

The properties and evolution of poor groups of galaxies

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We used a sample of 40 poor groups of galaxies from the Mulchaey et al. (2003) X-ray catalogue, from the RASSCALs (Mahdavi et al. 2000) and SDSS database to study intensively the physics, dynamics and the evolution of poor groups of galaxies. This sample consists of groups from spiral rich to early type dominated systems and systems with and without substructure. We find that early type dominated X-ray bright groups have more dominating galaxies and dwarf galaxies as well as higher velocity dispersions on average than spiral rich X-ray undetected groups. We also find by analyzing former ROSAT detections in the X-rays with new observations from XMM Newton for some very nearby groups, that the emission is early-type galaxy related and not from the intergalactic medium anymore. Using the fainter group members we investigated on the relationship of the velocity dispersion from N_{grp} , absolute magnitude, radial distances and substructure. We found that these variables depend on the type of the group (e.g. the behavior of spiral rich groups differ systematically from those who are dominated by ellipticals). At least for the more massive, early-type dominated groups we define the number of group members required to calculate a robust velocity dispersion. Finally we used the gained knowledge of this study on the entire Mulchaey-catalogue to make constraints on the X-ray scaling laws for a better understanding of the relationship between the kinematics of the hot gas and galaxies in these common environments.

*BDMH 2004 – Baryons in Dark Matter Halos
5–9 October 2004
Novigrad (Croatia)*