Proposal Identification No.: A2644 Date Received: 2011-Jun-03_17:31:32

Technical Page

Proposal Type:	Regular
General Category:	Astronomy
Sub-Category:	Spectroscopy
Observation Category:	Galactic
Total Time Requested:	24 Hours
Minimum Useful Time:	1.5 hours

Proposal Title: HI Absorption Line Study Toward The Perseus Molecular Cloud

ABSTRACT:

Recent analytical model for H2 formation in giant molecular clouds by Krumholz et al. (2009; KMT09) predicts that the minimum HI surface density = 6–10 solar mass/pc2 (at solar metallicity) is required for shielding H2 against photodissociation. We propose HI absorption measurements toward 19 radio continuum sources behind the Perseus molecular cloud to test KMT09's prediction. Our preliminary estimate of the HI surface density using the GALFA–HI emission data and under the assumption of optically thin HI gas shows that HI surface density is almost constant across Perseus with a value of 6–8 solar mass/pc2. However, the HI surface density may be underestimated due to the existence of high optical depth gas. With the proposed HI absorption and GALFA–HI emission spectra we will derive the optical depth correction for the GALFA–HI data for Perseus to test the KMT09's prediction.

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Remote Observing Request

- [ ] Observer will travel to AO
- [X] Remote Observing
- [ ] In Absentia (instructions to operator)

Instrument Setup

L-wide

Atmospheric Observation Instruments:

Special Equipment or setup: none

RFI Considerations

Frequency Ranges Planned

1420 - 1470 (for HI line)
1612 - 1720 (for OH lines)

This proposal requires Iridium RFI protection at 1612 MHz between 10pm and 6am EST.