UNIVERSITY OF HELSINKI

THE 'GALACTIC COLD CORES' PROGRAMME:
THE PROPERTIES OF COLD CORES REVEALED BY HERSCHEL

Julien Montillaud[1], M. Juvela[1], V-M. Pelkonen[2], I. Ristorcelli[3,4] & Collaboration KP-Galactic Cold cores

[1]University of Helsinki, Department of Physics, julien.montillaud@helsinki.fi
[2]Finnish Center for Astronomy with ESO (FINCA)
[3]Université de Toulouse, UPS-OMP, IRAP, Toulouse, France
[4]CNRS, IRAP, 9 Av. colonel Roche, BP 44346, 31028, Toulouse Cedex 4, France
https://wiki.helsinki.fi/display/PlanckHerschel/The+Cold+Cores

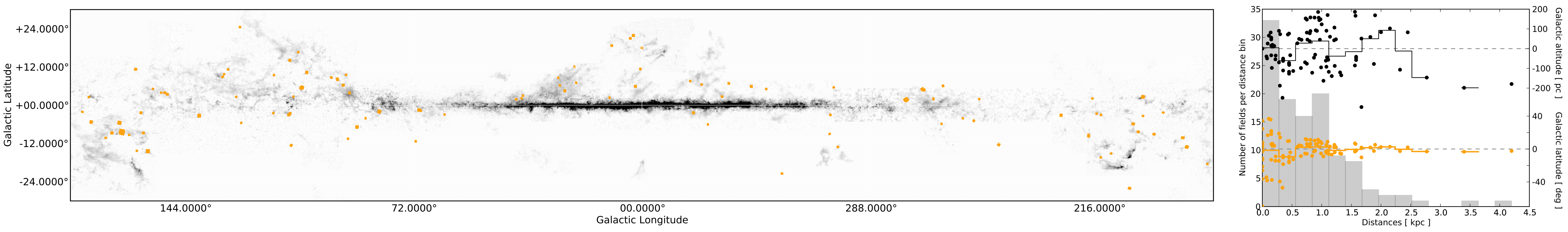

Figure 1: *Left* Positions of fields observed with *Herschel* on top of the CO map of the Galaxy from Dame et al.'s survey. *Right* Distribution of field distances compared to galactic latitudes and altitudes.

HERSCHEL'S FIELDS

The *Planck* satellite all-sky sub-millimeter survey was analysed to build a catalog of cold clumps that contains more than 10000 sources. A subset of this catalog was selected in order to sample the galactic plane, as well as the distances ($\sim$0.1 to 4 kpc), dust temperatures ($\sim$6 to 14 K) and masses ($\sim$0.01 to $10^6 M_\odot$) and observed with the *Herschel* Space Observatory with PACS (100 and 160 μm) and SPIRE (250, 350 and 500 μm).

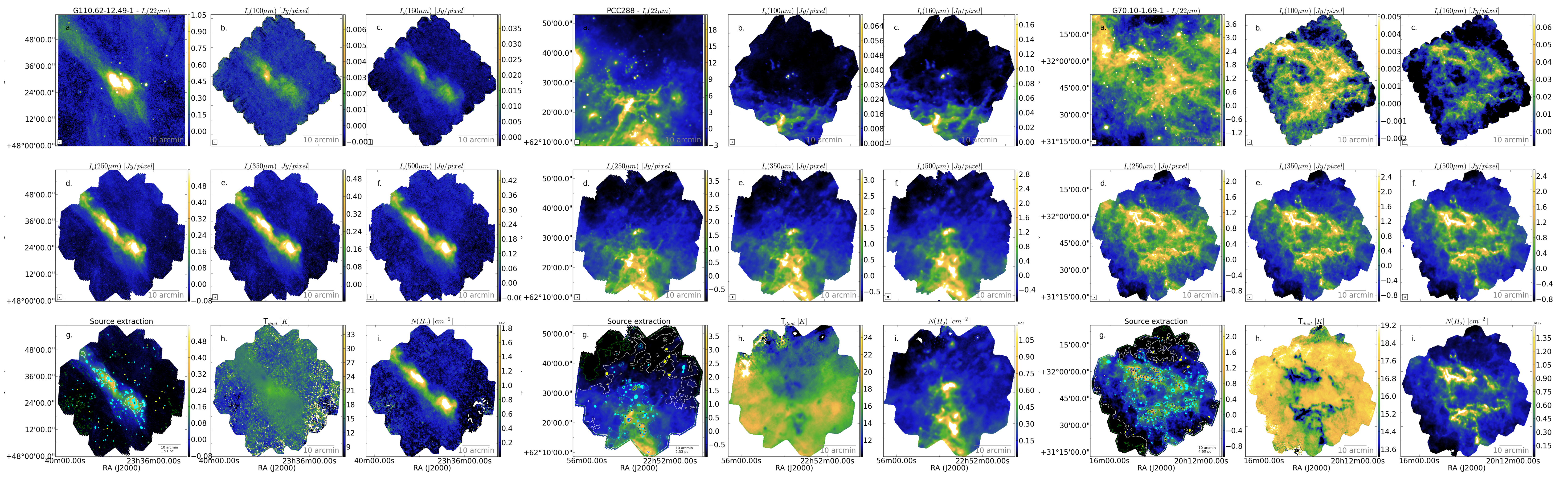

Figure 2: Maps of three fields observed for the GCC programme. *Left:* G110p62-12p49-1 (isolated cloud), *middle:* PCC288 (complex cloud) and *right:* G70p10-1p69-1 (filamentary and complex). Shown are the 22μm WISE surface brightness map (frame **a**), the 100μm PACS surface brightness map (frame **b**), the 160μm PACS surface brightness map (frame **c**), the 250μm SPIRE surface brightness map (frame **d**), the 350μm SPIRE surface brightness map (frame **e**), the 500μm SPIRE surface brightness map (frame **f**), the extracted sources (frame **g**, cyan, yellow=high-low background column density, cross=detection at 22 and/or 100 μm), the dust color temperature derived from SPIRE data (frame **h**), and the H_2 column density derived from SPIRE data (frame **i**). The respective beam sizes are indicated in the lower left hand corner of each surface brightness map.

PROPERTIES OF COLD CORES

The algorythm *GetSources* (Men'shchikov et al. 2012) was used to extract compact sources from WISE (22μm) and *Herschel* data. After fitting the spectral energy distribution for SPIRE bands, masses and temperatures of sources were computed. The galactic environment and morphology of fields seem to influence these values, but present results are limited by the uncertainties due to the scatter of distances. Future studies will evaluate these uncertainties.

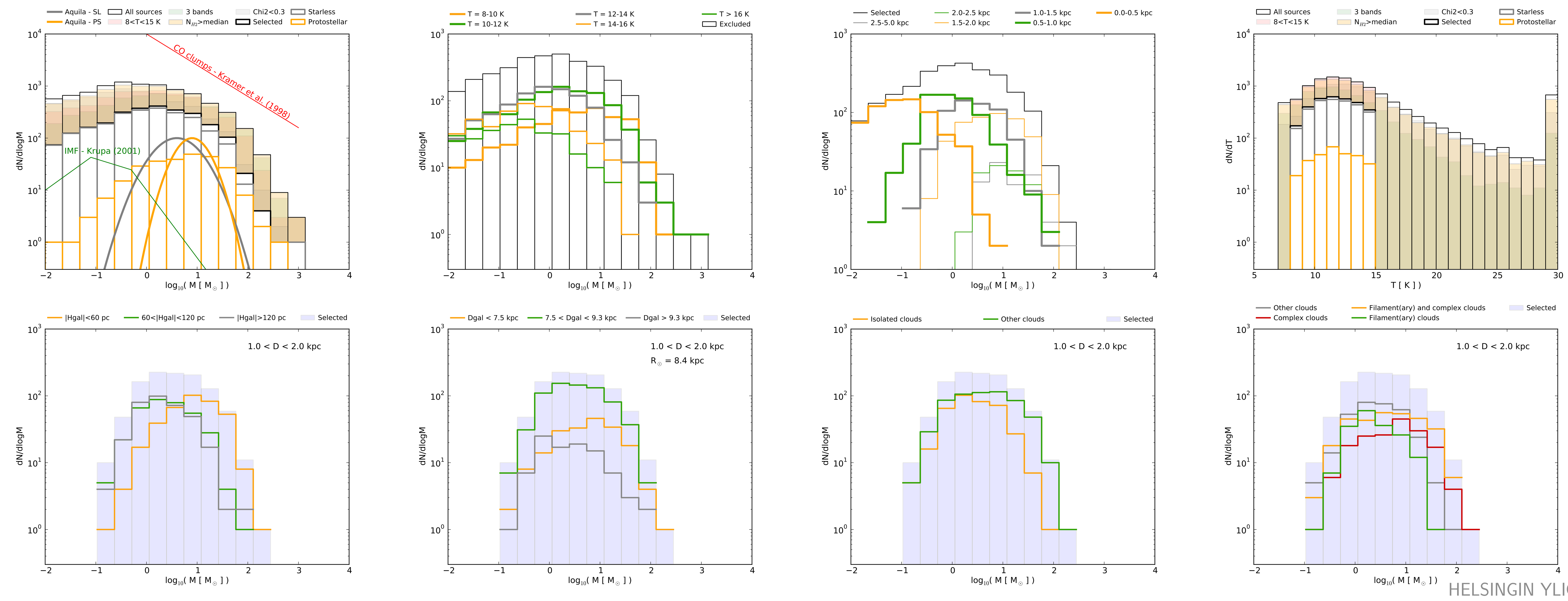

Figure 3: Mass and temperature distributions of sources extracted from GCC *Herschel* maps are shown along with results for the Aquila field (Könyves et al. 2010).