UNIFORM APPARENT SUPERLUMINAL MOTION IN 4C39.25

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The radiosource 4C39.25 (0923+392) is an 18 mag quasar with a redshift of 0.699. Throughout the seventies its compact structure at centimetric wavelengths consisted of 2 components separated by an angle of about 2 milliarcseconds (mas). In the eighties the structure has been found to consist of 3 components (Marcaide et al.,1985; Shaffer et al.,1987). The angular separation between the "a" and "c" components (see Fig. 1, which shows our most recent map of this source made at a wavelength of 2.8 cm) has remained constant at about 2 mas, while component "b" is separating from component "c" at a rate which we estimate from 2.8 cm observations as 0.18 ± 0.01 mas/yr, and which translates into an apparent linear separation velocity of 4.0 ± 0.2 c (H_o=100 km/s/Mpc, q_o=0.5, c is the speed of light).

In Figure 2 we present maps obtained at 3.6 cm using data from geodetic IRIS-experiments (see Schalinski et al., this volume). The proper motion of component "b" relative to component "c" which we estimate at this wavelength is compatible with that estimated from 2.8 cm observations. It should be noted that this relative proper motion is very uniform. Component "b" is rapidly brightening, component "c" is progressively dimming, whereas the flux density of component "a" appears to remain rather constant in time. Detailed considerations about the evolution of each one of the three components will be presented elsewhere.

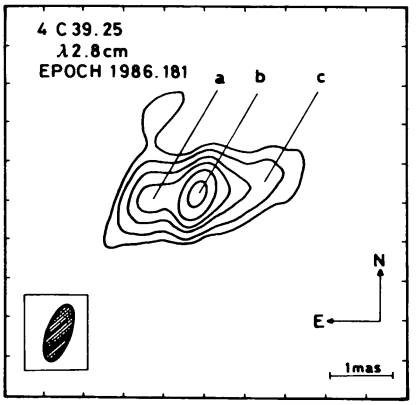

Figure 1. Hybrid map of quasar 4C39.25 made at 2.8 cm. Component "b" is moving superluminally to the east with respect to the other components. Contours:5,10,20, 30,50,80% of peak.

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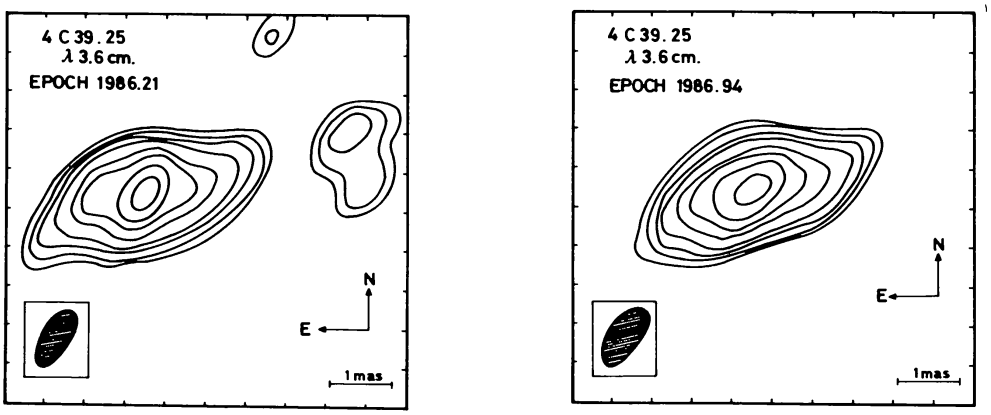

(a) (b)

Figure 2. Hybrid maps of quasar 4C39.25 made at 3.6 cm from geodetic IRIS experiments. Contours: 2,3,5,10,20,30,50,80% of peak.

Independent evidence for bulk relativistic motion in this source appears to come from the excess of calculated inverse-Compton flux density over the observed X-ray flux density, indicating a minimum Doppler-factor of 4.2 (Biermann et al.,1987). These authors find 4C39.25 to be the source with the strongest discrepancy between expected and observed X-ray flux density among those in a complete sample of 56 flat spectrum radio sources (Zensus et al.,1984).

Like the source 3C395 (Waak et al.,1985), 4C39.25 displays apparent superluminal motion relative to other parts of the compact structure which appear stationary with respect to each other. The evolution of 4C39.25 is such that unless something new, and unusual, again happens the source may be around 1991 -when we expect the apparent collision of component "b" with component "a"- an excellent geodetic and astrometric calibrator, since by that time the component "c" may be very dimm. A careful monitoring of the "collision" process before and after 1991 should provide new clues about the physics of the very compact radio sources.

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