[구GC-05] Diagnostics to Probe Environmental Effects on Late-type Galaxies in the Virgo Cluster

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We investigate 53 late-type galaxies in Virgo to get better understanding galaxy evolution driven by environmental effects in the cluster. The goal is to study how galaxies are strongly affected gravitationally by their surroundings and/or how interstellar medium (ISM) of galaxies changes through the interaction with intracluster medium (ICM). To quantify these, a variety of diagnostic methods have been introduced. Our diagnostics have two different perspectives. First, we have carefully examined the morphological and kinematical properties of individual galaxies using high resolution HI images and compared with multi-wavelength data. Based on the visual inspection, we have identified signatures of the interactions with other galaxies or the ICM. Second, we have quantified influence of local environments of individual galaxies using X-ray data and optical catalog of the cluster. By combining all the diagnostics, we have identified the environmental effect(s) at work on individual galaxies. We also probe the environmental processes as a function of the cluster centric distance. Various gravitational interactions are found throughout the cluster, while the ICM-ISM interaction is mainly dominant near the cluster center. However, we find some evidence that galaxies start losing their gas already in the low density outskirts of the cluster.

[구GC-06] H_2 Formation from HI by the Ram Pressure

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Ram pressure is known as one of the most efficient mechanisms to deplete the atomic gas of galaxies in the cluster environment. However, the influence of the ram pressure on the molecular gas is not yet clear. Since the molecular gas resides in the galactic center, thus in the deeper potential well, and has higher surface density than the atomic hydrogen, it has been known as that the molecular gas is not easily affected and/or stripped away by the ICM-ISM interaction. To investigate the influence of the ram pressure on the gas properties of galaxies, we compare HI and ^{12}CO(J=1-0) distribution of NGC 4654 which is experiencing on-going ram pressure and shows distinct HI, CO, optical, and Hα features due to the ram pressure. We discuss the possibilities of H_2 formation from HI by the ram pressure and also the star formation activities.