Observing Application

Date :	Jul, 07 2011
Proposal ID :	VLA/11A-283
Legacy ID :	AM1110
PI :	John McKean
Type :	Director's Discretionary Time - Exploratory Time
Category :	High Redshift and Source Surveys
Total Time :	5.0

Extended molecular gas in radio-loud AGN?

Abstract:

We request DDT exploratory time to carry out spectral line imaging of the CO (1-0) transition from the type-2 gravitationally lensed quasar B1938+666 at redshift 2.059. These observations will be used to carry out the first study of the highly (<100 parsec) resolved structure of the molecular gas in a radio-loud AGN at high redshift. We will establish whether the gas is distributed around the central engine, or whether it is associated with jet-induced star formation at the location of the prominent jet and hot-spots of the AGN. For this, we require high resolution spectral line imaging of the system with the EVLA in A-configuration. Our study will also determine the true magnification of the molecular gas, which is needed to calculate the actual unlensed properties (line luminosities, gas mass, angular extents). We believe that previous studies of the molecular gas from this system have been biased by very high magnifications from simple, decade old lens models. Our results could have important implications for the interpretation of spectral line studies of lensed star-forming galaxies and quasars with the EVLA and ALMA in the future.

Authors:

Name	Institution	Email	Status
John McKean	Netherlands Foundation for Research in Astronomy	mckean@astron.nl	
Simona Vegetti	Kapteyn Astronomical Institute	vegetti@astro.rug.nl	
Christopher Fassnacht	California at Davis, University of	fassnacht@physics.ucdavis.edu	
Matthew Auger	California at Davis, University of	mauger@physics.ucdavis.edu	Graduating: 2008 Thesis: false
David Lagattuta	California at Davis, University of	lagattuta@physics.ucdavis.edu	Graduating: 2011 Thesis: false
Leon Koopmans	Kapteyn Astronomical Institute	koopmans@astro.rug.nl	

Principal Investigator: John McKean
Contact: John McKean
Telephone: +31521595780
Email: mckean@astron.nl

Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup
B1938+666	A	Ka Band 0.9 cm 26500 - 40000 MHz WIDAR OSRO1: 2 Subbands/Full polz	Rest frequencies: 37683.0,37811.0 MHz Subband Bandwidth: 128.0 MHz No. of Channels: 64 Poln. products: 4.0 Channel Width: 2000.0 kHz

Sources:

Name	Position		Velocity		Group
B1938+666	**Coordinate System**	Equatorial	**Convention**	Redshift	CLASS lenses
	Equinox	J2000			
	Right Ascension	19:38:25.29	**Ref. Frame**	LSRK	
		00:00:00.0			
	Declination	+66:48:52.96	**Redshift**	2.059	
		00:00:00.0			

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
B1938+666	5.00	1	0 day	00:00:00	24:00:00	12

Session Constraints:

Name	Constraints	Comments

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
B1938+666	B1938+666	B1938+666	5.0 hour	0.282 mJy/bm	

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