

T04a **Investigation of Interactions Between ICM and Cluster Galaxies III**

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In nearby clusters, the stellar component is more concentrated than the hot plasmas (ICM), whereas metals in the ICM are more extended than the stars which must have created them. Also it remains unclear how the ICM in the cool cores is heated against radiative cooling. In the 2011 autumn (T11a) and 2012 spring (A06a) meetings, we reported a novel finding that can solve both these puzzles. That is, we studied a sample of 34 clusters, and found clear evolution in the *galaxy light vs. ICM mass* ratio, so that the galaxies become more concentrated within the ICM sphere from $z = 0.9$ to 0.1. This suggests that the galaxies gradually fell towards the cluster center, by losing their dynamical energies through their interaction with the ICM.

Here, we report results of two follow-up studies. First, we also detected a similar evolution in the *galaxy light vs. total mass* ratio profiles among the 34 clusters, but the effect is smaller than the previously found evolution in the *galaxy light vs. ICM mass* profile. Therefore, the baryons and dark matter had similar spatial distributions in early ($z > 0.5$) universe, but the galaxies gradually fell towards the center while the ICM expanded (both relative to the dark matter). Secondly, we searched X-ray and optical data of several nearby relaxed clusters for any imprint of the suggested galaxy-ICM interaction. Then, we found that regions of excess galaxy surface density show systematically higher ICM temperature than adjacent regions of lower galaxy surface density. This suggests that the moving galaxies are indeed heating the ICM.