Observing Application

Date :	Aug, 26 2009
Proposal ID :	VLA/09B-210
Legacy ID :	AH1003
PI :	Carl Heiles
Type :	Rapid Response - Exploratory Time
Category :	Galactic
Total Time :	8.0

Confirming NVSS/GALFA-HI Absorption Spectra: Extremely Cold HI in the ISM

Abstract:

How cold can cold neutral medium (CNM) clouds be in the diffuse interstellar medium (ISM)? The astrophysics of heating/cooling suggests temperatures as low as 16 K in the absence of PAHs. Using the GALFA-HI data in the direction of NVSS sources we have recently found many directions with HI absorption lines suggestive of CNM temperatures as low as 10 K. To investigate these extremely cold CNM clouds, we propose an exploratory project to obtain sensitive HI absorption measurements against four continuum sources in the direction of intriguingly cold CNM clouds. These observations will allow us to: (i) establish the reliability of extremely cold clouds (detected from the GALFA-HI data set in the direction of NVSS sources); (ii) properly measure their spin temperature; and (iii) commence a study of physical processes responsible for the formation of unusually cold clouds in the ISM.

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Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup

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setup1	C	L Band 20 cm 1000 - 2000 MHz VLA Correlator - Spectral Line	Rest frequencies: 1420.406 MHz Bandwidth: 1.5625 MHz Spectral resolution: 6.104 kHz IF Mode: 1 No. of Channels: 256

Sources:

Name	RA / RA Range	Dec / Dec Range	Epoch	Velocity / z	Group
TXS 0726+077A	07:28:57.0 00:00:00.0	+07:38:26 00:00:00	J2000	Velocity : 0.00	Group0
J085845+1558	08:58:45.0 00:00:00.0	+15:58:55 00:00:00	J2000	Velocity : 0.00	Group1
J1134+0500	11:34:30.0 00:00:00.0	+05:00:06 00:00:00	J2000	Velocity : 0.00	Group2
J122058.1+301121	12:20:58.0 00:00:00.0	+30:11:09 00:00:00	J2000	Velocity : 0.00	Group3

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
session0	2.00	1	0 day	00:00:00	24:00:00	0
session1	2.00	1	0 day	00:00:00	24:00:00	0
session2	2.00	1	0 day	00:00:00	24:00:00	0
session3	2.00	1	0 day	00:00:00	24:00:00	0

Session Constraints:

Name	Constraints	Comments
session0		We can also use the first day or two of the move to DnC array for our observations
session1		We can also use the first day or two of the move to DnC array for our observations
session2		We can also use the first day or two of the move to DnC array for our observations
session3		We can also use the first day or two of the move to DnC array for our observations

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
session0	TXS 0726+077A	setup1	2.0 hour	7.0 mJy/bm	
session1	J085845+1558	setup1	2.0 hour	7.0 mJy/bm	
session2	J1134+0500	setup1	2.0 hour	7.0 mJy/bm	
session3	J122058.1+301121	setup1	2.0 hour	7.0 mJy/bm	

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