

A ^{12}CO Survey of the LMC with NANTEN: Sensitive Observations

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Fully sampled $^{12}\text{CO}(J=1-0)$ observations of the whole extent of the LMC have been made, using the NANTEN radio telescope with a linear resolution of ~ 40 pc at a detection limit for $N(\text{H}_2)$ of $3 \times 10^{21} \text{ cm}^{-2}$. In addition, to reveal the distribution of weakly emitting molecular gas, several selected regions including 30 Doradus, the southern large CO complex, N11, N44, and the Bar, have been mapped with higher sensitivity corresponding to a detection limit of $1 \times 10^{21} \text{ cm}^{-2}$ in the same line at the same angular resolution. Based on these results, we estimate that the total molecular mass of the LMC may increase up to $\sim 7 \times 10^7 M_\odot$, about twice as large as our previous estimate, $\sim 4 \times 10^7 M_\odot$, if the sensitive observations were made over the whole galaxy. It corresponds to 5 – 10% of the HI mass $\sim 7 \times 10^8 M_\odot$ (McGee & Milton, 1966, *AuJPh*, 19, 343). We will discuss the cloud size distributions, size-linewidth relations, and the conversion factor from CO line intensity to H_2 column density in individual regions. From the detailed comparisons of the GMCs with HII regions and the young stellar clusters, star formation in each region also will be discussed.

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