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

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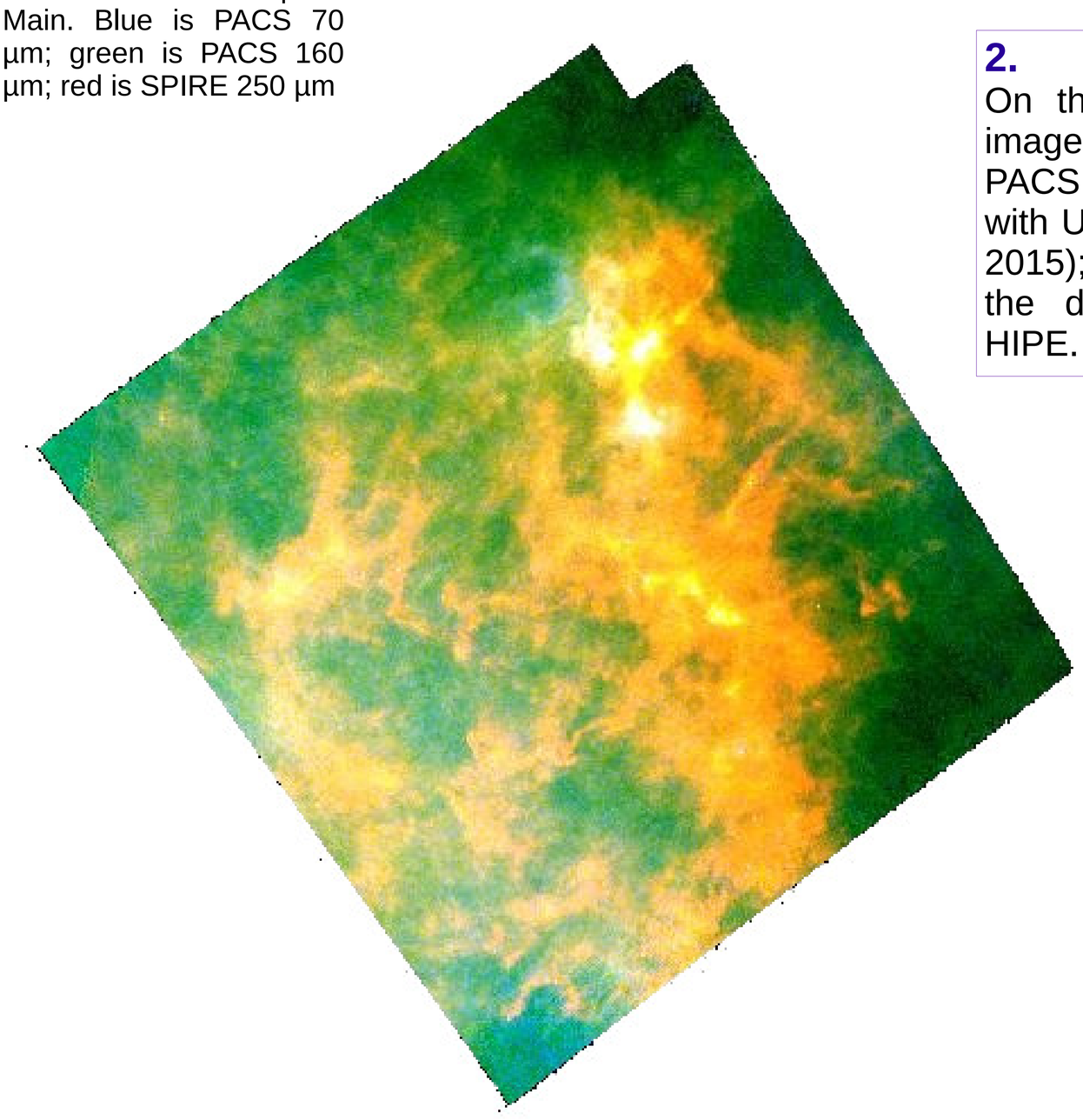
As part of the Herschel Gould Belt survey, the Serpens star-forming region was observed with the *Herschel* PACS and SPIRE instruments. Data analysis is ongoing and a first version of the source catalog is ready; here we show some preliminary results.

1.
The Serpens star-forming region 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).

Traditionally, this region is divided in two main fields: Serpens Main and South, we observed both.
Their distance is a matter of controversy: recently Ortiz-León et al. (2016) has derived an average distance of ~436 pc similar to the ~415 pc previously known (Dzib et al. 2010) but distances as small as 230 pc are reported in literature. In this work we adopted 415 pc.

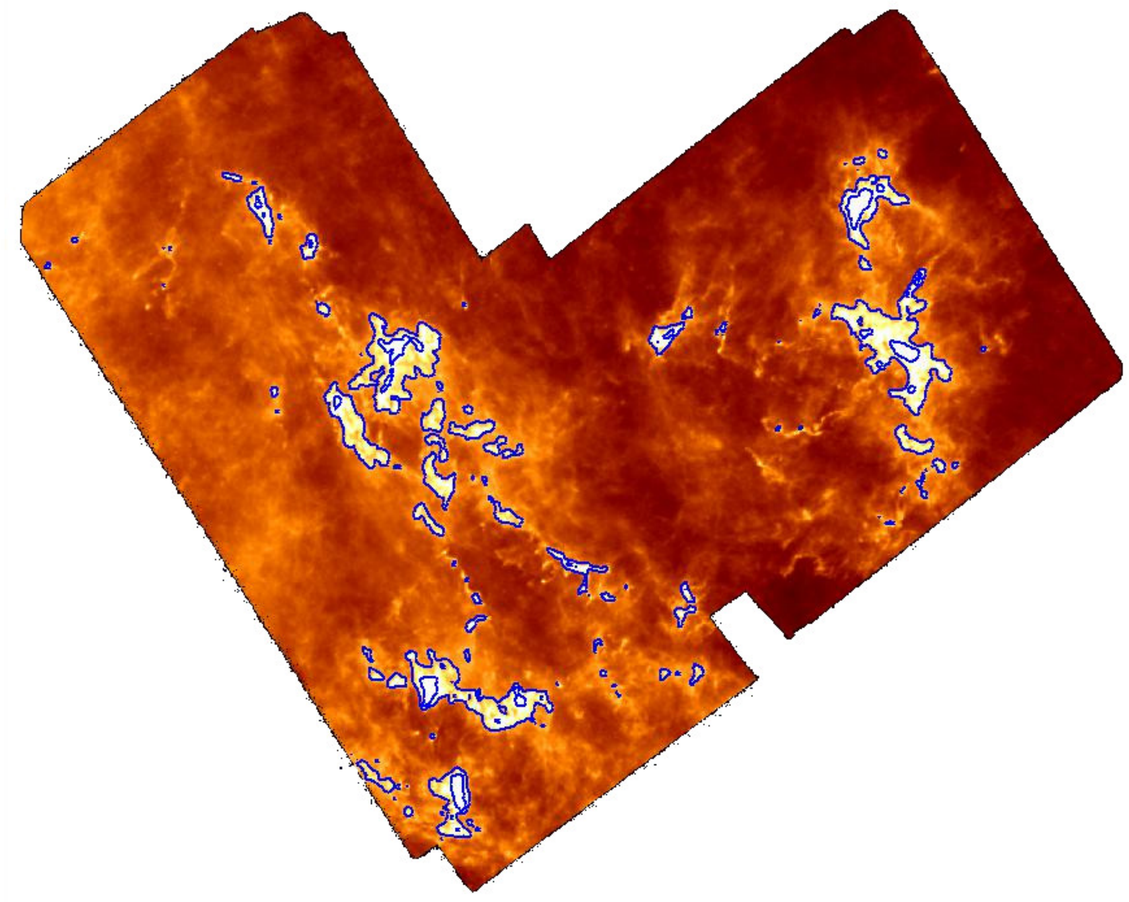
In this poster I present the first results of data analysis of this region, part of my degree thesis at Università di Roma "La Sapienza" to be discussed in July 2017.

An RGB view of Serpens Main. 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.

The column density maps of the Serpens star-forming region.
In blue are shown the contours at 4.5×10^{21} H_2 molecules/cm^2 and 1×10^{22} H_2 molecules/cm^2.



3.
Maps were calibrated for the zero-level of the diffuse dust emission following the procedure given by Bernard et al. (2010); intensity maps at 160, 250, 350 and 500 µm were used to compute the H_2 density column map, shown in the figure on the left for both Serpens Main and South.

All the intensity maps plus two auxiliary maps (see Könyves et al. 2015, for details) were used to identify and to measure candidate sources; to this aim we adopted the *getsources* code (Men'shchikov et al. 2012).

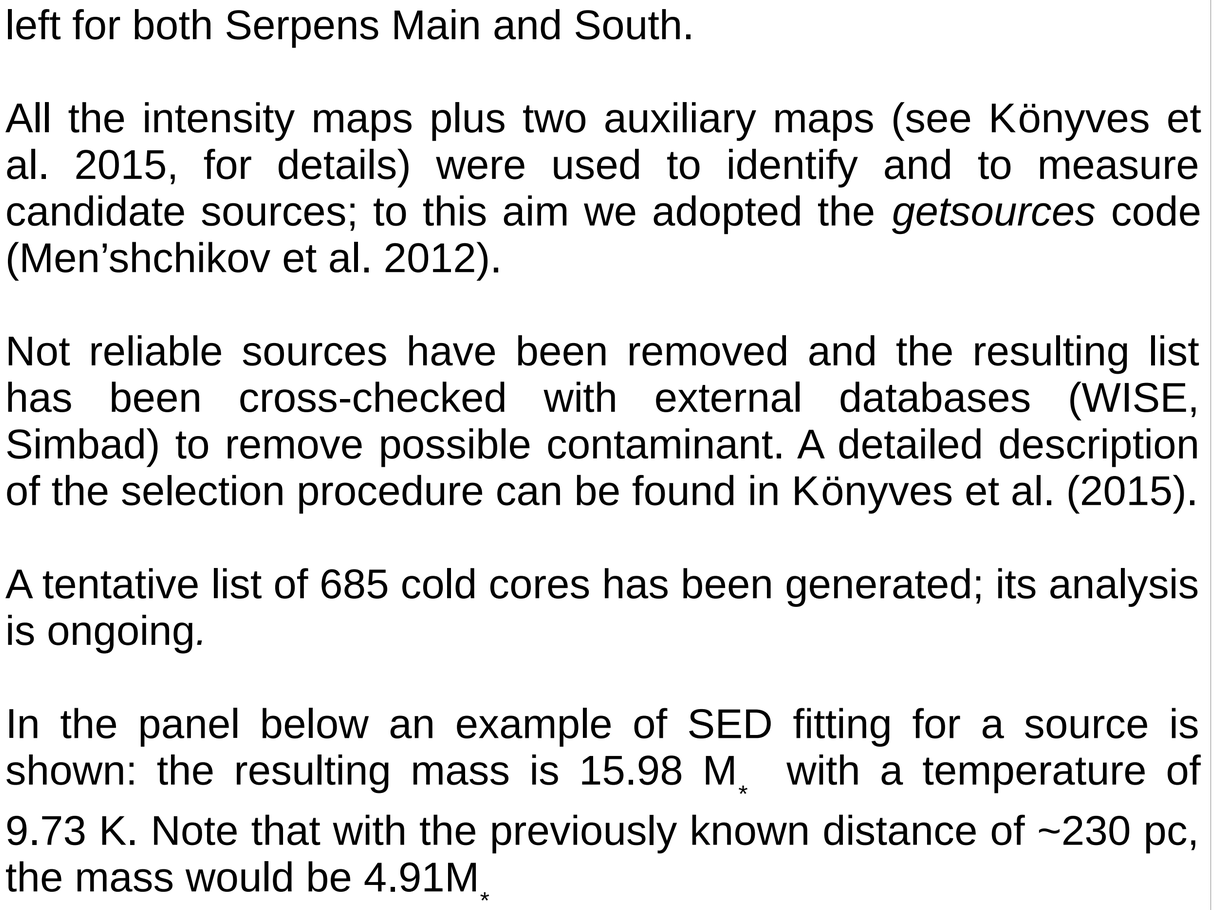
Not reliable sources have been removed and the resulting list has been cross-checked with external databases (WISE, Simbad) to remove possible contaminant. A detailed description of the selection procedure can be found in Könyves et al. (2015).

A tentative list of 685 cold cores has been generated; its analysis is ongoing.

In the panel below an example of SED fitting for a source is shown: the resulting mass is 15.98 M_* with a temperature of 9.73 K. Note that with the previously known distance of ~230 pc, the mass would be 4.91M_*

4.
A full discussion of the cores physical properties as well as of the whole region is under preparation (expected March 2018).

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



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