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A study of the cold cores population in the Perseus star-forming regions

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Abstract. As part of the Herschel Gould Belt survey, the Perseus star-forming cloud was observed with the Herschel PACS and SPIRE instruments. Source catalogs are preliminary, as well as the here presented core mass function.

1. Introduction

The complex of star-forming regions in Perseus is located at distances of ~250–300 pc. It hosts a number of well-known sites of active star formation like NGC 1333, L1448, L1455, B1, IC348. Perseus was observed as part of the Herschel Gould Belt survey (HGBS, André et al. 2010) which aims at obtaining a complete census of prestellar cores and Class 0 sources in the closest star-forming regions. The survey was carried out with the Herschel (Pilbratt et al. 2010) instruments PACS (Poglitsch et al. 2010) and SPIRE (Griffin et al. 2010). These data have been already exploited in a few papers: Sadavoy et al. (2012) made a multiwavelength study of a few young sources in B1-E; Pezzuto et al. (2012) reported on the analysis of the SED of B1-bS and B1-bN, two first hydrostatic cores candidates; Sadavoy et al. (2014) identified a first list of Class 0 protostars. In Figure 1 we show the column density map derived from our observations.

2. Sources extraction and photometry

Compact sources have been identified and their flux measured with *getsources* (Men'shchikov et al. 2012). Not-reliable sources have been removed and the resulting list has been cross-checked with external databases (NED, WISE, Spitzer, Simbad) to remove possible contaminants. A detailed description of the selec-

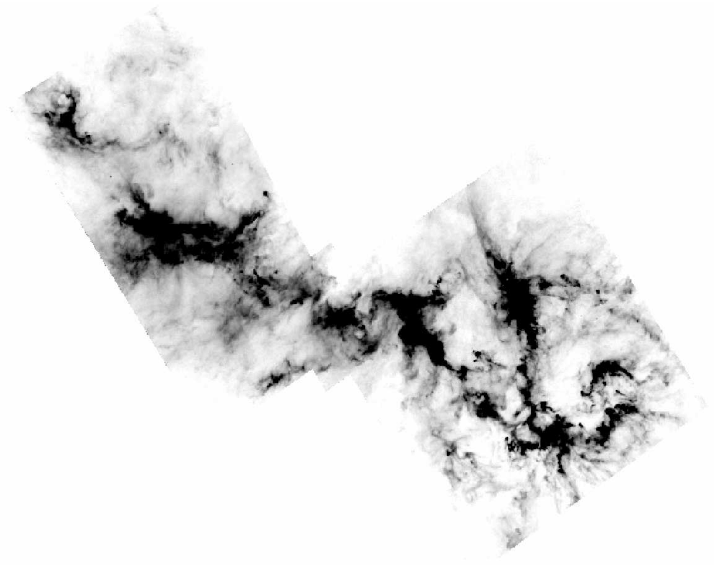

Fig. 1. The column density map of the Perseus complex; black areas are denser. The molecular hydrogen column density runs from $2.5 \cdot 10^{20}$ cm^{-2} up to $1.4 \cdot 10^{23}$ cm^{-2}.

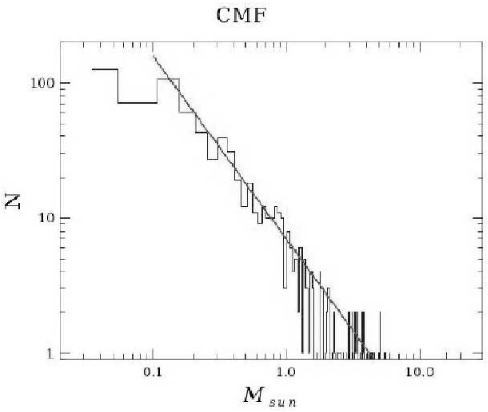

Fig. 2. The CMF for Perseus: the Salpeter law d$N \propto M^{-1.35}$, arbitrarily scaled, is shown for comparison.

tion procedure can be found in Könyves et al. (2015, hereinafter Paper I). A tentative list of 838 sources has been generated; 94% are robust identifications since they are also found with another code (*CuTEx*, Molinari et al. 2011). In particular, 37% are spatially coincident, within 6″, and 57% fall within the elliptical size of the sources computed by *getsources* at 250 μm.

3. Conclusions

For all the 743 (89%) starless cores having reliable SED fits (see Paper I), in Figure 2 we show a preliminary CMF (dN/dlog$M$); 62% (461 out of 743) are provisionally identified as gravitationally bound. The ongoing analysis is finalized to make the catalog more robust, by identifying and excluding spurious sources, especially at the low-mass end of the CMF.

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