LOW-LUMINOSITY RADIO QSOS: THE B2 SAMPLE

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Abstract. We present preliminary results from imaging and spectroscopy of a complete sample of radio quasars selected from the B2 survey. The optical data, which provide us information on the environment around the quasars, as well as the redshifts, allow us to address several questions related to the origin and evolution of the radio quasars population. Using VLA observations of the sources we investigate the radio morphology and distortions of these low-luminosity radio quasars. We compare these properties with those of powerful radio quasars.

1. Introduction and the sample

Barthel & Miley (1988) found that powerful (3C) radio quasars at high redshift seem to be more distorted than quasars at low redshift, suggesting an epoch-dependence of radio structure and of the properties of the intergalactic medium around QSOs.

We have started an study of a sample of radio quasars which are a factor of 20 less powerful than 3C quasars in order to compare the properties of high and low-luminosity quasars. The sample is the complete sample of B2 quasars which consists of 72 objects identified with blue point-like sources on the POSS plates. The objects are brighter than 21st magnitude and 0.25 Jy at 408 MHz. All have been observed with the WSRT at 6 and 21 cm

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and with the VLA at 6cm (Rogora et al. 1986, 1987). The sample contains 47 extended sources ($> 10''$) and 25 compact sources ($< 10''$).

2. Observations and results

We have observed the QSOs at the Observatorio del Roque de los Muchachos at La Palma (Canary Islands). We have made CCD imaging at the 2.5m Nordic Optical Telescope (NOT) in the r band in good seeing conditions and reaching a limiting magnitude of ~ 23. Low-dispersion spectroscopy (~ 10Å effective resolution) was carried out at the 4.2m William Herschel Telescope (WHT) using the Faint Object Spectrograph (FOS) in order to complete the redshift information of the sample.

From the VLA maps we have measured the largest angular size (LAS) and the distortion angle (ϕ). This is the angle subtended by the directions hot spot to radio core and radio core to the other hot spot. We have made a similar analysis as was done by Barthel et al. (1988) and Barthel & Miley (1988) with the following results:

- Small sources are more distorted. This was found before by Padrielli et al. (1988) but they had a more limited information on redshifts.
- At high redshift ($z > 2$) only 1 out of 6 sources has $\phi > 20°$, while Barthel & Miley found the relation $\phi \sim (1+z)^{1.7}$. They concluded that the ambient medium, interacting with the radio jets, is producing the distortions at high redshifts. The difference found by us between low and high luminosity QSOs could be due therefore to a less dense intracluster medium around low-luminosity radio loud QSOs.

References

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