

A COMPLETE SAMPLE OF FLAT-SPECTRUM RADIO SOURCES FROM THE  
PARKES 2.7 GHz SURVEY

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ABSTRACT. A full version of this paper was presented at Workshop on  
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## 1. INTRODUCTION

We are investigating a sample of flat-spectrum radio sources drawn from the Parkes 2.7 GHz survey (Bolton et al. 1979, and references therein) complete to 0.5 Jy. The sample covers 4.5 sr of sky and comprises 403 sources. Accurate radio positions have been measured for all sources (McEwan et al. 1975; Condon et al. 1977, 1978; Jauncey et al. 1982; Condon et al., unpublished data). Optical identifications are being made from the SERC/UKST IIIa-J sky survey. Redshifts are being sought with the Anglo-Australian telescope (AAT) (White et al. 1988, and references therein), with results so far for 270 sources. The program is aimed at determining in an unbiased manner the space distribution of quasars over a large area of sky.

## 2. DISCUSSION

- (i) These sources are drawn from a complete radio-selected sample which covers a large area of sky and thus avoids small-area effects.
- (ii) Even this radio-selected sample is not free from observational selection effects.
- (iii) Radio samples provide a method of detecting BL-Lac-type quasars in significant numbers.
- (iv) Accurate radio positions are being measured for all objects, allowing reliable optical identifications to the 22.5-mag limit

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of the UKST IIIa-J survey without any reliance on colour or morphology. The discovery of PKS 2000-330 ( $z=3.78$ ) was instrumental in revealing the existence of such high-redshift objects and demonstrating the properties by which they may be found. Those sources which remain unidentified to this limit are being sought on deep R CCD frames taken on the AAT.

- (v) We have optical spectral data on a large fraction of the quasar identifications. The redshift distribution shows no strong evidence for a redshift cutoff. Our Hubble diagram shows a large scatter in luminosity. We find equal numbers of low-optical-luminosity and high-luminosity quasars of high redshift, at variance with some optical searches.
- (vi) Our sample contains more objects with narrow Ly $\alpha$  equivalent widths than optically selected samples. The mean rest-frame equivalent width is narrower than that found for optical searches but has a very broad distribution. There is some evidence that the optical luminosity of these quasars also peaks at  $z = 2$ . Historically, a combination of these properties could spuriously enhance the number of quasars with  $z = 2$  found in optical searches, and conversely it could contribute to the difficulty in finding optical quasars with  $z > 4$ . A combination of the above factors would then serve to produce strong evidence for a steep-redshift cutoff in optically selected samples of quasars. Additionally it would produce spurious predictions for high-redshift numbers in the extrapolations of evolutionary models from lower-redshift quasar data.
- (vii) Complete radio samples such as this also serve as an extremely useful tool in revealing incompleteness and bias in optical surveys.

In this sample of 403 radio sources we have one strong gravitational lens candidate.

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