

A COMPARISON OF THE STRUCTURES OF 3CR QUASARS AND  
BLANK FIELD RADIO SOURCES

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The purpose of this communication is to update our knowledge of the radio structural properties of quasars and blank field radio sources (blank field  $\equiv$  any radio source without an identification on the Palomar Sky Survey prints). The quasar sample consists of all sources (25) with angular sizes greater than 10 arcsec in the list of Jodrell Bank quasars observed by Owen, Porcas and Neff (1978). The blank fields consist of 16 3CR sources also with structures  $>10$  arcsec based on Cambridge 5 km telescope observations. The sources were selected in low-frequency surveys; their emission at  $\nu < 1$  GHz is dominated by extended components with steep spectra. Thus, both samples should be oriented randomly in space except for a slight bias to be in the plane of the sky.

Before this study we knew that blank field sources were almost never found to have central components at the 10 mJy level at 6 cm (e.g. Longair, 1975). On the other hand most, but not all, quasars were known to have central components at similar levels (e.g. Owen, Porcas, Neff, 1978). A few quasars were known to have jets (e.g. Potash and Wardle, 1980) but no such structures were known in blank field sources.

Our observations were made in the "A" array of the VLA at 6 cm. Typically, the blank fields were observed for 40 minutes with a 50 MHz bandwidth while the quasars were observed for 20 minutes with a 25 MHz bandwidth. At the time of this report we have self-calibrated all the blank field sources obtaining a 200-2000 dynamic range on each map. The quasars have not been self-calibrated and have a dynamic range of 100 to 400.

A summary of the results for the 3CR blank fields is as follows:

- 1) We detect central components in 7 out of 15 blank field sources with one questionable case. The central components range from 13 to 0.8 mJy with limits for the rest of 0.5 mJy; (see Table I)
- 2) No jets are found;
- 3) The central components agree in position with a previously sugges-

ted optical identification in all but the questionable case, 3C280. In this case there is a 39 mJy component very near one of the lobes with no obvious counterpart.

Table I  
3CR Blank Field Sources

	Central Components
3C13	<0.5 mJy
3C226	7.5
3C228	13.3
3C247	3.5
3C252	1.1
3C267	<0.5
3C280	(39.2)??
3C289	<0.5
3C322	<0.5
3C324	<0.5
3C325	1.2
3C337	<0.5
3C340	<0.5
3C356	<0.5
3C427.1	0.8
3C469.1	2.6

For the quasars we find that:

- 1) We detect all the central components at flux densities ranging from 6 to 500 mJy;
- 2) At least 20 percent of the quasars have radio jets;
- 3) No obvious differences exist between the lobes of the quasars and blank fields.

#### References

- Longair, M.S. (1975) M.N.R.A.S. 173, 309.  
 Owen, F. N., Porcas, R. W., and Neff, S. G. (1978) A.J. 83, 1009.  
 Potash, R. I. and Wardle, J. F. C. (1980) Ap.J. Letters 239, L42.