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GALAXY EVOLUTION IN A NEW SOUTHERN COMPACT GROUPS SAMPLE

E. Pompei[1] and A. Iovino[2]

Compact groups are association of 4-8 galaxies with high spatial densities ($\delta\rho \sim$ 10-20), but low velocity dispersion. According to current dynamical models, galaxies belonging to such systems should interact violently and merge on a relatively short time scale (see eg. Carnevali et al. 1980). Therefore compact groups are an ideal laboratory to study interaction and merging between galaxies. We present here the results from spectroscopic and photometric observations of a new sample of compact groups in the Southern Sky, selected by an automatic detection algorithm applied to a digitized galaxy database.

The new sample of compact groups (SCG, Iovino, 2000) is selected in automated fashion from a digitized galaxy catalogue, obtained from scanning blue plates. It covers an area of $\sim$ 5200 *sq deg* around the South Galactic Pole. This sample comprises 121 new groups and it is well suited for statistical studies of compact groups properties as it is unaffected by the biases introduced by visual selection methods (Prandoni, Iovino & MacGillivray, 1994). Spectroscopic and photometric observations have been carried out for a brighter subsample of 60 compact groups ($b_j \leq 14.5$ for the brightest member galaxy). We summarize here the results obtained so far:

- Spectroscopically confirmed physical membership for 49 groups;
- Morphological and luminosity concordance between group members;
- Southern Compact Groups are regions of high spatial density ($\delta\rho \sim$ 10-20), while their surroundings have density comparable to the background field galaxy distribution;
- Evidence for three or more interacting galaxies (tidal plumes, distorted morphology, double nucleus, physical companion) have been observed in 24 groups;
- Group ellipticities measured using the method defined by Rood (1979) are consitent with a non random orientation on the sky. The mean apparent axial ratio is $e = b/a = 0.57 \pm 0.23$, and it does not change if the selection is limited to the spectroscopically confirmed compact groups.
- The fraction of late type spiral galaxies is $f_s = 0.69$ against $f_s = 0.49$ obtained for Hickson Compact Groups (Hickson, 1982) and $f_s = 0.82$ (Nilson, 1973) for field galaxy sample.

Our findings so far demonstrate that the bright subsample of Southern Compact Groups is mostly composed of bound structures, with a higher frequency of spirals than that found for the Hickson sample, and are highly flattened systems. The higher fraction of spiral galaxies is likely due to the different filter bandpass used with respect to Hickson (b_j against R), which is likely to favour bluer galaxies. The non sphericity of the groups can be explained either by the fact that the system collapse in presence of anisotropic velocity distribution or there are tidal interaction with a nearby massive object, like a rich cluster of galaxies (Oleak et al., 1995). Considering that we measure the same apparent mean axial ratio for the photometrically selected groups and for the spectroscopically confirmed ones, and that member galaxies in compact groups are moving toward the group's longest axis (Tovmassian, 2000), i.e. the velocity distribution of the group is not isotropic, we can conclude that SCGs are mostly gravitationally bound structures with a longer lifetime than that predicted by current numerical simulations.

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[1]European Southern Observatory Alonso de Cordova 3107 - Vitacura Santiago de Chile, Chile (epompei@eso.org)
[2]Osservatorio astronomico di Brera Via Brera 28 - 20121 Milano Italy (iovino@brera.mi.astro.it)

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