

P111a Core evolution in 70 μm -dark High-mass Clumps

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The very early evolutionary stage of high-mass star and cluster formation is a key phase for understanding how the progenitors of stars form and evolve. We have conducted the ALMA Survey of 70 μm Dark High-mass Clumps in Early Stages (ASHES) toward thirty-nine cold regions with dense molecular gas, which are thought to be the ideal sites to investigate the early phase of star formation. Thanks to high-resolution (~ 0.02 pc) and high-sensitivity observations, we succeeded in intensifying 839 cores, the largest sample in infrared-dark clumps. We find more than half (60%) of cores without star-forming signatures (i.e., prestellar core candidates) and about 10% of cores associated with molecular outflows traced by CO($J=2-1$) (i.e., protostellar cores). Comparing the virial parameters of these cores, we find a continuous increase of gravitational boundness from the prestellar to the protostellar phase. We find that protostellar cores are more massive than prestellar cores as far as the protostellar core temperature is lower than 25 K, implying their growth in mass. We will make our first presentation about the comparison between the pre- and protostellar core properties using the full sample of ASHES.