TOWARDS A COMPLETE SAMPLE OF GIANT RADIO GALAXIES AT Z > 0.4

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1. Introduction and source selection

Giant Radio Galaxies are the largest radio sources associated with galaxies. They have linear sizes exceeding 1 Mpc (e.g. Saripalli *et al.*, 1986). They used to be known only at redshifts below 0.2, and it has been argued that this was not only due to a selection effect, but that there is a real cutoff in the space distribution of these objects (e.g. Gopal-Krishna & Wiita, 1987). Recently, a small number of giants have been found at redshifts largely exceeding 0.3, indicating that such a cutoff does not exist (e.g. Cotter *et al.*, 1995).

Studying GRGs is important for a number of reasons, including:

- GRGs are the only sources that probe the Inter Galactic Medium (IGM) on Mpc scales: the physical conditions in the diffuse part of the radio lobes (the so-called bridges) strongly reflect the physical state of the ambient medium (e.g. Subrahmanyan & Saripalli, 1993). If GRGs are so large because they reside in low-density environments, they could be populating voids in the large-scale galaxy distribution. If this were indeed the case, they provide us with unique and otherwise not obtainable information on the physical state of the IGM there.
- The extreme sizes raise questions such as: How do these sources evolve? How do their progenitors look like? What can we learn about their host galaxies? How do high redshift GRGs compare to their low redshift kin?
- Do these sources obey the orientation dependent unification scheme (e.g. Barthel, 1989)? If they do, then a sample selected on basis of a

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large linear size should contain only a few radio quasars.

With the advent of sensitive surveys such as the WENSS (De Bruyn *et al.*, *these proceedings*) and the FIRST (Becker *et al.*, 1995; Becker, *these proceedings*), we can, for the first time, select large samples of candidate GRGs.

From the WENSS we selected all sources with a flux density between 80 and 300 mJy at 325 MHz, and with an angular size exceeding 1 arcminute. Subsequently, we used the FIRST survey to select only sources with an FRII morphology and with an angular size between 1.5 and 4 arcminutes. Since FRII radio sources always have radio powers larger than $\sim 10^{26.2}$ W Hz^{-1} at 325 MHz, our imposed flux limit should only select sources with $z > 0.4$ and thus with linear sizes above 700 kpc (for $H_0 = 50$ km s^{-1} Mpc^{-1}).

2. First (preliminary) results

- In an area of roughly 1000 square degrees we have found 103 GRG candidates, indicating that there should be ~ 4000 of such sources distributed over the sky. This means that there is a substantial population of large FRII radio sources.
- Based on the maps from the FIRST survey, we find that 75% of the candidate GRGs contain cores, down to the FIRST flux limit of ~ 0.2 mJy at 1.4 GHz.
- There is no relation between flux and angular size in this sample.
- There is no strong indication that the slope of the differential source counts of GRG differs to within the errors to that of the whole population of radio sources at these flux levels. This indicates that evolution of the space density of GRGs follows that of the entire radio source population at these flux levels.

References

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