

2.3 GHz VLBI Images of Southern Hemisphere Radio Galaxies and Quasars

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Abstract

The first images from VLBI data taken with Southern Hemisphere radio telescopes have recently been made as part of the SHEVE (Southern Hemisphere VLBI Experiment) collaboration. In this paper we present 2.3 GHz images of two quasars (PKS0237-233 and PKS0438-436) and two radio galaxies (PKS1549-790 and PKS1934-638).

In Figure 1(a) we show the image of the GPS radio galaxy PKS1934-638 which has a 'compact double' radio morphology (Tzioumis *et al.*, 1989, AJ, 98, 36) with two radio components separated by 83 pc (42 mas). This image includes data taken from Hartebeesthoek as well as 6 Australian antennas. The extra resolution from the trans-Indian Oceanic baselines enables the morphology of each individual component to be examined. The E. component is elongated parallel to the line joining the two components whereas the W. component is elongated perpendicular to this line. These very different morphologies are at variance with those expected if 'compact doubles' are young lobe-dominated radio sources, which would predict that this 'compact double' source should have two equal VLBI components that are 'edge-brightened'.

The 2.3 GHz image of the flat spectrum radio galaxy PKS1549-790 is shown in Figure 1(b) and was made from data taken with 6 Australian antennas. This source has an interesting curved 'jet' with the 'jet' initially heading in a NE direction followed by a large bend. The W. component of this source is simply fit by a 2 Gaussian component model: one component which is unresolved and may be tentatively identified as the 'core' and other which is an elongated Gaussian of axial ratio 3:1 with a major axis (FWHM) of 18 pc (23 mas) and maybe identified as the start of a 'jet'. The elongated

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E. component is fit by a single Gaussian model of axial ratio 10:1 and major axis (FWHM) of 30 pc (38 mas).

In Figure 1(c) we show the 2.3 GHz image of the GPS quasar PKS0237-233 which was made with antennas in Australia and one in S. Africa. The source is just resolved with data from Australia only but the extra baselines across the Indian Ocean enable two jet components in addition to the core to be clearly detected.

The 2.3 GHz image of the flat spectrum quasar PKS0438-436 (Figure 1(d)) was made with data from Australian antennas only and has a double morphology. Both components are resolved. The SE component is almost circular but the NW component has an axial ratio of 3:1 and the higher brightness temperature of the two components.

This paper has shown it is possible to obtain images with the present SHEVE array. We are continuing to monitor these sources at 2.3 GHz and 8.4 GHz.

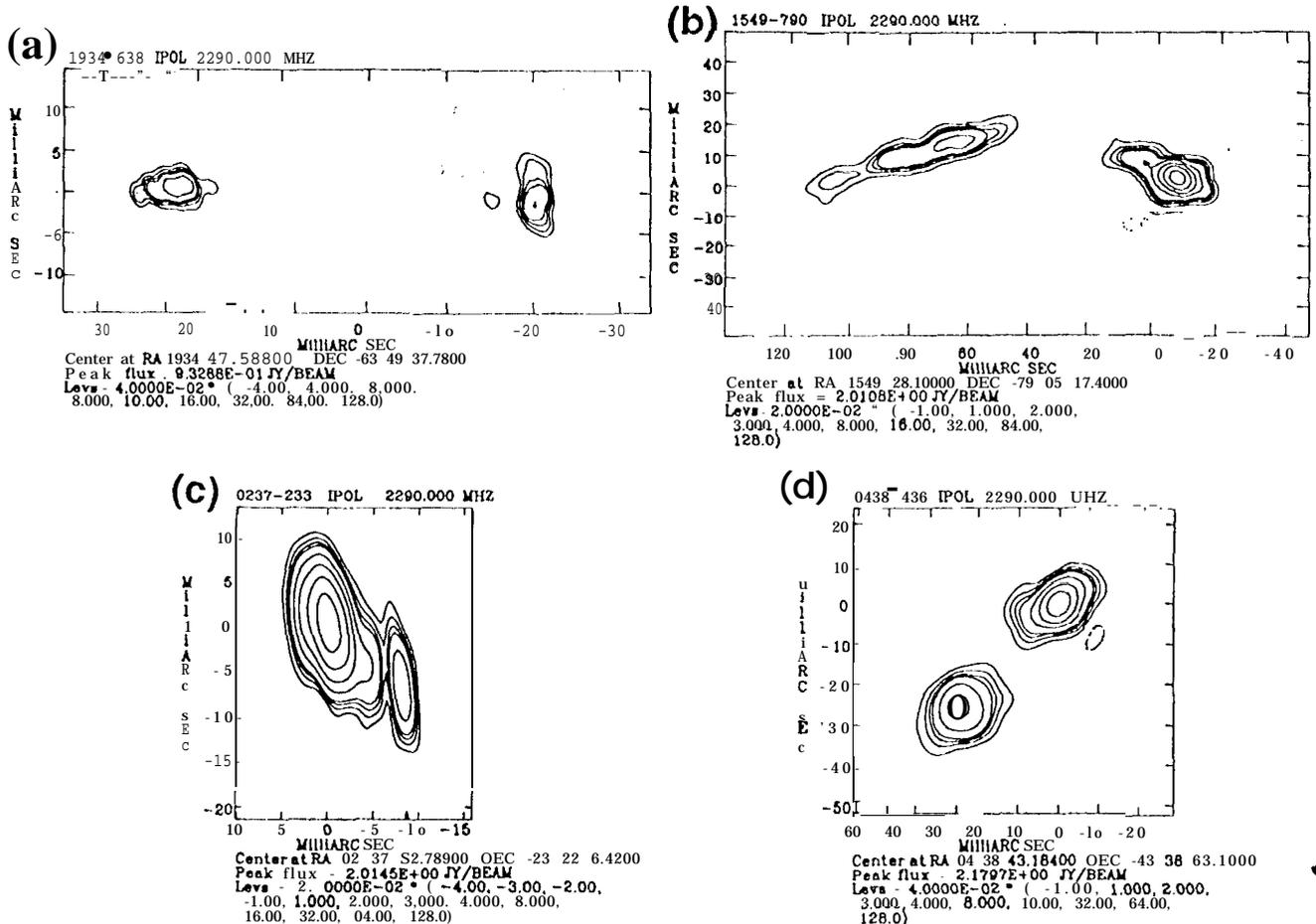


Figure 1. 2.3-GHz VLBI maps of (a) PKS1934-638 (b) PKS1549-790 (c) PKS0237-233 and (d) PKS0438-436