

R02a ALMA observation of $^{12}\text{CO}/^{13}\text{CO}(J=3-2)$ molecular gas in merging ULIRGs

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Galaxy merger plays an important role in the evolutionary process of galaxies, as it changes the physical and chemical condition of the ISM dramatically, and intensifies the starburst/AGN activity as seen in the frequent occurrence of mergers in Ultra/Luminous Infrared Galaxies (U/LIRGs). Observations of multiple molecular gas will allow us to investigate the physical condition of the ISM and star formation properties triggered during mergers.

Here we present the results of $^{12}\text{CO}(J=3-2)$ and $^{13}\text{CO}(J=3-2)$ observations obtained toward six merging U/LIRGs with ALMA. We compare the distribution of $^{12}\text{CO}/^{13}\text{CO}(J=3-2)$ line intensity ratio at ~ 200 pc resolution. We found that (1) the averaged ratio values are higher (~ 20) than the typical values for normal spiral galaxies (~ 10), and (2) the ratio values at the central regions are typically lower than the outer regions. It can reflect the difference of opacity/abundance conditions of molecular gas, and can be a key to the variation of physical/chemical conditions as a function of merger stage and starburst/AGN activity.