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THE MASS PROFILE OF NGC 1399 DETERMINED FROM GLOBULAR CLUSTER DYNAMICS

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Spectra of hundreds of globular clusters around NGC 1399 have been acquired at the VLT with FOR S2 / MXU. 470 cluster radial velocities have been obtained, representing the largest velocity sample for any galaxy collected so far. This sample is large enough to allow a fully self-consistent dynamical modeling. We present our sample and give preliminary results.

Globular clusters have a high potential to study the mass profile of early-type galaxies out to large radii using them as dynamical tracers. NGC 1399, the central galaxy of the Fornax cluster, is a particularly promising target for such an investigation due to its rich cluster system ($\approx$ 6000, e.g. Ostrov et al. 1998). We obtained 470 cluster radial velocities with a mean uncertainty of $55\,\mathrm{km\ s^{-1}}$. The uncertainity has been derived by comparing independent velocity measurements for a subset of clusters on different masks. They cover the radial range from $2'$ to $8'$ corresponding to 11 kpc to 44 kpc. The velocities have been obtained with cross-correlation techniques as well as with direct line measurements. Additionally, photometry in the Washington system has been acquired that allows straightforward identification of a red, metal-rich and a blue, metal-poor cluster population due to the strong bimodality of the color distribution.

A full dynamical analysis of the data is underway and will be published soon.

We observed a radially constant velocity dispersion ($304 \pm 11\,\mathrm{km\ s^{-1}}$ for the whole sample) which is in contrast to former studies that used much smaller velocity samples (Kissler-Patig et al. 1999). Moreover, we found that the metal-rich and the metal-poor subpopulations have a significantly different *projected* velocity dispersions of $297 \pm 16\,\mathrm{km\ s^{-1}}$ and $355 \pm 22\,\mathrm{km\ s^{-1}}$, respectively.

In our analysis we assumed a spherically symmetric three dimensional density distribution of globular clusters. With a power law of the form $\rho \propto r^{\alpha}$ we find for red and blue subpopulations $\alpha = -2.5 \pm 0.1$ and $\alpha = -1.7 \pm 0.1$, respectively (assuming spherical symmetry). Under the additional assumption of no-rotation the difference in the measured velocity dispersions is in accordance with the density profile difference assuming isotropy (this can be seen from the spherical Jeans equation, e.g. Binney & Tremaine 1997). The radially constant velocity dispersion implies an r^{-2} mass distribution, representing an isothermal sphere. This corresponds to a constant circular velocity of $460 \pm 25\,\mathrm{km\ s^{-1}}$. For such a mass distribution the mass-to-light ratio measured in the B band rises from $20\,\mathrm{M_\odot/L_\odot}$ at 11 kpc to $40\,\mathrm{M_\odot/L_\odot}$ at 44 kpc. The total mass within 40 kpc is in good agreement with the mass determinations based on ROSAT data (Jones et al. 1997)

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