

# Retarded Evolution of Low-Mass Galaxies in Voids?

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**Abstract.** We analyze possible differences in the global environments of very metal-poor BCGs with that of typical metallicity BCGs, basing on the parameter  $D_{NN}$  – distance to the nearest “luminous” galaxy. We find very significant difference suggesting that a higher fraction of unevolved dwarfs reside in ‘voids’.

**Keywords.** galaxy evolution, galaxy abundances, galaxy environment, galaxy interactions

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## 1. Introduction

Popular CDM models of the structure and galaxy formation predict that a fraction of low-mass galaxies in the regions of very low density of normal galaxies (“voids”) form later and evolve more slowly. Up to now the data were too scarce to check this statement. We address this issue with our new abundance data for a large sample of blue compact galaxies (BCGs).

## 2. Method and Results

We base our analysis on the largest sample of 506 BCGs from the zone of the Hamburg/SAO Survey for ELGs, performing the direct comparison of distributions of  $D_{NN}$  – distance to the nearest “luminous” ( $L_B > L_*$ ) galaxy (from the UZC sample) for the well selected samples (in the same studied volume with  $cz < 7500 \text{ km s}^{-1}$ ) of “typical” BCGs ( $12 + \log(O/H) > 7.75$ ) and a small subsample of very metal-poor BCGs ( $12 + \log(O/H) \leq 7.75$ ). For the constructed BCG subsamples, in which various selection effects and potential interferences are reduced, we find significant difference (confidence level of 0.999) in the respective  $D_{NN}$  distributions. There is an excess of brighter ( $M_B < -15.5$ ) metal-poor BCGs for  $D_{NN} > 4 \text{ Mpc}$  (9 of 10 very metal-poor BCGs are in ‘void-like’ regions). Besides, we find that at least ten more very metal-poor BCGs fall inside other voids or near their rims.

## 3. Conclusions

1. This finding is in a qualitative agreement with CDM model predictions. 2. It provides new evidences for the important role of interactions in the BCG evolution. 3. It gives a first quantitative estimate of a fraction of underevolved galaxies in voids. 4. This also opens a more efficient way to search for unevolved galaxies in the local Universe.

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