DISK-OUTFLOW SYSTEM AROUND A MASSIVE PROTOSTAR

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There are two major competing models for massive star formation: accretion via disks and coalescence of low-mass (proto)stars. The presence of well-defined disks around massive protostars may be the most convincing observational evidence to support the accretion model. We observed a massive protostar in the $H^{13}CO^+$ and $H^{13}CN$ (1−0) lines and 3-mm continuum at $4''$ resolution using the BIMA array, and detected a well-elongated dense condensation in the NE-SW direction. Dust continuum emission peaks around its center where a bright ($\sim 4\times10^4$ $L_\odot$) IRAS point source is located. The condensation crosses the associated outflow axis at about 50°. A large ($\sim$15 km s^{-1} pc^{-1}) velocity gradient exists along the major axis, suggesting rotation. The condensation has a size of 50000 AU and a mass of 400 $M_\odot$, which are very similar to those of the circumstellar disk recently detected around NGC 7538S. Therefore, this structure seems to be a circumstellar disk around a massive protostar, although further studies are required to confirm this.