P31a

Modeling of Massive Star Formation Sites Using 2-D Radiative Transfer Calculations

○ Sese, Rogel Mari(University of Tsukuba), Nakamoto, Taishi (Tokyo Institute of Technology) and Umemura, Masayuki (University of Tsukuba)

The formation of massive stars is one of the major unresolved problems in astrophysics. Unlike their low-mass counterparts, radiation from the central protostar hinders the accretion of material from the surrounding envelope. However, recent observational evidences showed the existence of disk-like structures around massive protostellar candidates. These structures are often found perpendicular to outflows, which show that massive circumstellar disks may be present. In our work, we have developed a 2-D radiative transfer code for massive circumstellar disks using flux-limited diffusion (FLD) approximation. From our simulations, we have shown the disk radiates most of its energy in the far-infrared range (typically from 50μ to 1 mm) as a result of re-processed radiation from the central star to the disk interior. Despite the disk inner radius reaching 1500K, it is almost obscured by the disk outer region in the edge-on view. Furthermore, we showed that based on the SED, we can infer basic disk parameters such as disk mass and density distribution. We believe that our work may be used to infer circumstellar disk parameters from physical observables.