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SPECTRAL CLASSIFICATION AND ANALYSIS OF NUCLEAR ACTIVITY IN THE UZC-COMPACT GROUP SAMPLE

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Compact Groups are ideal systems to study galaxy-galaxy interactions and eventually the activity-environment-morphology relationship.

Here we present an analysis of the presence of nuclear activity and its relation with the properties of the host galaxy and the parent group. With this aim we searched for spectroscopic data for the whole UZC-CGs catalogue (Focardi & Kelm 2002) in three Archives: the SDSS-DR4, the Z-Machine and the FAST Archive. From them we selected a complete sample of 215 compact groups with available spectra for all their 720 member galaxies.

Looking at the complete sample we found that 67% show emission lines in their nuclei.

We measured equivalent widths and fluxes of the 486 emission lines galaxies for the nuclear classification. It was performed using the usual diagnostic diagrams. In Figure 1 we plotted in the BPT diagram (Baldwin et al. 1981) all the objects with at least the four emission lines and the sequences obtained by Kauffmann et al. (2003, hereafter Ka03) and by Kewley et al. (2001, hereafter Ke01). We classified the galaxies as: (1) H II nuclei (stars): galaxies below the Ka03 curve. (2) AGN (squares): galaxies above Ke01 sequence. (3) Transition Objects (TOs, circles): galaxies, containing an AGN diluted by circumnuclear emission, located between both sequences.

Galaxies not included there but having [N II] and Hα lines have been classified as: H II if $\log(\mathrm{N\,II}/\mathrm{H}\alpha) < -0.4$; AGN if $\log(\mathrm{N\,II}/\mathrm{H}\alpha) > -0.1$ and TOs between the two limits. Galaxies with only the [N II] line are classified as AGN (Coziol et al. 2000).

After the nuclear classification we found that 37% of the emission galaxies host an H II nuclear region, 43% a pure AGN and 20% a TO.

We also analyzed the distribution functions of the morphology, and absolute magnitude of the host galaxy for each nuclear type and we may conclude: (a) Non emission nuclei are in earlier type galaxies to that of the AGN but in fainter ones. (b) AGN are in bright early types and early spirals, whereas H II are hosted in fainter and later types. (c) TO are mainly in later spirals but with higher luminosity than H II (Table 1).

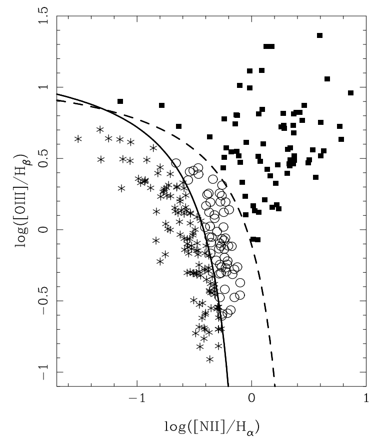

Fig. 1. BPT diagram and sequences used for nuclear classification: Ka03 (solid line) and Ke01 (dashed line).

TABLE 1 MEAN GALAXY PROPERTIES

	NonE.	AGN	TO	H II
Morph.	−1.1(S0)	1.1(Sa)	3.1(Sb)	3.8(Sbc)
M_{B}	−20.3	−20.6	−20.2	−19.8

Following a similar analysis for the relation between the group dominant activity type and the properties of the group we obtained: (a) The distribution of velocity dispersion and mean pairwise separation are similar in both AGN and TO dominated groups. (b) AGN dominated groups have larger velocity dispersions (180 km s^{-1}) and smaller sizes (58 kpc) whereas H II dominated groups show lower velocity dispersions (100 km s^{-1}) and larger sizes (R_p = 74 kpc).

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