

LOW LUMINOSITY GALAXY DISTRIBUTION IN LOW DENSITY REGIONS

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1. Introduction

We performed two surveys at the Calar Alto Observatory to identify low luminosity galaxies (LLG) in 4 fields towards nearby voids. While the central parts of the voids remain empty, we found about 20 very isolated (nearest neighbour distances of $D_{NN} \geq 4\text{Mpc}$) galaxies along the rims of some (but not all) voids (Hopp *et al.* 1995, Hopp & Kuhn 1995, Kuhn *et al.* 1996, Popescu *et al.* 1996). Many of them are dwarfs, a few are giants. CCD surface photometry revealed normal properties (Vennik *et al.* 1996), HI-observations show a tendency that the isolated dwarfs are overabundant in neutral gas compared to sheet and cluster galaxies of the same luminosity (Huchtmeier *et al.* 1996).

2. Analysis

Our sample of isolated dwarfs is still too small for most statistical applications. Thus I tried to combine our surveys with the results of similar studies of LLG's (Pustil'nik *et al.* 1995; Rosenberg *et al.* 1996; Salzer 1989) which also detected highly isolated galaxies. Naturally, the combined sample is incomplete and inhomogeneous, but it can serve as a test case for very wide angle survey (see Lipovetzki *et al.*, this volume, p. 299) Our comparison sample for giants is the CfA2 catalogue (Huchra *et al.* 1990, from ZCAT, $B = 15.7^m$). All samples are restricted to $v_r \leq 10^4 \text{ km s}^{-1}$. All LLG samples follow the same luminosity function with a steep slope at the faint end ($\alpha \sim -1.6$). Especially, the ~ 100 isolated ($D_{NN} \geq 3\text{Mpc}$) galaxies in the combined sample show the same function as sheet members. Most of the dwarfs ($M_B \geq -18^m$) follow the well-known features outlined by the giants.

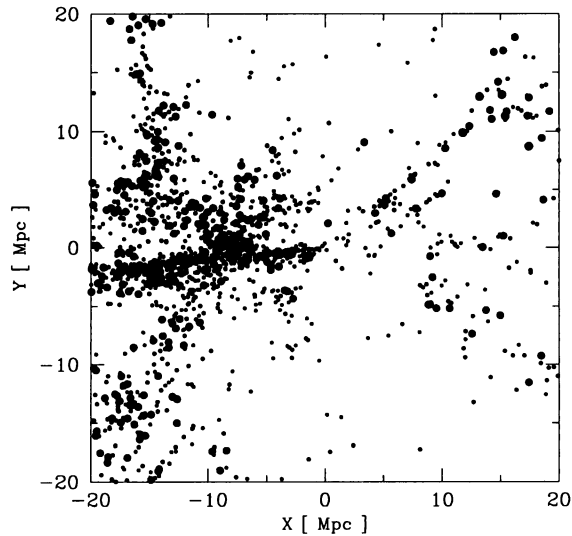


Figure 1. Spatial distribution in cartesian coordinates, Z projected (± 20 Mpc). Symbol coding according to M_B . Most of the (absolutely) faint galaxies (small dots, $-18^m \leq M_B \leq -12^m$) follow the distribution outlined by the bright ones (big dots, $-23^m \leq M_B \leq -18^m$), but some additional structures are only occupied by these faint galaxies.

Some of the dwarfs populate structures which are avoided by bright galaxies (Figure 1) while $\text{Ly}\alpha$ clouds may even populate sheets which are avoided by dwarfs (see Shull *et al.* 1996). These additional spatial structures may point to hierarchical clustering.

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