P11b OH and H_2O Maser distribution in Orion-KL

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Because of its proximity, 480pc, Orion-KL is one of the most studied high-mass star forming regions in the Galaxy. One of the most interesting and important area of study is the question of the origin of the source of its high luminosity (L$> 10^5\ L_\odot$). Since astrophysical masers are good probes of the kinematical conditions around star forming regions, we have used the VLA to study the OH and H_2O maser emission towards Orion. Orion-KL is also known as one of the few star-forming regions that exhibits SiO maser emission, besides OH and H_2O masers, which seem to be associated with the same strong infrared source IRc2 (cf. Plambeck et al. 1990, ApJ 348, L65). Menten & Reid (1995, ApJ 445, L157) argued that the center of the SiO maser ring does coincide with a compact continuum source standing near IRc2. On the other hand, Torrelles et al. (1996, ApJ 457, L107) suggested that H_2O maser feature around Cepheus A, the other high-mass star-forming region with the thermal radio jet, might be tracing a circumstellar molecular disc of radius $\sim$ 300 AU, nearly perpendicular to the jet. One may hypotheize that masers around Orion-KL are located on similar disc structure and are gravitationally bound by a massive central star with several tens of solar masses. In this paper, in order to study and determine the true powering source behind KL nebula, we discuss our VLA OH and H_2O maser observations of this region and compare their spatial distribution and velocity structure with that of the SiO masers. In addition to the present results, the importance of future VLBI maser polarimetry shall be stressed in order to account for the relation between the slowly expanding rotating disc and the fast outflow. We are planing to set up H_2O maser polarimetry with J-Net with the aid of new VSOP receiver, which will be soon introduced for the Nobeyama 45m telescope.