

Parent Galaxies of Extended Emission Line Regions in the Coma Cluster

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We constructed a special filter for Subaru/Suprime-Cam so that we can catch the H α emission at the redshift of the Coma cluster, and conducted a survey of the Coma cluster. We discovered extended ionized hydrogen clouds out of galaxies, and reported[1,2]. In this year, we listed such clouds up, and investigate the statistical features of their parent galaxies[3]. Most of the parents are found to be starforming or post-starburst galaxies. Their velocity relative to the cluster is typically greater than 1000 km/s. We also compared the samples with galaxies with an UV asymmetry[4], which is a signature of a gas-stripping event, and found that the UV asymmetric galaxies are ALL included in the parent galaxies of the H α clouds. These results suggest that the parent galaxies once lived out of the cluster and trapped by the gravity of the cluster. When they fell into the cluster, the gas was stripped by the interaction with the cluster hot gas and/or tidal force of the cluster. In this picture, we can imagine that if a parent galaxy is less massive with less gas they will soon lose all the gas to stop the starformation, while massive ones will hold gas to continue starformation. Such a correlation between the mass and the starformation is also confirmed. Previous studies show such extended ionized clouds in other clusters[5,6,7,8,9,10], but they are two in a cluster at most. In this study, we first reported many (14) parent galaxies in one cluster, and investigated the parents and their spatial and velocity distribution statistically.

References

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Figure 1: An example of the extended ionized clouds in the Coma cluster. B-band, R-band, and Coma H α clouds are shown as blue, green and red, respectively. The extended ionized clouds are seen as red. The bar at bottom right shows 10 kpc scale.