Tracing the evolution of high-mass protostars with ALMA: Fragmentation and clustering properties.

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The formation mechanism of high-mass stars still lacks a coherent evolutionary timeline comparable to the well studied mechanism observed for low-mass stars. To address this we have preformed an ALMA survey toward 38 colour-luminosity selected sample ($L_* > 3{\times}10^3$ $L_\odot$) of nearby (<5kpc) young high mass embedded protostellar sources which will eventually go on to form high-mass stars. The survey aims to study the properties of both the thermal dust and selected organic molecular species in the protostellar objects as they begin to heat their surroundings allowing us to identify evolutionary trends. We will present the results of the dust continuum emission from the sources, including analysis of the protocluster populations, the clustering and fragmentation within the observed systems, and observed spectral energy distribution properties of all protostellar sources. Our findings include that the observed fields are densely populated with ∼90% of sources having a neighbour within 0.1pc, each field has a single source dominating the flux density budget (83% of the sample have less than 20% of the observed emission) and that higher luminosity potentially more evolved fields have smaller, therefore less elongated, cluster axis ratios.

Clusters