Two compact H II regions at the remote outskirts of the Magellanic Clouds

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The H II regions LMC N191 and SMC N77 are among the outermost massive star-forming regions in the Magellanic Clouds. So far, few works have dealt with these objects despite their interesting characteristics. We aim at studying various physical properties of these objects regarding their morphology (in the optical and Spitzer IRAC wavelengths), ionized gas emission, nebular chemical abundances, exciting sources, stellar content, age, presence or absence of young stellar objects, etc. This study is based mainly on optical ESO NTT observations, both imaging and spectroscopy, coupled with other archive data, notably Spitzer images (IRAC 3.6, 4.5, 5.8, and 8.0 microns) and 2MASS observations. We show the presence of two compact H II regions, a low-excitation blob (LEB) named LMC N191A and a high-excitation blob (HEB) named SMC N77A, and study their properties and those of their exciting massive stars as far as spectral type and mass are concerned. We also analyze the environmental stellar populations and determine their evolutionary stages. Based on Spitzer IRAC data, we characterize the YSO candidates detected in the direction of these regions. Massive star formation is going on in these young regions with protostars of mass about 10 and 20 $M_{\odot}$ in the process of formation.

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