



Observing Application

Date : Mar, 30 2010
 Proposal ID : VLA/10A-254
 Legacy ID : AK744
 PI : Nissim Kanekar
 Type : Rapid Response -
 Exploratory Time
 Category : Extragalactic
 Total Time : 4.0

Confirming a tentative detection of CH megamaser emission at $z=0.886$

Abstract:

I propose to use the EVLA L-band receivers to confirm the detection of CH F=0-1 megamaser emission at $z=0.88582$ towards B1830-210 (from proposal AK723), and to also search for the F=1-0 line at this redshift. This would be the first detection of CH at cosmological distances. Further, if the CH F=0-1 line is real, the F=1-0 line is likely to also be detectable from the $z=0.88582$ galaxy. This is because the pumping mechanism that causes the F=0-1 line to be inverted typically also results in the inversion of the F=1-0 line (due to symmetries in the CH ground state). The F=0-1 and F=1-0 lines have different dependences on the fine structure constant and the proton-electron mass ratio, implying that a comparison between the line redshifts is sensitive to changes in these constants over cosmological time. The detection of both CH lines at $z=0.88582$ would allow an independent, high-sensitivity probe of changes in these constants. The total Rapid Response Science time request is 4 L-band hours, including all calibration.

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Related proposals:

AK723

Joint:

Not a Joint Proposal

Observing type(s):

Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup
CH-1830	D	L Band 20 cm 1000 - 2000 MHz WIDAR OSRO1: 2 Subbands/Full polz	Rest frequencies: 1730.703,1775.988 MHz Bandwidth: 128.0 MHz No. of Channels: 64 Poln. products: 4.0 Channel Width: 2000.0 kHz

Sources:

Name	Position		Velocity		Group
PKS 1830-210	Coordinate System	Equatorial	Convention	Redshift	O2-1830
	Equinox	J2000			
	Right Ascension	18:33:39.9	Ref. Frame	LSRK	
		00:00:00.0			
Declination	-21:03:39	Redshift	0.88582		
	00:00:00				

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
CH	4.00	1	0 day	15:30:00	21:00:00	10

Session Constraints:

Name	Constraints	Comments

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
CH	PKS 1830-210	CH-1830	4.0 hour	1.0 mJy/bm	

Present for observation: no

Staff support: Consultation

Plan of Dissertation: no