THE DISTANT DRAGNS SURVEY

J. D. B. LAW-GREEN
University of Manchester,
NRAL Jodrell Bank, Cheshire SK11 9DH, UK

1. Introduction

DRAGNs (*Double Radio sources Associated with Galactic Nuclei*, Leahy 1991) are the class of powerful extragalactic radio sources thought to be produced by the interaction of a jet with the ambient medium. They exhibit strong cosmological evolution in comoving number density; at $z \sim 2$ the "classical double" FR II DRAGNs were ~ 1000 times as common as they are now (Dunlop & Peacock 1990).

To understand this, systematic studies of complete DRAGN samples at low and high z and differing levels of flux density are required, in order to resolve the $P - z$ ambiguity. The Distant DRAGNs Survey is a long-term project to image with the VLA and MERLIN, matched samples of DRAGNs at high redshift.

2. Observations

The DDS sources are drawn from three optically almost complete low-frequency samples: 18 DRAGNs from 3CR (Spinrad 1985) at $z > 1.5$ and 23 from the overlapping "6C/B2 2-Jy" samples (Allington-Smith 1982, Eales 1985) at $z > 1.7$. Each source is observed at two frequencies from 408 MHz, 1.4 GHz and 5 GHz using MERLIN or VLA. Sub-kpc linear resolution is achieved at 1.4 GHz and higher, probing similar scales to HST imaging. Full polarimetry is obtained at 1.4 GHz and above.

The observations are currently $\sim 60\%$ complete. The project has "long-term" approval status from the MERLIN TAC.

3. Results

Interim analysis of the images obtained so far reveals several trends:-

R. Ekers et al. (eds.), Extragalactic Radio Sources, 513–514.
© 1996 *IAU. Printed in the Netherlands.*

https://doi.org/10.1017/S0074180900081675 Published online by Cambridge University Press

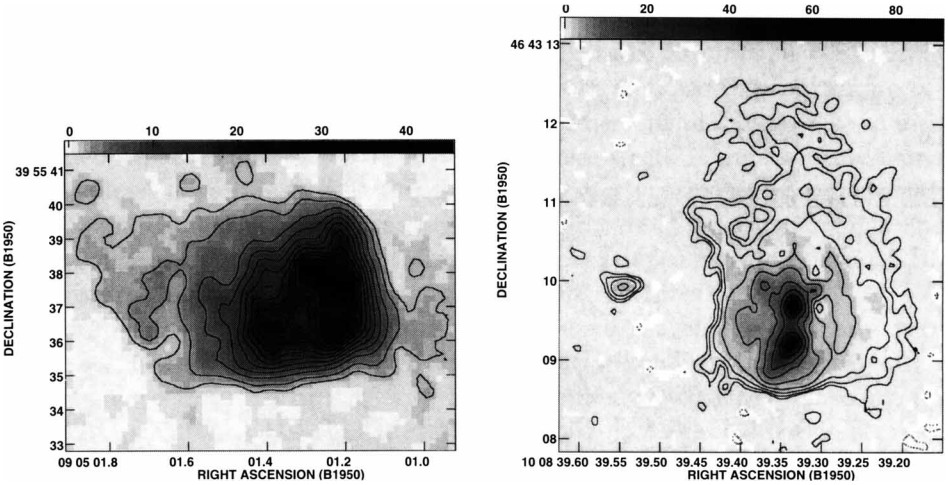

Figure 1. **Suspected lensing in distant DRAGNs: (a) "Quad" in western lobe of 4C39.24 (MERLIN 408 MHz; Law-Green et al. 1995). (b) Eastern lobe of 3C 239 with lensed counterimage (MERLIN+VLA 1.4/1.6 GHz MFS; Law-Green et al., in prep.). An $R = 21.8$ foreground galaxy lies very close to the counterimage.**

Lensing: Following the method of Kochanek & Lawrence (1990) the expected number of gravitationally lensed sources in our sample is 0.30 in a complete set of MERLIN 1.4 GHz images. We find at least two possible lenses (Figure 1) supporting the idea that distant radio sources are strongly amplified by lensing (Hammer & LeFevre 1989).
Frontflows: Very steep-spectrum ($\alpha > 2$) plumes beyond the radio hotspots seem common in distant DRAGNs, possibly relics of previous outbursts.
Giant: 4C39.24 was found during the DDS survey to be the most distant known giant radio galaxy (Law-Green et al. 1995). The source is 111″ across at a redshift of $z = 1.883$, equivalent to $D = 690$ kpc ($\Omega_0 = 0.2$).
Compactness: The compactness (fraction of flux in compact hotspots) of distant sources appears greater in less luminous DRAGNs.

References

Allington-Smith J. R., 1982, *MNRAS*, **199**, 611
Dunlop J. S., Peacock J. A., 1990, *MNRAS*, **247**, 19
Eales S. A., 1985, *MNRAS*, **217**, 149
Hammer F., LeFevre O., 1989, *ApJ*, **357**, 88
Kochanek C. S., Lawrence C. R., 1990, *AJ*, **99**, 1700
Law-Green J. D. B., Eales S. A., Leahy J. P., Rawlings S. G., Lacy M., 1995, *MNRAS*, in press
Leahy J. P., 1991, in Röser H.-J., Meisenheimer K., eds. *Jets in Extragalactic Radio Sources*, Springer-Verlag, Berlin, p.1

https://doi.org/10.1017/S0074180900081675 Published online by Cambridge University Press