

## THE TIME DEPENDENT RADIO SOURCES IN CEPHEUS A

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The radio object Cepheus A is a known region of star formation, in a region of very heavy optical obscuration. It has been observed at the VLA since 1980, and is known to consist of 2 lines of about 13 objects. In particular, the central region has been monitored since 1988, at L, C, and U-band, with resolutions of  $1''.0$ ,  $0''.3$  and  $0''.1$ , corresponding to linear resolutions of 700, 200 and 70 au. The presence of a highly variable Source 8 had been known since 1980, and was known to appear and disappear in a period of less than 1 year. However, a new and much more intense Source 9 was seen 1988 November 2. Over the period 1990 March 13 – 1990 May 8, it showed increases in flux density at C-band by a factor of nearly six times over a period of 50 days. Spectra have been obtained, and show that the flux density peaks at about  $5 \times 10^9$  Hz, and an increase in flux density is accompanied by an increase in the frequency of the peak. The variable sources are not resolved at  $0''.1$  at U-Band. This strongly suggests gyrosynchrotron emission from a region of size  $\sim 1$  au, magnetic field  $\sim 100$  G, temperature  $\sim 10^8$  K and density  $\sim 10^6$   $\text{cm}^{-3}$ . The variations in flux density are then due to increases in magnetic field, as might occur if the source were a protostar, or pre-main sequence star, which is rotating and shedding its magnetic field, by converting magnetic flux energy into particle energy. This would provide also a mechanism for molecular outflows. The observations and model will be described.

(See: Hughes, V.A., *Astrophysical Journal*, 1991 December 10).