

Technical Page

Proposal Type: Regular
 General Category: Astronomy
 Sub-Category: Spectroscopy
 Observation Category: Galactic
 Total Time Requested: 90 Hours
 Minimum Useful Time: 1 hour

Proposal Title: Detailed Investigations of Anomalous Compact Clouds: Magnetic Fields and Molecules

ABSTRACT:

We have detected many very cold, marginally resolved clouds with the GALFA-HI survey. We have followed these up with both the VLA and the Arecibo 305m. We find them to be very compact, with cold cores at about $T = 20\text{K}$, and core sizes $< 30''$. Perhaps more impressively, the short pilot project using Arecibo turned up an extremely strong magnetic field of about 14 microGauss via Zeeman splitting in one cloud. This implies very strong magnetic pressures of near $180,000 / \text{cm}^3 \text{ K}$, dwarfing the standard thermal, turbulent, cosmic ray and magnetic pressures of the ISM combined. This result flies in the face of the standard picture of the cold neutral medium, which states that most of the gas is in pressure equilibrium near $3500 / \text{cm}^3 \text{ K}$. We wish to both confirm this result at a higher signal-to-noise as well as attempt to detect magnetic fields and molecules (OH) in small group of similar clouds.

Name	Institution	E-mail	Phone	Student
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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

1420-1421

1665-1666

1667-1668

1612-1613

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