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A study of the physical environments of evolved stars from the SiO and H2O masers

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We present the long-term observational results of the H2O and SiO masers emitted from the circumstellar envelopes (CSEs) of the evolved stars. Korean VLBI Network (KVN) has observed the stellar masers at four frequency-bands (K, Q, W and D bands) simultaneously since August 2014. The relative spatial distributions between the H2O and SiO masers are precisely determined from the source frequency phase referencing (SFPR) method, which are closely related to the individual masing conditions induced by the physical environments of the inner and outer parts of the CSEs of the evolved stars. The temporal variability of not only the spatial distribution but also the intensity of the stellar masers enable us to trace the physical characteristics of the CSEs along the stellar phase. From our results, the multi-frequency observation of KVN is proved to be powerful to investigate the physical environments and the evolutionary process of the evolved stars.