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Clumps in Lynds 935

Shaobo Zhang, Ye Xu and Ji Yang

Purple Mountain Observatory, Chinese Academy of Sciences, Nanjing, China
email: shbzhang@pmo.ac.cn

Abstract. We present a map of CO clumps of Lynds 935 and investigate their physical properties.

Keywords. ISM: molecules — ISM: clouds — stars: formation — radio lines: ISM

Lynds 935 is a nearby, cold and dense dark cloud (∼0.6 kpc, <20 K, $>10^4$ cm^{-3}, Guieu *et al.* 2009) which provides an ideal laboratory to study clumping in the early stage of massive star formation. We observed simultaneously three J=1-0 transitions of ^{12}CO, ^{13}CO and C^{18}O toward Lynds 935 with Delingha 13.7 m telescope, which equips a 9-beam superconducting array receiver. This observation is part of the large scientific project, Milky Way Imaging Scroll Painting (MWISP) project.

We apply the ClumpFind algorithm in the Starlink package with parameter TLOW = 5×RMS and DELTAT = 3×RMS to identify molecular clumps in the obtained ^{13}CO FITS cube. Total 632 clumps are identified after checking on the channel map. Non-thermal component dominates the velocity dispersion of these cold clumps. The power index of the clump mass function (CMF) is 1.09, lower than the stellar initial mass function (IMF) of 1.35 (Salpeter 1955). There are 22.8% clumps associating with YSOs. These clumps show larger physical size, velocity dispersion and higher kinetic temperature than the clumps with no YSO, while CMF power indexes of these two groups present no significant difference.

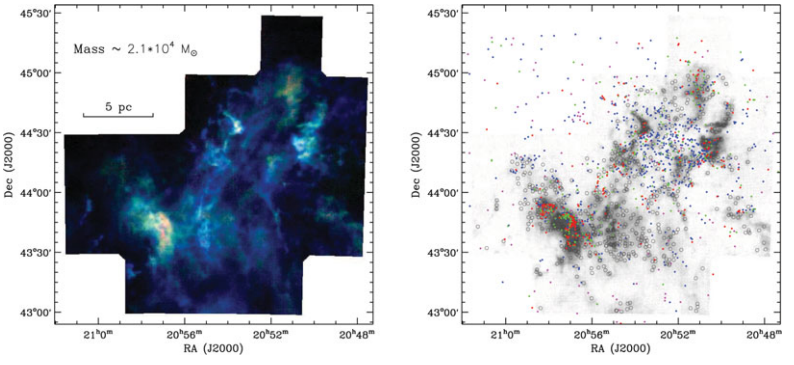

Figure 1. Left: The composite color image of Lynds 935 made from the integrated intensity map of ^{12}CO/^{13}CO/C^{18}O, where ^{12}CO in blue, ^{13}CO in green, and C^{18}O in red, respectively. Right: Clumps and YSOs on the integrated intensity map of ^{13}CO. The black circles indicate the clump position. Dots are YSOs identified by Guieu *et al.* 2009. Red is Class I, green is Flat, blue is Class II, purple is Class III (a color version of this figure is available online).

References

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