PROBING CIRCUMSTELLAR MOLECULAR GAS IN THE STAR-FORMING REGION BD $+40^o$ 4124

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As a well known cluster system that has simultaneous low and high-mass star formation, the BD $+40^o$ 4124 region can provide an interesting laboratory for star formation studies. The cluster associated with BD $+40^o$ 4124, a Herbig Be star at a distance of 1 kpc, includes two other optically visible young stars, V 1686 Cygni and V1318 Cygni, and several embedded IR sources. We present the BIMA interferometric images of CS $J = 2 - 1$, ^{13}CO $J = 1 - 0$, and C^{18}O $J = 1 - 0$ to probe the molecular gas distribution and morphology and derive the gas column density and molecular mass. By comparsion with near infrared observations, we identify more embedded sources showing ongoing star-forming activities and study the formation mechanism and interaction between the high mass star and low mass companions. Finally, the impact to general star formation will be discussed.