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

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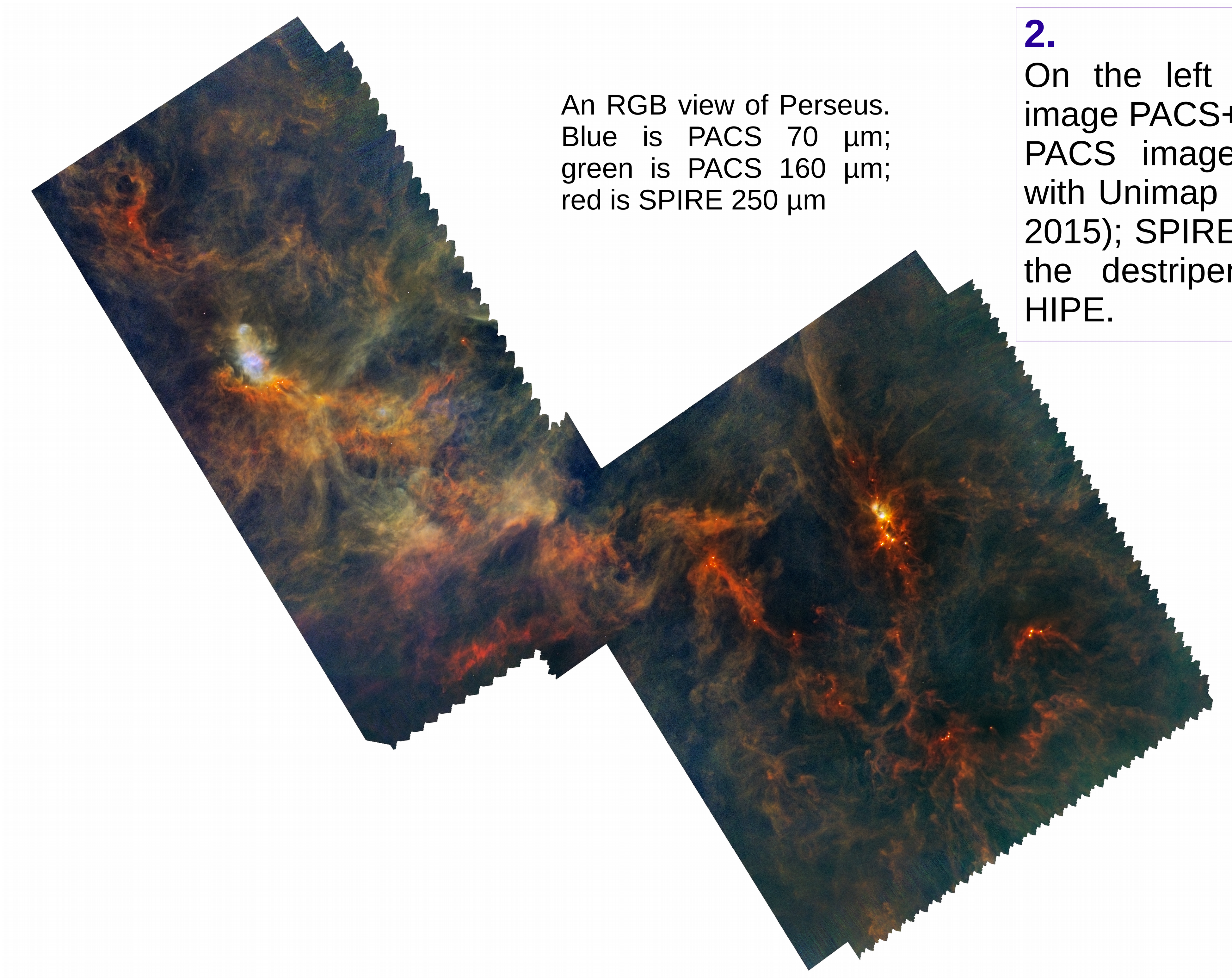
As part of the Herschel Gould Belt survey, the Perseus star-forming cloud was observed with the *Herschel* PACS and SPIRE instruments. Sources catalog is almost ready and will be published in a short time; the preliminar Core Mass Function is here presented.

1.

The star forming region in Perseus is located at an average distance of ~250 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** (GBS, André et al. 2010) which aims to obtain a complete census of pre-stellar cores and Class 0 sources in the closest star-forming regions. The survey was executed with the *Herschel* (Pilbratt et al. 2010) instruments *PACS* (Poglitsch et al. 2010) and *SPIRE* (Griffin et al. 2010, Swinyard 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.



An RGB view of Perseus. Blue is PACS 70 µm; green is PACS 160 µm; red is SPIRE 250 µm

2.

On the left a composite image PACS+SPIRE. PACS images generated with Unimap (Piazzo et al. 2015); SPIRE images with the destriper module in HIPE.

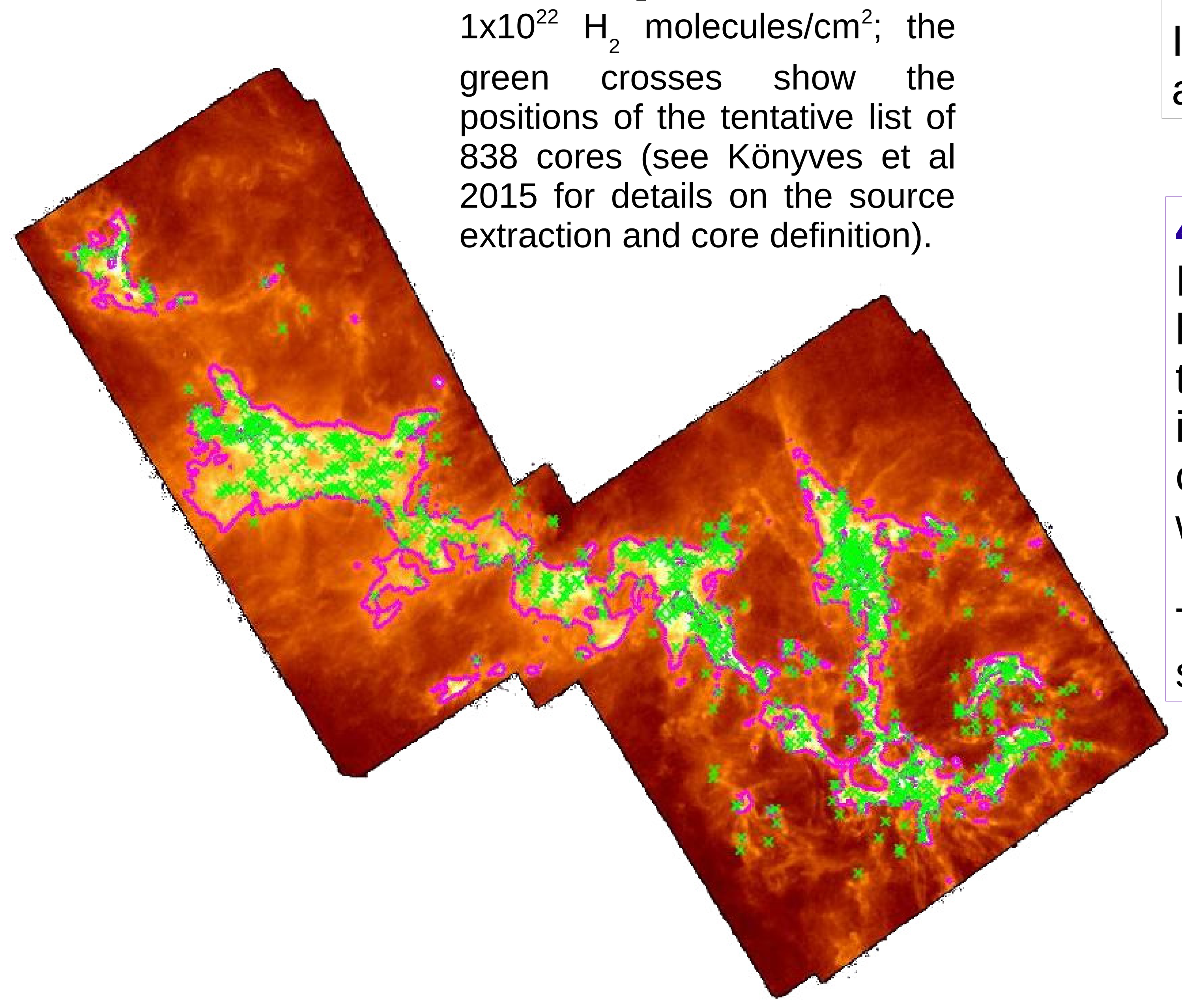
3.

Sources have been identified and 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 contaminant. A detailed description of the selection procedure can be found in Könyves et al. (2015).

A tentative list of 838 sources has been generated; 37% are spatially coincident, within 6", with those found with the CuTEx code (Molinari et al. 2011), another 57% is within the elliptical size of the sources computed by getsources at 250 µm.

In the figure on the left, the positions of the 838 sources are shown as x's, overlapped on the column density maps.

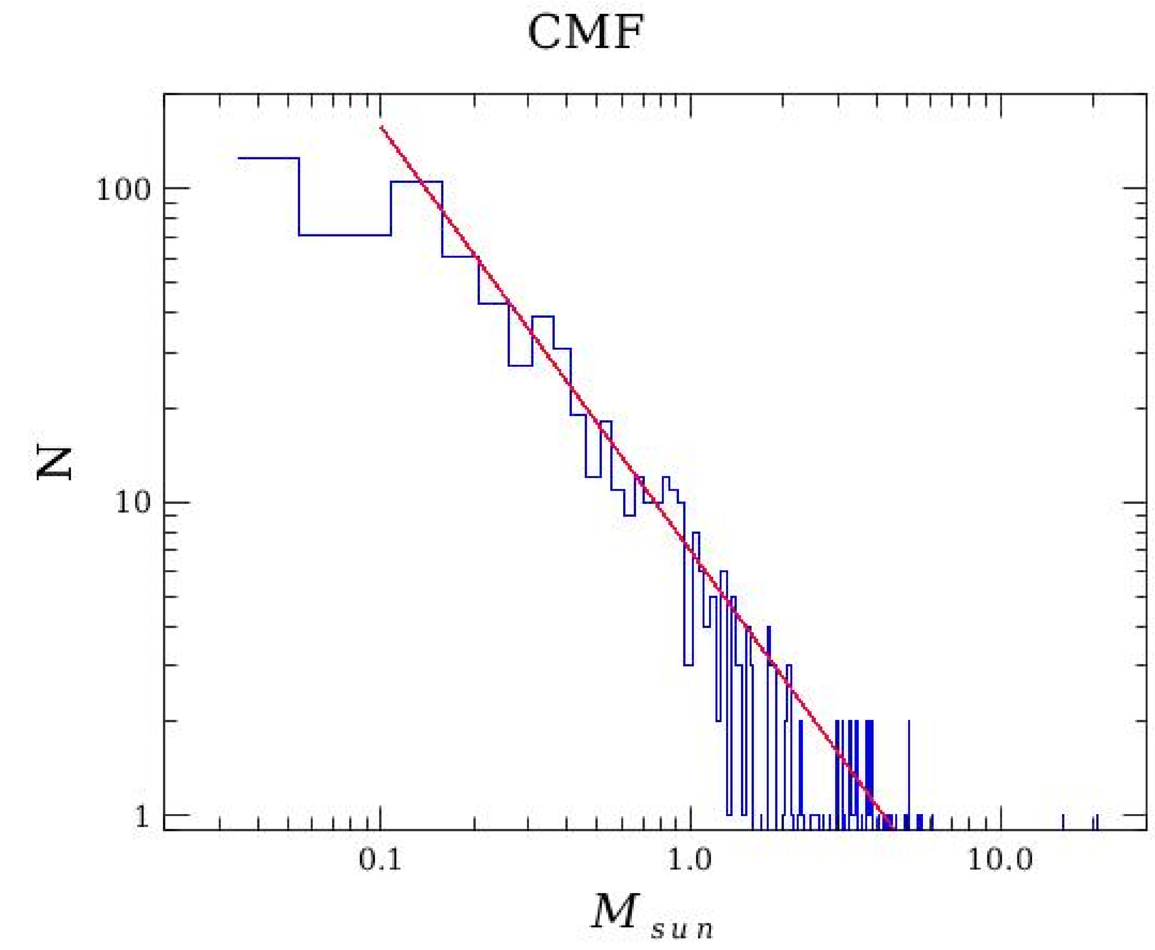
The column density maps of the Perseus star-forming region. Magenta contours are at 3×10^{21} H_2 molecules/cm^2 and 1×10^{22} H_2 molecules/cm^2; the green crosses show the positions of the tentative list of 838 cores (see Könyves et al 2015 for details on the source extraction and core definition).



4.

In the figure below we show the Core Mass Function for the sources having reliable fits (743 or 89%, see again Könyves et al. 2015 for the definition of a reliable fit); 62% of the cores are provisionally identified as bound. The ongoing anaysis is finalized to make the catalog more robust, especially at the low-mass end of the CFM where a few sources may be spurious.

The red line represents the Salpeter law dN α $M^{-1.35}$, arbitrarily scaled.



5.

A full discussion of the cores physical properties as well as of the whole region is under preparation (expected by March 2018). A few changes in the final catalog expected.

If interested in the flux densities or in the physical properties of some sources, please contact the author.

References:

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