

Abstract Submitted
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Exploring the Evolutionary Stages of Massive Star Formation

MENGYAO LIU, JONATHAN TAN, University of Florida, SHUO KONG, Yale University — Massive stars play a key role in the regulation of galactic environments. However, there is little consensus on the basic formation mechanism of massive stars. Theories range from Core Accretion, which is approximately a scaled-up version of low-mass star formation, to Competitive Accretion in which massive stars form hand in hand with star clusters, to Protostellar Collisions. A detailed multi-wavelength comparison between theoretical models and observations of massive protostars will help advance our understanding of the massive star formation process. Here we present multi-wavelength observations of a series of high and intermediate-mass protostellar candidates that are expected to span a wide range of the evolutionary sequence. We characterize the early-stage sample with SiO outflows observed by ALMA. The different morphology and kinematics of the outflows indicate different core structures, accretion histories and ambient cloud environments. For more evolved stages, we focus on mid and far infrared data observed by SOFIA. The spectral energy distributions (SEDs) of the protostars are used to constrain detailed radiative transfer models that test massive star formation theories.

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