

CARMA Mapping of CN, C¹⁸O, N₂H⁺, HCN, & HCO⁺ Toward W3OH

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We present an extensive multi-species study performed with CARMA of the region around W3(OH), a source which has previously had a CN Zeeman detection. By comparing maps in CN, C¹⁸O, N₂H⁺, HCN, and HCO⁺, we effectively probe a large range of densities in order to describe the physical conditions that CN traces. In addition, we quantify and explore the causes of differences between spectra derived from our high-resolution interferometric maps and a lower resolution single-dish study and estimate that CARMA is detecting ~65% of the CN emission in the 1 square arc minute region around W3(OH), a factor of 3 improvement over previous studies. From this, we determine that it is feasible to perform future interferometric CN Zeeman measurements in order to map the structure of the magnetic field in this region. These future observations may be able to directly probe the properties of star forming regions and can serve as an important observational test of current star formation theory.