

Nuclear Activity in UZC Compact Groups

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Abstract. We have analyzed the level and type of nuclear activity in 720 galaxies belonging to a large complete sample of Compact Groups (UZC-CGs). We have found that most (67%) galaxies show emission lines and that the most frequent (43%) nuclear activity is AGN. AGNs are mainly hosted in bright early type galaxies and early spirals, at variance with HII which reside in late spirals of lower luminosity. CGs which have a dominant content of AGNs and TOs have larger σ_v and lower R_p than CGs dominated by HII.

1. Introduction

The AGN-environment relation is a largely debated subject which may be properly addressed investigating the level and kind of nuclear activity in 'extreme structures' such as compact groups. The UZC-CG sample (Focardi & Kelm, 2002) appears particularly suited for this aim, as it is large, complete and has been produced with objective selection criteria. Inspection of three spectroscopic database archives (SDSS-DR4, Z-Machine and FAST Spectrographs) allowed us to build a sample of 215 groups with spectra available for the all (720) galaxy members. It is well representative of the UZC-CG catalogue.

2. Analysis and results

The majority (67%) of galaxies show emission features indicating the presence of some kind of nuclear activity (HII, LINER or Seyfert 2). We have performed nuclear classification using $\log([\text{OIII}]/\text{H}\beta)$ versus $\log([\text{NII}]/\text{H}\alpha)$ diagnostic diagram, $[\text{NII}]/\text{H}\alpha$ ratio, the $[\text{SII}]$ lines (6717Å and 6731Å when available) and the sequences obtained by Kauffmann *et al.* (2003, Ka03) and by Kewley *et al.* (2001, Ke01). Of the 480 emission line galaxies, 43% are above [Ke01] revealing the AGN content, 37% are below [Ka03], that is HII-nuclei, and remaining 20% (between [Ka03] and [Ke01]) are transition objects (TOs). The analysis of morphological and photometrical data (B Luminosity) showed that AGNs are located mainly in bright early types and early spiral meanwhile HII are hosted in fainter and later types. TOs, which are a 'mixture' of AGNs and HII, reside mainly in late spirals of higher luminosity. TOs and AGNs are the dominant population for early-spiral. Concerning environment, we have compared the distribution of the velocity dispersion (σ_v), radial velocity and pairwise separation (R_p) for CGs dominated (> 50%) by AGNs, HII, TO and Non emission (NoE). Both AGN and TO dominated CGs show similar features, they have large median σ_v (178 km/s) and small median sizes (59 kpc). HII dominated CGs show significant lower median σ_v (100 km/s) and larger median sizes (74 kpc).

References

- Focardi, P. & Kelm, B. 2002, *A&A* 391, 35.
Kauffmann, G., Heckman, T.M., Tremonti, C. *et al.* 2003, *MNRAS* 346, 1055.
Kewley, L.J., M.A., Dopita, Sutherland, R.S., Heisler, C.A. & Trevana, J. 2001, *ApJ* 556, 121.