

Young stellar population and star formation in and around HII regions

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We present a multiwavelength investigation of the young stellar population and star formation activities in the HII region Sharpless 311. Using our deep near-infrared observations and archival *Spitzer*-IRAC observations, we have detected a total of 125 Young Stellar Objects (YSOs) in an area of ~ 86 arcmin². The YSO sample includes 8 Class I and 117 Class II candidate YSOs. The mass completeness of the identified YSO sample is estimated to be $1.0 M_{\odot}$. The ages and masses of the majority of the YSOs are estimated to be in the range ~ 0.1 – 5 Myr and ~ 0.3 – $6 M_{\odot}$, respectively. The $8 \mu\text{m}$ image of S311 displays an approximately spherical cavity around the ionizing source which is possibly created due to the expansion of the HII region. The spatial distribution of YSOs reveals that a significant number of YSOs are distributed systematically along the $8 \mu\text{m}$ emission with a majority clustered around the eastern border of the HII region. Four clumps/compact HII regions are detected in the radio continuum observations at 1280 MHz, which might have been formed during the expansion of the HII region. The estimated dynamical age of the region, main-sequence lifetime of the ionizing source, the spatial distribution and ages of the YSOs indicate triggered star formation in the complex.

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