POSTER

ABSTRACT

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Origin of high-mass stars in Cygnus-X

To understand the earliest phases of the formation of high-mass stars, systematic, high angular resolution studies are required, which resolve individual collapsing objects. Located at a distance of ~1.7 kpc, Cygnus X offers the opportunity to perform such studies.

On a sample of 5 IR-quiet Massive Dense Cores (MDCs), selected from the unbiased survey at 1mm continuum (Motte et al. 2007), we obtained high angular resolution observations both in continuum and in high-density molecular gas tracers reaching individual collapsing objects at size scales of 2000-5000 AU. Bontemps et al. (2010) showed that the MDCs are fragmented into a few massive protostars and are surrounded by only a few lower mass fragments. Csengeri et al. (2010) studied the kinematics of the dense mass reservoir surrounding these massive fragments, and which indicates that highly dynamical processes may govern their evolution.

This systematic approach was complemented with an extensive survey on a specific site, a massive clump associated with DR21(OH), which actually contains 3 MDCs, one hosting DR21(OH) and two other, which seem to be in an earlier evolutionary stage. The MDCs within this cluster-forming clump show similar fragmentation properties as the isolated MDCs, and the clump itself is found to be in a hierarchical and continuous star-forming state. Herschel will provide a key tool to systematically identify and complete our sample of dense and cold star-forming sites within Cygnus X, which will serve as a perfect sample for high-angular resolution follow up surveys on a homogenous, unbiased sample.