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ABSTRACT ONLY

MOLECULAR CLOUDS IN LOW METALLICITY DWARF GALAXIES.

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In the standard paradigm stars form out of molecular clouds. These clouds are dense concentrations of H_2 that are traditionally traced in external galaxies using transitions of CO or other, more complex,molecules. But dwarf irregular (dIm) galaxies seemingly contradict this fundamental picture. Tracers of recent star formation, such as Halfa or far-ultraviolet (FUV) emission, show that most dwarfs contain young stars and star clusters, but CO observations often yield only upper limits. The supposition is that H2 is actually present in star-forming regions in dIm galaxies even when CO is undetected. The structure of star-forming clouds at low metallicity is predicted to be different from that at high metallicity. As the metallicity drops, the cold and dense, CO-emitting part of a cloud where stars form shrinks relative to the warm photo-dissociation region (PDR) around it. The molecular hydrogen part can become much more extensive than the CO, and the atomic hydrogen layer around all of this can be more extensive still. I will present the results of the properties of the molecular clouds in low metallicity galaxies along the sequence of decreasing metallicity from the LMC (50% solar), the SMC (20% solar), and WLM (13% solar). CO observations with ALMA of star-forming regions at the lowest metallicities of these dwarfs, shows, in the case of the WLM galaxy, tiny CO clouds inside much larger molecular and atomic hydrogen envelopes.

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