Spectral Line Survey toward Quienscent GMC in the LMC

Y. Nishimura,[1] T. Shimonishi,[2] Y. Watanabe,[1] N. Sakai,[1] Y. Aikawa,[2] A. Kawamura,[3] and S. Yamamoto[1]

[1]*The University of Tokyo, Japan*
[2]*Kobe University, Japan*
[3]*National Astronomical Observatory of Japan*

Spectral line survey observations of three giant molecular clouds in the Large Magellanic Cloud (LMC) have been conducted in the 3 mm band with the Mopra 22 m telescope. Spectral lines of fundamental species such as CN, CS, SO, HCN, HCO^+, and HNC are detected in addition to CO and ^{13}CO. Although the observed sources show different star-formation activities, chemical compositions averaged over a molecular-cloud scale (10 pc) with our telescope beam are found to be similar to one another. The observed chemical compositions are almost free from star formation activities and their feedbacks. Nitrogen-containing species are confirmed to be deficient in comparison with the Galactic molecular clouds due to a lower elemental abundance of nitrogen in the LMC. In spite of general resemblance of chemical abundances among the three sources, it is found that the CS/HCO^+ and SO/HCO^+ ratios are slightly higher in a quiescent molecular cloud. An origin of this trend is discussed in relation to possible depletion of sulfur along molecular cloud formation.