

Investigation of Interactions Between the Hot Plasmas and Galaxies in Clusters IV

T09a

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Nearby galaxy clusters are characterized by a relatively centrally-concentrated member galaxy distribution, which is typically much more compact than the intracluster medium (ICM) as well as the heavy element distributions in the ICM. In the 2011 autumn meeting (T11a), 2012 spring meeting (A06a), and 2012 autumn meeting (T04a), we have exerted a continuous effort to introduce our scenario and findings which explain the discrepant baryon distributions in the nearby universe. By studying a sample of 34 clusters, we detected clear evolution in galaxy light vs ICM mass ratio, so that the stellar component has become more concentrated than the ICM from $z = 0.9$ to 0.1. This suggests that the galaxies are dragged by the ICM, and gradually fell towards the cluster center. These results have been published in Gu et al., *ApJ*, 767, 157 (2013). In 2013 spring meeting (Q12a) we reported results obtained with X-ray + H α observations of an infalling galaxy in the Virgo cluster, where the metal-enriched galaxy gas is transported to the ICM via ram pressure stripping.

In this meeting we report results with a much larger cluster sample which consists of 260 galaxy clusters and groups. Based on Chandra/XMM data for the hot gas, and SDSS spectroscopic data for the member galaxies, we determined, with the best statistic ever achieved, the galaxy vs. hot gas distributions up to $z = 0.5$. Furthermore, the ICM metal mass to galaxy light ratios were also measured out to cluster outer regions. The new results confirms and much strengthen the evolution which we found before.