The Alignment of Red-Sequence Dwarf Galaxies

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Introduction

We present a preliminary analysis of the galaxy alignment effect for a sample of dwarf galaxies ($-19 < M_R < -17.5$) extracted from 41 low-redshift ($0.02 < z < 0.15$) Abell clusters. Understanding the relationship between cluster galaxies and their local environment will help to uncover details about galaxy formation and evolution in these dense regions.

Selection Criteria

Galaxy ellipticity and position angle measurements are made using GALFIT. Individual cluster dwarf galaxies are selected using the following criteria:

• B−R color within 3σ of the red-sequence and ellipticity (b/a) < 0.9

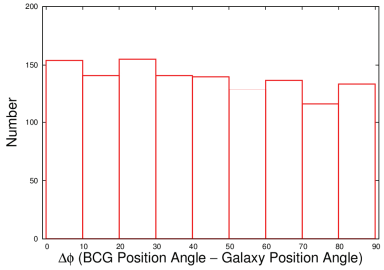

Figure 1: The distribution of the difference in position angles (acute angles) as measured from BCG major axes to dwarf galaxy principle axes.

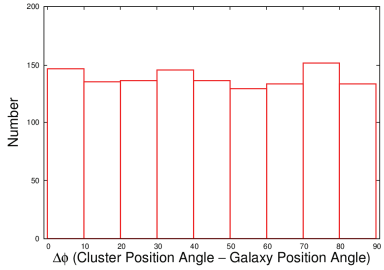

Figure 2: The position angle differences between cluster major axes and the axis of the dwarf galaxies.

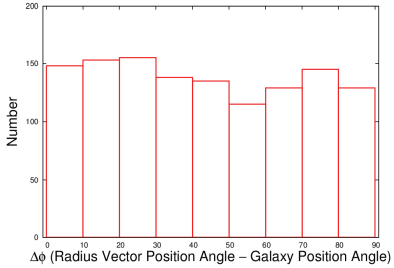

Figure 3: The position angle difference between the major axes of the dwarf galaxies and radius vectors from the cluster center (BCG) to individual galaxies.

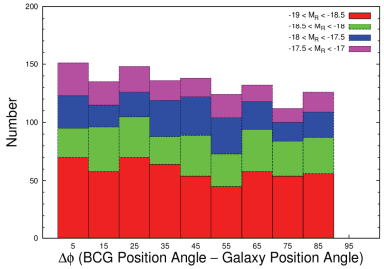

Figure 4: Similar to Figure 1 except that the dwarf galaxies have been divided into separate magnitude bins.

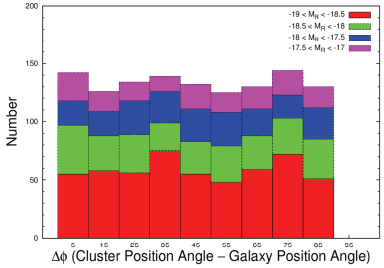

Figure 5: Similar to Figure 2 except that the dwarf galaxies have been divided into separate magnitude bins.

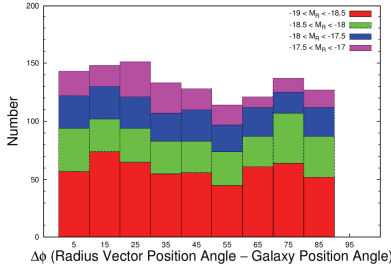

Figure 6: Same as Figure 3 except that the dwarf galaxies have been divided into separate magnitude bins.

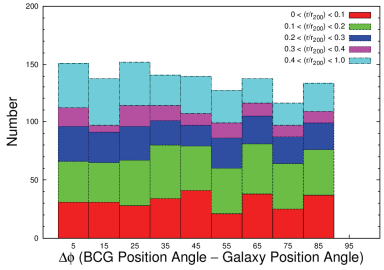

Figure 7: Position angle differences between BCG and the dwarf galaxies for various clustercentric annuli.

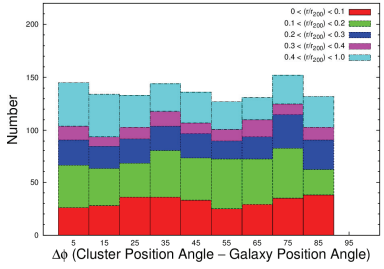

Figure 8: Position angle differences between cluster major axes and dwarf galaxies for several radial bins.

Results: Dwarf galaxies show no correlation with BCG, cluster, or radius vector, with respect to absolute magnitude and clustercentric radius. This is consistent with the random orientation of cluster dwarf galaxies with $-19 < M_R < -17.5$.

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