

## Technical Page

Proposal Type:           Regular  
 General Category:       Astronomy  
 Sub-Category:           Spectroscopy  
   Observation Category: Galactic  
 Total Time Requested:  80 Hours  
 Minimum Useful Time:  1 hour

**Proposal Title:** True HI column density of five major giant molecular clouds

*ABSTRACT:*

We showed in Lee et al. that the HI surface density of the atomic envelope associated with the Perseus molecular cloud is relatively constant. This could be explained with the equilibrium model for H<sub>2</sub> formation whereby the observed HI saturation represents the shielding column necessary for the transition from atomic to molecular medium. However, an alternative explanation is the existence of high optical depth HI. While we have shown that this explanation does not hold in the case of Perseus, it is essential to investigate other Giant Molecular Clouds (GMCs) at different stages of chemical evolution. We are now investigating five GMCs covered by the GALFA-HI survey. To estimate the importance of the high optical depth HI we propose HI absorption observations in the direction of 80 radio continuum sources located behind these GMCs. We will derive the correction needed for the high HI column density and compare our findings with predictions from equilibrium and turbulent models.

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### Remote Observing Request

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

### Instrument Setup

L-wide

### Atmospheric Observation Instruments:

**Special Equipment or setup:** none

### RFI Considerations

## **Frequency Ranges Planned**

1420-1720

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