

Spitzer View of Young Massive Stars in the LMC HII Complex N44

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The HII complex N44 in the Large Magellanic Cloud (LMC) provides an excellent site to perform a detailed study of star formation in a mild starburst, as it hosts three regions of star formation at different evolutionary stages and it is not as complicated and confusing as the 30 Doradus giant HII region. We have obtained Spitzer Space Telescope observations and complementary ground-based 4m uBV_{IJK} observations of N44 to identify candidate massive young stellar objects (YSOs). We further classify the YSOs into Types I, II, and III, according to their spectral energy distributions (SEDs). In our sample of 60 YSO candidates, ~65% of them are resolved into multiple components or extended sources in high-resolution ground-based images. We have modeled the SEDs of 36 YSOs that appear single or dominant within a group. We find good fits for Types I and I/II YSOs, but Types II and II/III YSOs show deviations between their observed SEDs and models that do not include PAH emission. We have also found that some Type III YSOs have central holes in their disk components. YSO counterparts are found in four ultracompact HII regions and their stellar masses determined from SED model fits agree well with those estimated from the ionization requirements of the HII regions. The distribution of YSOs is compared with those of the underlying stellar population and interstellar gas conditions to illustrate a correlation between the current formation of O-type stars and previous formation of massive stars. Evidence of triggered star formation is also presented.

Reference: Accepted by ApJ

Status: Manuscript has been accepted

Weblink: <http://arXiv.org/abs/0901.1328>

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