[구GC-09] The ISM properties under ICM pressure in the cluster environment: NGC4330, NGC4402, NGC4522, NGC4569

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Galaxies undergo various processes in the cluster environment, which could affect their evolution. In particular, ram pressure due to intracluster medium (ICM) can effectively remove HI gas, which is a relatively diffuse form of interstellar medium (ISM). On the other hand, molecular gas is not expected to get easily stripped as atomic gas since it is denser and sitting well within the stellar disk in a deeper potential well. However, cluster galaxies are found to be redder and more passive in star formation activity compared to their field counterpart. This implies that molecular gas may also get affected somehow in dense environments. In this work, we investigate molecular gas properties of a sample of galaxies undergoing HI stripping due to the ICM. We present the 12/13 CO (2-1) data of four spiral galaxies in the Virgo cluster at different ram pressure stripping stages, obtained using the Sub Millimeter Array (SMA). CO morphology of the sample appears to be highly asymmetric and disturbed. Using the ratio of different lines, we probe the molecular gas temperature in different regions. We find higher gas temperature than the range normally found among field galaxies. We discuss how these distinct molecular gas properties may affect star formation and hence the evolution of the cluster galaxy population.

[구GC-10] Molecular gas content of HI Monsters

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We present 12CO (J = 1 → 0) observations of a set of local galaxies ($0.04 < z < 0.08$) with a large cool gas reservoir, dubbed “HI Monsters”. The data were obtained using the Redshift Search Receiver (RSR) on the Five College Radio Astronomy Observatory (FCRAO) 14 m telescope. The sample consists of 20 galaxies with $M_{HI}>3\times10^{10}M_{\odot}$ identified by the ALFALFA survey and 8 additional objects with comparable HI mass from a separate LSB galaxy study ($M_{HI}>1.5\times10^{10}M_{\odot}$). Our sample selection is purely based on the amount of neutral hydrogen in galaxies, thereby providing a chance to study how atomic and molecular gas relate to each other in these extremely HI-rich systems. We have detected CO in 15 out of 20 ALFALFA selected HI Monsters and 4 out of 8 LSB HI Monsters. We present the global molecular gas properties of the sample and discuss how their molecular gas properties correlate with their star formation activities.