PROPERTIES OF E & S0 GALAXIES IN THE COMA CLUSTER

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As one of the richest nearby clusters, Coma is the ideal place to study the structure of galaxies as a function of environmental density, thus to constrain the theories of galaxy formation and evolution. For a magnitude limited sample of $\approx$ 40 E and S0 galaxies we want to obtain spectra with sufficient S/N and spatial resolution, that we can derive the rotation curves, the velocity dispersions profiles and the radial gradients of the line indices of Mg, Fe and Hβ. Following questions will be addressed:

- Are the radial velocity dispersion profiles and the rotation of galaxies in high density environments similar to those in low density environments? Data for galaxies in low density environment are available from Bender et al. (1994, *MNRAS*, **269**, 785). Are the centrally measured velocity dispersions representative for the mean kinetic energy of the galaxy?
- Can the scatter in the Fundamental Plane (FP) - which tightly correlates the radii, surface brightnesses and (central) velocity dispersions (Djorgovski & Davis, 1987, *ApJ*, **313**, 59; Dressler et al. 1987, *ApJ*, **313**, 42) - for the Coma cluster be reduced if the mean kinetic energy is used instead of the central velocity dispersion? Can we derive stronger constraint on the variations in the M/L ratio than already implied by the FP?
- The radial gradients of the line indices can be used to test the hypothesis that the metallicity gradient depends on the so-called "escape velocity" of the stars introduced by Franx & Illingworth (1990, *ApJ*, **359**, L41) . Also we can check whether the age of the stellar population varies with radius. Ages and metallicities can be estimated from the data with the use of stellar population models (Worthey 1994, *ApJS*, **95**, 105; Bruzual & Charlot 1993, *ApJ*, **405**, 538).
- How does the radial variation of stellar populations and kinematics within the galaxies vary as a function of the clusters density profile?

We already obtained spectra for 19 galaxies with total magnitudes $B_T = 11.^m - 13.7^m$ at the MDM 2.4m telescope, the McDonald 2.7m telescope and the 3.5m telescope at Calar Alto. First rotation curves and velocity dispersion profiles show the typical shapes for the different types of galaxiesx (E, S0, E/S0).

https://doi.org/10.1017/S007418090023338X Published online by Cambridge University Press