

CCD IMAGES OF SOUTHERN RADIO SOURCES

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ABSTRACT. We present here the first results of a program to obtain CCD images of a number of southern extragalactic radio objects using the 3.9-m Anglo-Australian telescope.

1. INTRODUCTION

This program is designed to:

(a) Study the optical morphology of a range of southern QSOs and radio galaxies in order to determine the properties of any underlying galaxies and the extent to which the local environment determines the radio properties.

(b) Carry out an accurate comparison of Southern Hemisphere radio and optical reference frames in order to improve the status of the astrometric frames in the south. This is essential to ensure accurate registration of optical and radio maps obtained at high resolution. An accuracy of about 10 milliarcsec will be needed to register images obtained with the Hubble Space Telescope and high-resolution radio maps - e.g. from the VLA and the Australia Telescope.

2. OBSERVATIONS

Images of radio objects are being obtained using a CCD camera at the prime focus of the AAT. Exposures are typically 300 s and taken through an R filter with the doublet corrector. The image scale is 0.49 arcsec per pixel. All images are being obtained through the Service CCD Observing program of the Anglo-Australian Observatory.

PKS 0439-433. The original optical identification for 0439-433, by Peterson and Bolton (1972), is confirmed on the basis of an accurate radio position measured at 2.3 GHz with the Tidbinbilla interferometer (see Jauncey et al., 1983). A redshift of $z = 0.594$ is reported by Wilkes et al. (1983). Accurate photometric magnitude ($V=16.36$) and colours ($B-V=0.28$, $U-B=-0.65$) have been determined by Adam (1978).

The CCD image (Fig. 1) was obtained in 1.7 arcsec FWHM seeing and clearly shows the radio object to be stellar-like, with an image which overlaps that of a nearby galaxy. The two objects are separated by 4.0 arcsec.

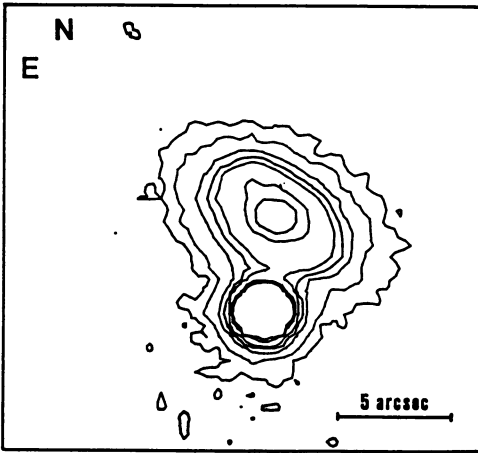


Figure 1. A red (R) filter CCD image of PKS 0439-433 obtained using the AAT. The QSO is the lower stellar-like object.

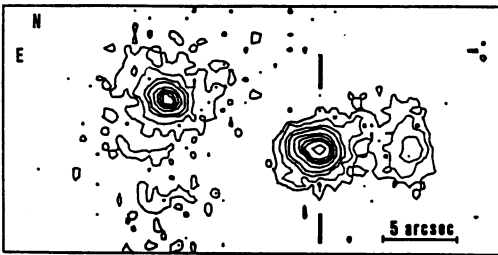


Figure 2. A red (R) CCD image of the radio source PKS 2250-412. The preceding object is a galaxy while the following is either a red star or a variable star (see text). The radio object shows a slight extension at P.A. 90° .

PKS 2250-412. The original identification as a 20 mag galaxy by Hunstead (1971) is confirmed. The SERC J sky atlas showed the candidate as stellar with a similar object preceding by 6.0 arcsec. The CCD image (Fig. 2), obtained in seeing conditions of 1.3 arcsec, shows three objects, the central one being the optical identification. The preceding object has a soft, galaxy-like appearance while the following stellar-like object is only just visible on the SERC J survey. This latter object is shown on the finding chart by Hunstead. It is either very red in colour, or variable, or both. The image of the identification shows structure extending about 2.5 arcsec at P.A. 90° . This extension occurs in the lower 20% of the image and is probably real, since stellar images in the field do not show similar extension.

3. CONCLUSIONS

Red CCD images of extragalactic radio source identifications reveal complex morphology for two southern radio QSOs.

4. ACKNOWLEDGEMENTS

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