

# Star Formation and Fragmentation in Dense Cores in Orion A

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When dense cores in molecule clouds collapse and form protostars, they may fragment into some smaller structures and develop multiple systems. However, the key mechanisms that control fragmentation remain unclear observationally. In this project, we try to answer this question by analyzing the physical conditions(i.e.: density, turbulence, magnetic field, Jeans instability) of dense cores in Orion A and comparing the environment of single systems and binary/multiple systems.

By comparing the dense cores that form single protostar and dense cores that form binary/multiple system, we found that the dense cores with a greater core size-to-jeans length ratio or greater core mass-to-jeans mass tend to be more unstable and were prone to fragment into binary/multiple system. Additionally, the cores with single protostars tend to have larger ratio of  $P_B/u_G$  (magnetic pressure/gravitational energy density), which implies that magnetic field may suppress the fragmentation of dense cores.

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