High-Mass Star Formation in Three Southern, Galactic Cores

Georgii Chunev (Manchester College), Christopher Watson (Manchester College), GLIMPSE Team

ABSTRACT

Using primarily data from 2MASS and GLIMPSE we examined three high-mass, southern, star-forming regions (central coordinates: G316.75-0.08, G327.30-0.58, G321.05-0.50) at 2.2µm, 1.6µm, 1.25µm, and 2.1µm. We interpret the use of a 2D (age and dust extinction) grid allows us to statistically analyze these regions on a wide range of scales. We utilize the grid's spatial resolution along with extinction extinction to escape spatial energy distributions for protostellar candidates and put upper limits on YSO evolutionary stages, construct H2 column density images, and measure preferential protostellar spacings within the fitting parameter. The analysis of variations in the distribution of such sources reveals that the mass function is not well-behaved and shows the presence of a second population of YSOs.

INTRODUCTION

The study of star formation was one of the main goals of the GLIMPSE project, which mapped the inner Galactic Galaxy (90°< l <110°) in the K band in 2008, 2009, and 2010. The survey data includes the Pismis and Perseus Star Catalog (Machu et al. 2008) as well as the Pismis Entry Legacy Program (PEL). The program used a large grid of models (Whitney et al. 2006) and, when successful, we have identified regions of interest for further study.

CONCLUSIONS

- There is strong evidence that G316 is a core with a distinct population of YSOs.
- In G327, the region of highest star formation is embedded in a dense molecular cloud and exhibits the presence of YSOs.
- G321 seems to be too large and distant for an accurate analysis.
- We have increased star formation in the vicinity of massive O and B stars, found directly from high-mass star-forming regions.
- Among the detected high-mass protostars the most massive are those with diameters less than 0.35 pc, and we have identified several associated stars (G316.75-0.08).
- The model fit did not give the best results, and we need further analysis of the associated stars.
- The model fit did not give the best results, and we need further analysis of the associated stars.
- The model fit did not give the best results, and we need further analysis of the associated stars.