

General Relativity and Quantum Cosmology

The imprint of the interaction between dark sectors in galaxy clusters

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Based on perturbation theory, we study the dynamics of how dark matter and dark energy in the collapsing system approach dynamical equilibrium while interacting. We find that the interaction between dark sectors cannot ensure the dark energy to fully cluster along with dark, leading to the energy non-conservation problem in the collapsing system. We examine the cluster number counts dependence on the interaction between dark sectors. Furthermore, we analyze how dark energy inhomogeneities affect cluster abundances. It is shown that cluster number counts can provide specific signature of dark sectors interaction and dark energy inhomogeneities.

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