Short talk

HINSA AS A TOOL FOR STUDYING DARK
CLOUDS AND STAR FORMATION

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Traditionally it has been difficult to obtain estimates of the HI content of molecular clouds due to the sheer complexity of the galactic background HI line. However, with the use of the recently discovered HINSA (HI Narrow Self-Absorption) features we are for the first time able to make direct measurements of the HI column density in cold molecular clouds with high extinction. This allows us to study a variety of properties in these clouds including the molecular to atomic hydrogen ratio. Measurements and understanding of this ratio can give us estimates of the chemical ages of these clouds, in turn providing us with constraints on star formation. More specifically we are able to place some constraints on the timescale over which a molecular cloud collapses from a diffuse ($A_v < 1$) to a compact star- forming state. Such constraints would have considerable impact on several disputed areas of star formation theory including the role of magnetic fields and ambipolar diffusion.

With new observations at the Green Bank Telescope we have greatly increased the amount of available HINSA data previously obtained using the Arecibo telescope, and though our analysis is still very much preliminary, we are beginning to see that HINSA and its correlations with molecular, IR, and optical data may prove to be a more useful tool in studying dark molecular clouds and other objects than previously anticipated.