# STRUCTURAL CHANGES IN CTA102

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## 1. Introduction

A study over several epochs and frequencies has demonstrated that the variability in CTA 102 (QSO 2230+114, z = 1.037) at $\lambda$<32 cm is mainly due to intrinsic processes (Rantakyrö et al. 1995, *A&A*, in press, hereafter R1995). Observations of CTA 102 with the EGRET telescope at the high-energy $\gamma$-ray waveband have shown that the source exhibits a strong $\gamma$-ray luminosity, $L_\gamma = 5 \times 10^{47}$ ergs s$^{-1}$ (Nolan, P.L., et al. 1993, *ApJ*, **414**, 82). This luminosity dominates the emission seen at all other wavebands, a common feature among BLAZARs. The common explanation for the high $L_\gamma$ is that the emission is the result of a beamed jet with a high Lorentz factor.

## 2. Observations and results

The maps presented here (Figure 1) are epochs 1992.45 (R1995) and 1994.18. Both maps are made with identical contourlevels. The position of the two central components in the source has been determined by fitting Gaussian point sources to the final images. Identification of which component that has moved where is problematical due to the long time between the epochs. Thus we give two alternatives for the movement of the outer component, **case 1:** where component E has moved to the position of G, and **case 2:** where component F has moved to the position of G. The results of the fits are presented in table 1. The $\lambda$1.3 cm observations suggests a very high proper motion, either a contraction or expansion. One should view this value with strong caution as we have only two sessions with somewhat



*R. Ekers et al. (eds.), Extragalactic Radio Sources,* 39–40.

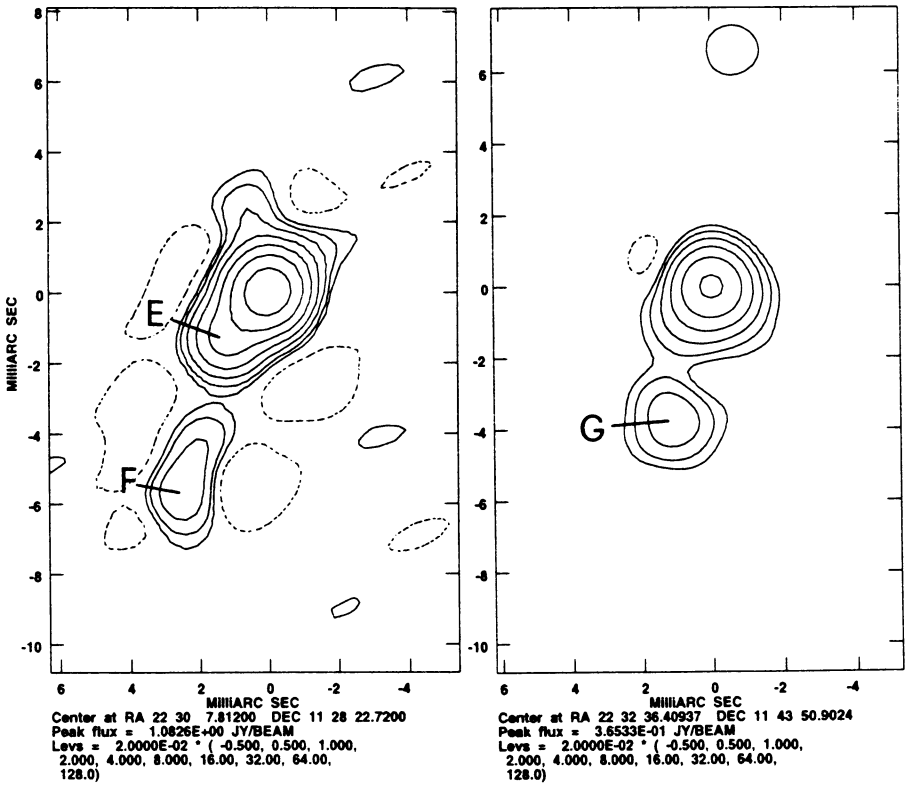


*Figure 1.* **Left:** EVN λ1.3cm 1992.45. **Right:**EVN λ1.3cm 1994.18

TABLE 1. Proper motion and distances from core for components. $r_0$ is the distance from the core.

| Epoch | ID [cm] | λ | $r_0$ [mas] | $\mu_{app}$ [mas/yr] | $\beta_{app}$ [v/c] |
|---|---|---|---|---|---|
| 1992.45 | E | 1.3 | 1.7±0.1 | | |
| 1992.45 | F | 1.3 | 6.2±0.5 | | |
| 1994.18 | G (case 1) | 1.3 | 4.0±0.1 | 1.3±0.2 | 36±6 |
| 1994.18 | G (case 2) | 1.3 | 4.0±0.1 | -1.3±0.3 | -36±8 |

sparse uv-coverage at λ1.3 cm (4 and 5 antennas respectively), and the relative time between epochs is large. We aim to investigate this source further, both at 22 GHz and at 3mm, and with both groundbased and satellite based telescopes.

https://doi.org/10.1017/S0074180900079924 Published online by Cambridge University Press