

Talk at Splinter Meeting

Splinter B

BASIC PROPERTIES OF DIFFUSE NEUTRAL CLOUDS IN THE MILKY
WAY: HIGH-RESOLUTION STUDY

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A set of diffuse interstellar clouds in the inner Galaxy has been observed at an angular resolution of ≈ 1 arcmin combining data from the NRAO Very Large Array and the Green Bank Telescope. These are the first images of the diffuse neutral HI clouds that may constitute a considerable fraction of the interstellar medium (ISM). At the estimated distance of the clouds, the linear resolution ranges from ~ 1.9 to ~ 2.8 pc. These clouds have been chosen to be outside of the Galactic plane in order not to be confused with unrelated emission, and to lie near the tangent points in the inner Galaxy so that their distances can be quantified. But in general they belong to a widespread and ubiquitous Galactic population. Their locations are at $2.3 \leq R \leq 6.0$ kpc from the Galactic Center and $-1000 \leq z \leq +610$ pc from the Galactic plane. Peak HI column densities lie in the range $N_{\text{HI}} = 0.8\text{--}2.9 \times 10^{20} \text{ cm}^{-2}$. Cloud diameters vary between about 10 and 100 pc, and their HI mass spans the range from less than a hundred to a few thousands M_{\odot} . The clouds hardly show any morphological consistency, except that their shapes are highly irregular. One cloud may lie within the hot wind bubble around the nucleus of the Galaxy, and some clouds show evidence of two distinct thermal phases as would be expected from equilibrium models of the ISM.