P13b Relative Evolutionary Time Scale of Hot Molecular Cores with Respect to Ultra Compact HII Regions

○古屋 玲 (Caltech)、他 8 名

Using the Owens Valley and Nobeyama Radio Observatory mm-interferometers, we carried out an unbiased search for hot molecular cores and ultracompact (UC) HII regions toward the high-mass star forming region G19.61–0.23 at d of 3.5 kpc. In addition, we performed 1.2 mm imaging with SIMBA on SEST, and retrieved 3.5 and 2 cm images from the VLA archive data base. The newly obtained 3 mm image brings information on a cluster of high-mass (proto)stars located in the innermost and densest part of the parsec scale clump detected in the 1.2 mm continuum. We identify a total of 10 high-mass young stellar objects: one hot core (HC) and 9 UC HII regions, whose physical parameters are obtained from model fits to their continuum spectra. The presence of the HC is fully confirmed by our recent Submillimeter Array (SMA) observations at 860 μm. The ratio between the current and expected final radii of the UC HII regions ranges from 0.3 to 0.9, which leaves the possibility that all O-B stars formed simultaneously. Under the opposite assumption — namely that star formation occurred randomly — we estimate that HC lifetime is less than $\sim$1/3 of that of UC HII regions on the basis of the source number ratio between them. In addition to the above findings reported in Furuya et al. 2005, ApJ, 624, 827, preliminary results from SMA, Spitzer Space Telescope and the follow-up VLA observations will be discussed.