

P142a Giant Molecular Cloud Collisions as Triggers of Star Cluster Formation

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We study giant molecular cloud (GMC) collisions and their ability to trigger massive star cluster formation. Star formation sub-grid models are added to our three dimensional magnetized, turbulent, colliding GMC simulations. Two primary models, with variation of parameters, are explored: (1) “Density- Regulated,” i.e., fixed efficiency per free-fall time above a set density threshold; (2) “Magnetically-Regulated,” i.e., fixed efficiency per free-fall time in regions that are magnetically supercritical. Contrasting colliding and non-colliding scenarios, we compare the star formation rate over time, the spatial clustering of the stars via a minimum spanning tree (MST) method, and the resulting kinematics of the star particles in comparison to the natal gas. Key properties of the star-forming gas, such as filament vs. magnetic field orientations, mass-to-flux ratio, density, and temperature, are analyzed and compared with observations of young cluster-forming regions in the Galaxy.