Dwarf Galaxies: From the Deep Universe to the Present
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Faint Dwarf galaxies in nearby WINGS clusters: photometric characterization

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Abstract.
In the cores of galaxy clusters there is a population of lows-mass stellar systems such as dwarf Early-type galaxies, ultra-compact dwarf galaxies (UCDs) and ultra diffuse dwarf galaxies. We present here the photometric and morphological characterization of this population of objects using deep CFHT images of a sample of clusters belonging to the WINGS survey ($0.04 < z < 0.06$). We study only galaxies that are spectroscopically confirmed members of the cluster. The population of dwarfs ranges from ∼30% for the more rich clusters to ∼5-6% for the less rich ones.

Keywords. galaxies: clusters: general, galaxies: dwarf, galaxies: evolution, galaxies: formation

1. Introduction

The most numerous type of galaxies in clusters are dwarfs, these objects have an absolute magnitude $M_B > -18$ but greatly vary in size, morphology, regularity and/or colors (Lisker et al. 2008). Dwarf irregulars (dIrr), dwarf ellipticals (dE) and blue compact dwarf galaxies (BCD) are the most common known dwarf types (Kourkchi et al. 2012). Their low mass ($< 10^9 M_\odot$) suggest that they are the objects most influenced by their environment compared to the most massive galaxies. However, the most detailed studies have been done for very nearby clusters like Virgo, Coma and Fornax. Here we present a study of dwarfs in 7 ($0.04< z < 0.06$) clusters belonging to the WINGS survey (Fasano et al. 2006). We use deep g and r images taken from the archive of CFHT+Megacam reduced data. All the galaxies are spectroscopically confirmed members of the cluster, have an isophotal area>300 pixels and a $M_g > -17$ in Fig. 1,upper right panel, we show the distribution of the absolute magnitude M_g with highlighted the different clusters. With these constraints our final sample is composed by 235 galaxies. In Fig. 1, upper left panel, some of the galaxies in our sample are shown.

2. Results

Using IRAF task ELLIPSE we obtain the luminosity profiles and we derive the main photometric parameters for the galaxies. Our study confirm previous findings (Binggeli & Cameron 1991 ,Kourkchi et al. 2012) that the radial intensity profiles of dwarfs have low Sersic indices "n", similar to late-type galaxies. in Fig. 1 (lower left panel) we show the histogram of our Sersic index, the mean value is n=2.5 and of R_e (upper right panel). Dwarfs are found in the whole cluster field, no preferred locations are visible.

The large fraction of dwarfs is found in A85 that is the cluster with the large spectroscopic database available. In average The population of dwarfs ranges from ∼30% for the

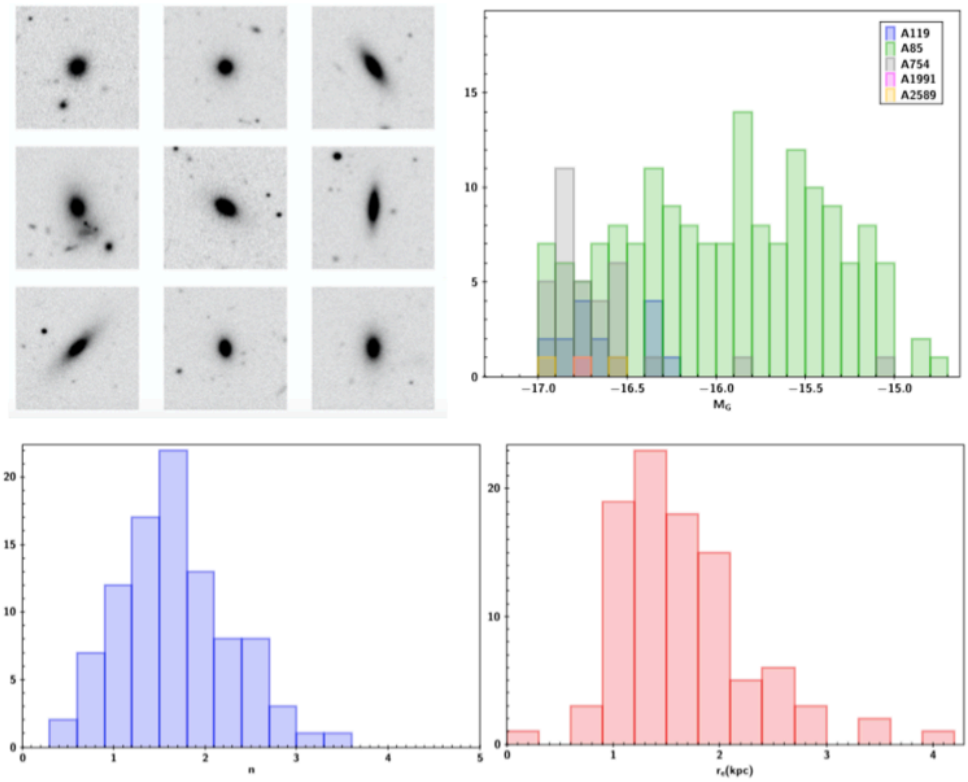

Figure 1. Upper Left panel: A selection of dwarfs FOV 1.6'x1.6' North at top Est at left. Upper Right panel: The distribution of the absolute magnitude M_g for our sample. Lower Left Panel: Distribution of Sersic index. Lower rigth panel: distribution of R_e.

more rich clusters to ∼5-6% for the less rich ones. In Virgo Cluster the Color-magnitude diagram Lisker et al. (2008) indicate a possible difference among dwarfs. In our sample we found a red g-r∼0.7 and a blue g-r∼0.3 population of dwarfs indicating that this difference seems stronger.

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