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We present a multi-wavelength observational study of a low-mass star-forming region, L1251-C, with observational results at wavelengths from the near-infrared to the millimeter. Spitzer Space Telescope observations confirmed that IRAS 22343+7501 is a small group of protostellar objects. The extended emission to east-west direction with its intensity peak at the center of L1251A has been detected at 350 and 850 ❍m with the CSO and JCMT telescopes, tracing dense envelope materials around L1251A. The single-dish data from the KVN and TRAO telescopes show inconsistencies between the intensity peaks of several molecular line emission and that of the continuum emission, suggesting complex distributions of molecular abundances around L1251A. The SMA interferometer data, however, show intensity peaks of CO 2-1 and ^{13}CO 2-1 located at the position of IRS 1, which is both the brightest source in IRAC image and the weakest source in the 1.3 mm dust continuum map. IRS 1 is the strongest candidate for being the driving source of a newly detected the compact CO 2-1 outflow. Over the whole region (14′x14′) of L125l-C, 3 Class I and 16 Class II sources have been detected, including three YSOs in L1251A. A comparison with the average projected distance among 19 YSOs in L1251-C and that among 3 YSOs in L1251A suggests L1251-C is an example of low-mass cluster formation, where protostellar objects are forming in a small group.

[구 SF-04] Blue profile in different evolutionary stages of massive star forming regions

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Gravitational collapse is a dynamical process associated with star formation. One observational evidence of such infall motion is so called "blue asymmetry" profile, which is the optically thick line profile with the intensity peak skewed blueward relative to the intensity peak of optically thin lines. We analyzed both HCN J=1-0 and HNC J=1-0 line profiles to study the inflow motion in different evolutionary stages of massive star formation; Infrared dark clouds (IRDCs), High-mass protostellar object (HMPOs), and Ultra-compact HII regions (UCHIIs). The infall asymmetry in the HCN spectra seems to be more prevalent than the HNC spectra throughout all the three evolutionary phases. The prevalence of the blue profile in the HCN spectra is found in every evolutionary stage, with IRDCs showing the largest blue excess. In the case of the HNC spectra, only IRDCs show the blue excess statistically significant. These results suggest that HCN may be a better infall tracer in massive star forming region. In addition, even though the characteristics of the blue profile largely depend on the suitable combination of optical depth and critical density, our analyses also indicate that IRDCs may have the most active infall process compared to other evolutionary phases.

[구 SF-05] [Fe II] 1.64 μm Outflow Features around Ultracompact H II Regions in the First Galactic Quadrant

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We present [Fe II] 1.644 μm features around ultracompact H II regions (UCHIIs) found on a quest for the "footprint" outflow features of UCHIIs —the features produced by outflowing materials ejected during an earlier, active accretion phase of massive young stellar objects (MYSOs). We surveyed 237 UCHIIs in the first Galactic quadrant, employing the CORNISH UCHII catalog and UWIFE data, which is an imaging survey in [Fe II] 1.644 μ m performed with UKIRT-WFCAM under ~0.''8