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(G*) (POS-76) Same Data, New Insights: Virial Analysis of Ammonia-Identified Clumps in Giant Molecular Clouds

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The KEYSTONE (KFPA Examinations of Young STellar Object Natal Environments) Survey observed ammonia gas toward 11 high-mass star-forming regions at distances of 0.7-2.7 kpc. Previous analysis of these data (Keown+, 2019) utilized a single line-of-sight velocity component in fitting the ammonia gas. Here we present results of a multiple-component fit to the same clouds over the NH₃ (1,1) inversion transition. We find that at least two components justifiably improve the fit in an average of 20% of fitted pixels, with ~4% necessitating a third component. From this multi-component fitting, we produce a catalogue of dense cores and their associated virial parameters. We examine the dynamical state of these cores, to study the effect of external pressure on boundedness, how well these high-mass star-forming cores are contained under self-gravity. We highlight connections between the properties of these compact sources and those of the broader clouds. This work emphasizes the importance of applying detailed and adaptive models to the complex data generated by observations of highly active regions.

Keyword-1

Star Formation

Keyword-2

Astronomy

Keyword-3

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