

HOT-SPOTS IN LUMINOUS EXTRAGALACTIC RADIO SOURCES

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Compact hot-spots in luminous extragalactic radio sources are often double on the scale of a few kpc (Laing 1981a). Examples are shown in Figures 1 - 3; the maps were made with the A and B configurations of the VLA. The general features are as follows:

- (a) It is usually possible to recognize a compact, "active" subcomponent within a radio lobe. This has a size of <1 kpc and may only contain a small fraction of the total flux of the hot-spot. It need not be at the leading edge.
- (b) More diffuse regions are often grossly offset from the source axis (e.g. 3C 196). In some cases, there is apparent inversion symmetry about the optical identification.
- (c) The characteristic morphology of a diffuse subcomponent is best illustrated by the eastern hot-spot of 3C 20, which is limb-brightened, with a circumferential magnetic field. The bright edge is on the side furthest away from the compact subcomponent.
- (d) The polarization structure in the diffuse subcomponents, like that in most extended radio lobes, can be explained if the magnetic field has been sheared so as to be tangential to the surface, but is otherwise random (Laing 1980; 1981b).
- (e) The most obvious explanation for the multiple structure is that the compact subcomponents represent the points of impact on the surrounding gas of twin beams from the associated galactic nucleus; if these alter their direction, then diffuse remnants may be formed. This idea would be consistent with the inversion symmetry seen, for example, in 3C 196.
- (f) A problem with this model is posed by the detailed morphology of the diffuse subcomponents: why should the bright limb be opposite the compact subcomponent, rather than at the leading edge of the source? An alternative picture, in which the diffuse subcomponents are formed by material escaping from the active regions, should also be considered.

REFERENCES

- Laing, R. A., 1980. *M.N.R.A.S.*, 193, 439.
1981a. *M.N.R.A.S.*, 195, 261.
1981b. *Ap. J.*, 248, 87.

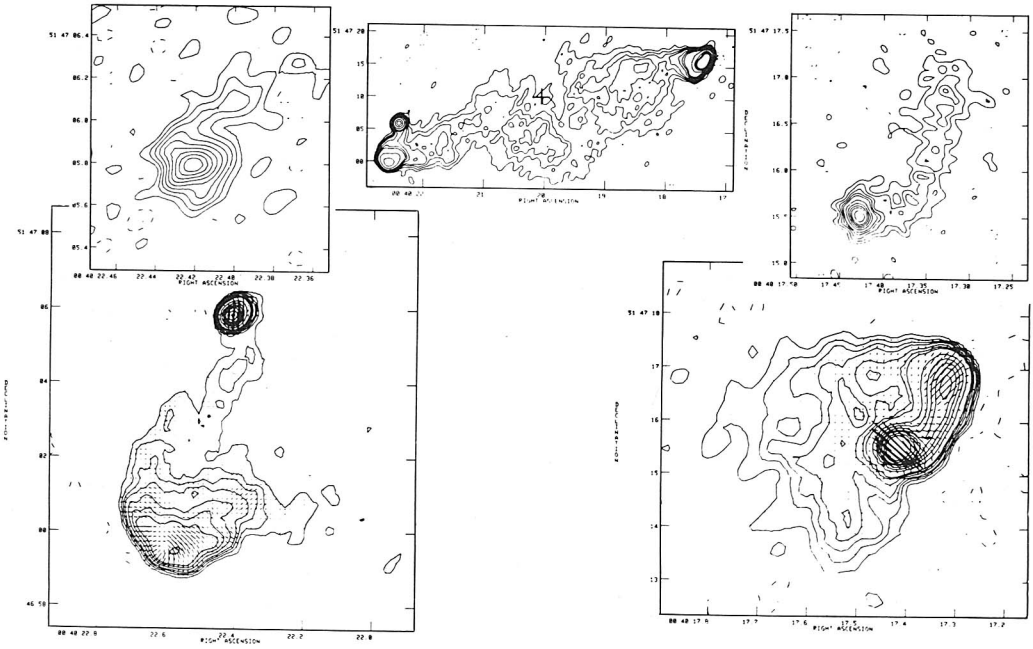


FIGURE 1 3C20

Centre: 4885 MHz, 1'1 beam

Bottom right and left: 4885 MHz, 0'35 beam

Top right and left: 15035 MHz, 0'14 beam

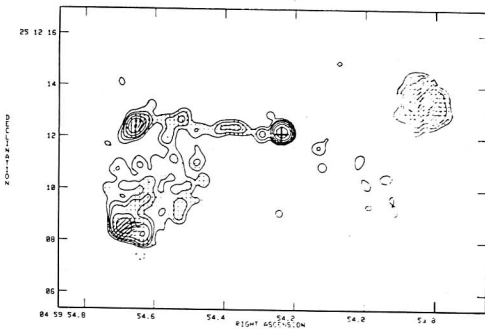


FIGURE 2

3C133 4885 MHz

Beam 0'4

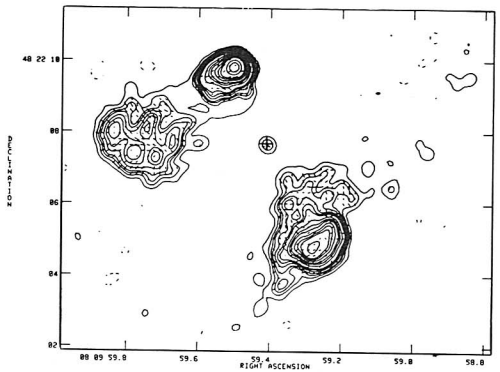


FIGURE 3

3C196 4885 MHz

Beam 0'35