BK153, BK89, BK131, BK174, 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

Name	Details	Stations	Observing Parameters	Correlation Parameters
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"/> NI <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: 8 MHz Baseband 16 Channels Sample Rate 16 (Msample/s) Bits/Sample 2 Polarization Dual Agg. Bit Rate 512 (Mbits/sec)	Full Polarization Pulsar Gate Correlator Passes 1 Integration Period (sec) 4.0 Spectral Points /BBC 64 No of Fields 0
327	<b>Wavelength:</b> 90 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"/> NI <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: 4 MHz Baseband 8 Channels Sample Rate 8 (Msample/s) Bits/Sample 2 Polarization Dual Agg. Bit Rate 128 (Mbits/sec)	Full Polarization Pulsar Gate Correlator Passes 1 Integration Period (sec) 4.0 Spectral Points /BBC 64 No of Fields 1

### Sources:

Name	Position		Velocity		Group	
PKSB1122-168	<b>Coordinate System</b>	Equatorial	<b>Convention</b>	Redshift	L-band	
	<b>Equinox</b>	J2000		<b>Ref. Frame</b>		Barycentric
	<b>Right Ascension</b>	11:24:42.79 00:00:00.0	<b>Redshift</b>			0.6819
	<b>Declination</b>	-17:05:17.0 00:00:00.0				
PKS1354-174	<b>Coordinate System</b>	Equatorial	<b>Convention</b>	Redshift	P-band	
	<b>Equinox</b>	J2000		<b>Ref. Frame</b>		Barycentric
	<b>Right Ascension</b>	13:57:06.06 00:00:00.0	<b>Redshift</b>			2.7799
	<b>Declination</b>	-17:44:01.6 00:00:00.0				

### Sessions:

Name	Session Time (hours)	Repeat	Separation	GST minimum	GST maximum	Elevation Minimum
L-band	2.00	1	0 day	08:30:00	14:30:00	0
P-band	2.00	1	0 day	11:00:00	17:00:00	0

### Session Constraints:

Name	Constraints	Comments

### Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit
L-band	PKSB1122-168	DLA1420	2.0 hour	1 mJy/bm
P-band	PKS1354-174	327	2.0 hour	2 mJy/bm