EFFECTS OF STAR FORMATION ON BOUNDEDNESS IN LMC CLOUDS

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To investigate the effects of stellar feedback on the gravitational state of giant molecular clouds, we study ALMA maps of nine molecular clouds distributed throughout the Large Magellanic Cloud (LMC), the nearest star-forming galaxy to our own. Each cloud has been observed in both CO and ^{13}CO, enabling analysis based on assuming LTE conditions. We trace molecular hydrogen mass using the J=1-0 transitions for five of the clouds and J=2-1 for the other four. We perform noise and resolution matching on the sample, with a common resolution of 3.5 arcseconds (0.9 pc at the LMC distance of 50 kpc), and use the *SCIMES* clustering algorithm to identify discrete substructure, or "clumps." We supplement these data with tracers of recent star formation, such as resolution-matched Spitzer IRAC 8μm maps. The CO (^{13}CO) clumps identified cover a range of 4.4 (2.6) dex in luminosity-based mass and 2.3 dex in average 8μm surface brightness. The excess linewidth relative to the best-fit size-linewidth relation is well-correlated to the average 8μm flux in a clump, suggesting that the combined effects of radiative feedback and turbulence driven on large scales can explain the local energy injection observed at the clump scales. The magnitude of the excess linewidths we measure does not appear to result from opacity broadening. Further multi-line analysis may better constrain the assumptions made in these calculations.