

## Investigation of Interactions Between the Hot Plasmas and Galaxies in Galaxy Clusters V

T04a

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After reionization the Universe can no longer be considered as neutral fluids, but must be treated as ionized media which are ubiquitously threaded by large-scale magnetic fields. It remains still unexplored how the magneto-plasma nature of matter affects the formation of cosmological structures, namely, galaxies, galaxy groups and clusters. In the past three years we have exerted a continuous effort to study the plasma phenomena in galaxy clusters using X-ray and optical observations; in 2011 autumn (T11a), 2012 spring (A06a), and 2013 autumn (T09a), we have reported our discoveries on the gradual galaxy infalling relative to the hot plasma over the cosmological timescale in galaxy clusters, and in 2012 autumn (T04a) and 2013 spring (Q12a), we presented evidences for galaxy motion-induced plasma heating and ram pressure strippings in individual clusters. All results support the same view that a significant amount of energy is flowing from galaxies into the cluster gas via plasma-galaxy interactions.

In this meeting we report our most recent results about the cosmological galaxy infall relative to the hot plasma. A volume-complete sample, including 340 galaxy clusters, has been studied in both X-ray and optical bands. Using the archival Chandra/XMM data and SDSS photometry, we determined, with the best statistics ever achieved, the galaxy vs. hot plasma distributions up to  $z = 0.5$ . The new results confirms and much strengthen the galaxy infall scenario which we reported before.