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MASSIVE STAR FORMATION IN NGC6334-NGC6357 PRELIMINARY RESULTS

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Abstract. On the basis of the extinction map a survey of NGC6334-6357 at 1.3 mm continuum has been done in order to find high density cores. 163 dense cores (volume-averaged density $<n_{H_2}>\sim 2.4\ 10^4$ cm^{-3}) have been detected among which 34 are massive (M $\geq$100 M$_\odot$).

1 Introduction

We are looking for the earliest phases of the high-mass stars in the star-forming complex NGC6334-6357. These are supposed to be cold, high-density and IR-quiet objects. On the basis of the extinction map (Bontemps, private communication) a survey of NGC6334-6357 at 1.3 mm continuum has been done (fig. 1) in order to find high density cores following a multiresolution analysis developed by Motte et al. (2007). 163 dense cores have been detected, for which we looked for IR counterpart using Spitzer IRAC/GLIMPSE and MIPSGAL 24μm data.

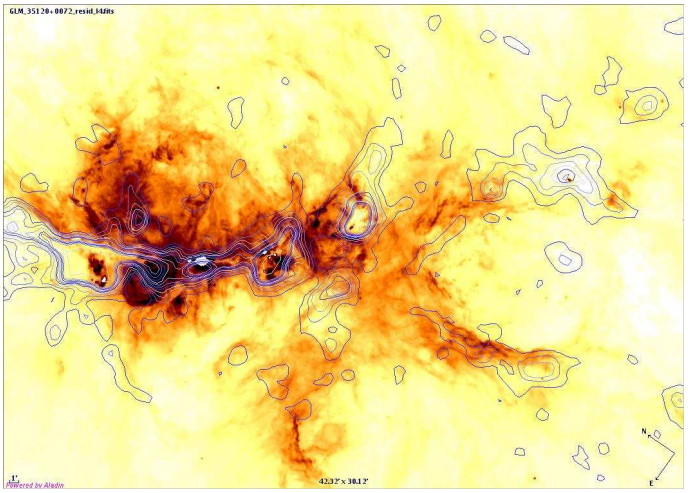

Fig. 1. Spitzer-IRAC (8μm) image of NGC6334 superimposed with SIMBA 1.3mm isocontours (Muñoz et al. 2007).

2 The results

The majority of the cores (120 on 163 detected) show no IR counterpart up to 24μm (fig. 2). The most massive infrared-quiet cores (M $\geq$100 M$_\odot$) are good candidates for either massive pre-stellar cores or the equivalent to classical "class 0" objects.

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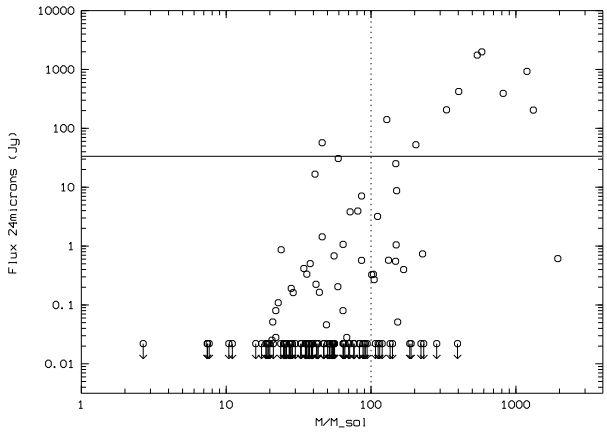

Fig. 2. Flux 24μm (aperture photometry on MIPS images) versus mass (determined from 1.3mm data and corrected from free-free emission). The line is the flux limit to have a B3 stellar core embedded in the dense core. This line separate the infrared-quiet (below the line) from the infrared-loud cores. The dashed line displays the mass limit we have assumed necessary for a core of 0.3 pc size to be able to form a massive star.

For cores with IR counterpart a trend is seen (fig. 2) in agreement with the fact that the more massive the proto-star, the more intense the warm dust emission in the core.

The slope of the core mass distribution (fig. 3) of NGC 6334 seems to be slightly different from that of NGC 6357. One can note that NGC 6334 exhibits more massive cores than NGC6357. This will be compared (in future works) with the different internal kinematics observed in both HII regions.

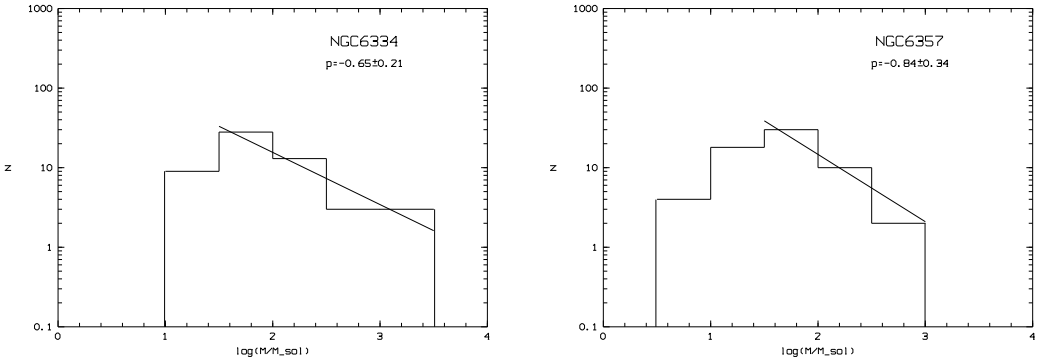

Fig. 3. Mass histogram of the cores in NGC6334 (left) and NGC6357 (right). The bin size has a constant value of 0.5M$_\odot$. The low mass completeness limit is estimated to be $\sim$30M$_\odot$.

Finally, the 24 massive and infrared-quiet objects are either infrared-quiet proto-star or pre-stellar cores without star. The search for associated classical tracers of stellar activity (maser emission, centimeter free-free emission, SiO, mid-infrared) is in progress. These are also excellent targets to observe with Herschel (HOBYS GT program, PIs: F. Motte, A. Zavagno, S. Bontemps) and ALMA in order to precise their nature.

References

Motte F., Bontemps S.,Schilke P., et al. 2007, A&A, 476, 1243
Munoz D., Mardones D., Garray G., et al. 2007, ApJ, 668, 906