

## PKS 1117+146: GRAVITATIONAL LENS OR MICRO LOBES

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PKS 1117+146 is a high power radio source ( $L_{327\text{MHz}}=5.4\times 10^{26}$  W/Hz) identified with a galaxy of 20.1 red magnitude at  $z=0.362$  (de Vries et al. 1995). At this redshift  $1\text{ mas} \simeq 2.9\text{ pc}$  ( $H_0 = 100\text{ km/s}^{-1}\text{Mpc}^{-1}$ ). Based on the properties of the radio spectra, PKS 1117+146 is classified as a GigaHertz Peaked Spectrum source (GPS) (Stanghellini et al. 1990). The GPS are powerful but physically small (sub-galactic sizes) radio sources with turnovers in their radio spectra at  $\nu \sim 1\text{ GHz}$ . They are supposed to be isotropically emitting radio sources confined by exceptional dense circumnuclear gas (O'Dea et al. 1991) or still relatively young (Fanti et al. 1990). PKS 1117+146 is also a low frequency variable (LFV) with no sign of variability at  $\nu > 1\text{ GHz}$  (Patrielli et al. 1987, Mitchell et al. 1994). The low frequency variability is caused by propagation effects in the interstellar medium of our Galaxy (Mantovani et al. 1990, Spangler et al. 1993). PKS 1117+146 was observed with VLBI global arrays at 608 MHz (Patrielli et al. 1991), at 327 MHz (Altschuler et al. 1995), and at 1667 MHz (Bondi et al. 1996). All the maps are in agreement showing a compact double structure with components separated by about 70 mas. Flux densities and separation of the two components derived from VLBI and MERLIN (see below) maps are listed in Table 1. The flux ratios of the two components from the VLBI observations are very similar, and the spectral index is relatively flat ( $\alpha \simeq 0.3 - 0.4$ ), even if the strong low frequency variability can introduce uncertainties. The similarity of the VLBI morphology and spectral properties of the two components suggested that 1117+146 could be a possible gravitational lens candidate prompting for higher frequency observations. We observed PKS 1117+146 with MERLIN at 22 GHz in

Frequency MHz	Flux Density SE Comp.	Flux Density NW Comp.	d mas	p.a. degrees
327	2.08	1.74	70	-62
608	1.66	1.32	69	-68
1667	1.32	1.03	78	-60
23000	~ 0.11	~ 0.06	86	-62

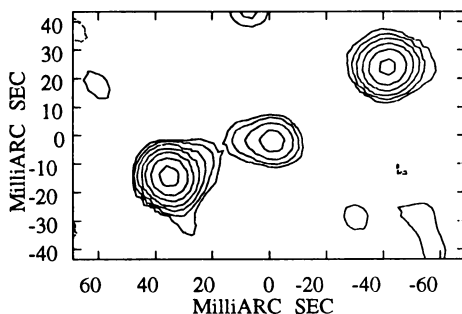


Figure 1. Merlin 22 GHz map

March 1993. MERLIN observations reveal for the first time a weak central component with a total flux density of about 20 mJy (Fig.1). From Table 1 we can note that the P.A. between the components is constant at all the frequencies while the separation between the peak flux densities significantly increases at higher frequencies. This is the expected behaviour if the 2 components are 2 lobes with hot-spot at the outer edges. The MERLIN map at 22 GHz seems to rule out the possibility that the morphology of PKS 1117+146 is caused by gravitational lensing.

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