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**\pardProperties of Diffuse gas to Prestellar Cores\pard**
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$-abstract-$\pardWhile star structure and star evolution are generally agreed theories, star formation is one of the least understood processes in cosmic evolution. That is because the formation of stars is a complex process combining turbulence, magnetic fields, and gravity. Turbulence is a chaotic process and adds kinetic energy; magnetic fields act like rubber bands, and are difficult to observe; and when the mass of a gas achieves Jeans mass, it can potentially collapse under the force of gravity. These are three physical processes and each may play a dominant role in molecular cloud collapse and hence star formation. As a consequence, the following question arises: how much of which drives the collapse of molecular clouds? In this study we ran a simulation of a supersonic turbulent molecular cloud with magnetic fields and self gravity to follow the properties of the gas from its diffuse state to high density prestellar cores. By using Lagrangian tracer particles that follow the history of the gas which composes the cores, we can study how the density, magnetic energy, and kinetic energy evolve. The simulation of the molecular cloud is performed using an adaptive mesh refinement (AMR) magnetohydrodynamic (MHD) code Enzo, and we use the yt software to analyze its data.\pard-/abstract-\pard

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