

THE STELLAR POPULATIONS AND DYNAMICS OF ELLIPTICAL GALAXIES IN COMPACT GROUPS

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Abstract. We present a study of the photometric and spectroscopic properties of elliptical galaxies in compact groups. We find that although some elliptical galaxies are affected by interactions and mergers, the current merger rate is small, even in compact groups of galaxies. We also find tentative evidence that the central velocity dispersions of elliptical galaxies in compact groups are lower than the velocity dispersions of similar galaxies in other environments.

1. Stellar Content of Elliptical Galaxies in Compact Groups

The compact groups of galaxies classified by Hickson (1982) provide a favorable environment for merging because they have high spatial densities and velocity dispersions comparable to galactic internal velocities. In our multicolor survey of 55 elliptical galaxies in these groups we find that four of them are unusually blue, indicative of recent interactions or mergers (Zepf et al. 1991). Although the discovery of blue ellipticals in compact groups is evidence that interactions and mergers are occurring, the relatively small number discovered indicates that the time scale for compact groups to evolve by mergers into a single elliptical galaxy is much longer than the observed crossing time. A slow evolution is also indicated by the small fraction of elliptical galaxies outside of compact groups which are unusually blue (Zepf and Whitmore 1991).

2. Dynamics of Elliptical Galaxies in Compact Groups

The elliptical galaxies in compact groups also offer an excellent opportunity to test the robustness of the “fundamental plane” to changes in environment. We have found tentative evidence that the elliptical galaxies in compact groups have a different zero point in the fundamental plane relations than elliptical galaxies in other environments. This offset is due to the velocity dispersions, which are lower in compact group ellipticals relative to similar ellipticals in other regions.

References

- Hickson, P. 1982, *Ap. J.*, **255**, 382.
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