

# HIGH FREQUENCY RADIO OBSERVATIONS OF THE NUCLEUS OF CEN A

ZULEMA ABRAHAM

*Instituto Astronômico e Geofísico, Universidade de São Paulo  
CP 9638, 01065-970, São Paulo, SP, Brazil*

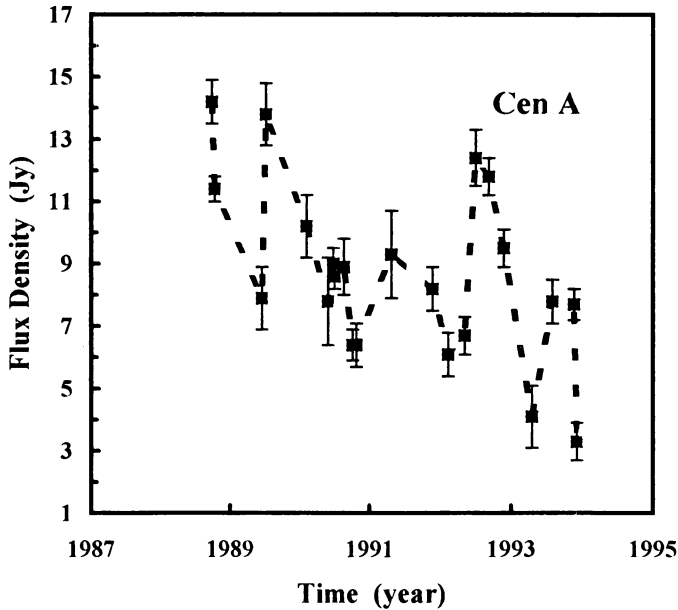
## 1. Introduction

Cen A (NGC5128) is a giant radio galaxy that in several ways behaves like a weak active galactic nucleus. It presents three pairs of radio lobes and a compact core with a one sided jet (Jauncey et al. 1995). The compact core is highly variable in wavelengths ranging from the radio region to X and  $\gamma$  rays (Kinzer et al. 1995). In the radio domain, the emission from the core dominates at high frequencies and a considerable effort was made to study variability at 22 and 43 GHz for more than ten years (Botti & Abraham 1995).

## 2. Observation and Results

The observations of the nucleus of NGC5128, reported here, were made with the Itapetinga radiotelescope at the frequency of 43 GHz, with a HPBW of  $2'.2$ , during the period 1988-1994. The observational procedure consisted of scans across the galaxy, passing through the core and the two inner lobes. Virgo A was used as a primary calibrator and the northern lobe, located at a distance of  $4'$  from the core was used as a secondary calibrator. The flux density of the central source was obtained after subtraction of the inner lobes, represented by two gaussian fits. Notice that this procedure is different from what it was used by Botti & Abraham (1993), where scans were made perpendicular to the plane of the galaxy. In that case, the contribution of the southern lobe was not completely eliminated and the calibration was not instantaneous, as in the data described here.

The results are presented in Fig. 1. We can see that the flux density of the core changed by a factor of two in time scales of the order of months,



*Figure 1.* Flux density as a function of time of the nucleus of Cen A, at 43 GHz

with very sharp increases and slower decreases in intensity. X-ray observations (40 - 500 keV) with the CGRO (Kinzer et al. 1995) did not show any correlation with our radio results, except for the 1991 observations, when the source presented strong intensity at both wavelengths. VLBI observations at 8.4 GHz between 1991 and 1994 (Jauncey et al. 1995) showed a core-jet structure, with the jet formed by several components separating from the core with constant velocity. The variability observed by us at higher frequencies could be correlated to variability in the intensity of the individual components, (e.g. 1991) or to the ejection of a new component from the core (e.g. 1988).

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## References

- Botti, L.C.L., Abraham Z. (1993) Long-term radio observation of the nucleus of NGC5128 (Centaurus A), *MNRAS*, **264**, 807-812
- Jauncey D.L. et al. (1995) Sub-Parsec Scale Structure and Evolution of Centaurus A (NGC5128) *Quasars and AGN: High Resolution Radio Imaging*. National Academy of Sciences Pub., in press.
- Kinzer R.L. et al. (1995) OSSE observations of gamma-ray emission from Centaurus A, *ApJ*, **449**, 105-118