



Cosmology with Clusters of Galaxies ^{*}

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Abstract. I reviewed in my talk recent results on the cosmological constraints that can be obtained by following the evolution of the population of galaxy clusters. Using extended samples of X-ray selected clusters, I have shown how they can be used to trace this evolution out to redshift $z \sim 1$. This evolution can be compared to model predictions and, therefore, to constrain cosmological parameters, such as the density parameter Ω_m and the shape and amplitude of the power spectrum of density perturbations. I have emphasized that the robustness of such constraints is quite sensitive to the relation between cluster collapsed mass and X-ray luminosity and temperature. This demonstrates that our ability to place significant constraints on cosmology using clusters of galaxies relies on our capability to understand the physical processes, which determine the properties of the intra-cluster medium (ICM). In this context, I have discussed how numerical simulations of cluster formation in cosmological context can play an important role in understanding the ICM physics. I have presented results from a very large cosmological simulation, which also includes the hydrodynamical description of the cosmic baryons, the processes of star formation and feedback from the stellar populations. The results from this simulation represent a unique baseline to describe the processes of formation and evolution of clusters of galaxies.

Key words. Cosmology – Clusters of Galaxies – Numerical methods

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