# THE RADIO CORE OF MARKARIAN 348 +

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The type 2 Seyfert galaxy Markarian 348 (NGC 262) is a normal early-type disc galaxy (S0/a or Sa) surrounded by a very large HI envelope. The continuum radio source in the galaxy is unresolved by conventional interferometers on scales as small as an arcsecond, is variable on time scales of a few months, and is quite strong by Seyfert standards (300 mJy). Mkn 348 is relatively nearby, allowing one to study very small-scale structure in the galaxy (at the assumed distance of 60 Mpc ($H_o$ = 75 km/sec/Mpc), one light year subtends an angle of about one mas). Both the relative proximity and the radio source strength make it a good candidate for VLBI studies.

European VLBI observations of Mkn 348, presented here, show that the nuclear radio source is triple and linear in nature, is oriented along position angle 168 degrees, and has a total size of about 50 parsecs (see figure 1). Figure 2 shows the fit of the map CLEAN components to the visibility data. The map displayed accounts for all of the flux density from Mkn 348 at the time of the experiment; we therefore conclude that there is no significant emission outside some 0.2 arcseconds (60 pc).

Total flux density monitoring with the WSRT over a four-year interval show that the source is highly variable at 6cm, but only moderately so at 21cm, on time scales of a few months. A new outburst began in early 1982 as can be seen in figure 3. The variability provides indirect evidence for the existence of sub-mas core in Mkn348. Structural and spectral data combined indicate the the existence of an inverted-spectrum core and an optically thin steep-spectrum extended region (a jet?). Figure 4 shows our suggested spectral decomposition for the radio source in mid-1982.

These results support the hypothesis that radio sources in both type 1 and type 2 Seyfert galaxies are powered in the same manner as radio galaxies and quasars, by directed outflow of non-thermal material from a compact energetic nucleus.

A fuller account of this work will appear in Astronomy and Astrophysics.

+ Discussion on page 452



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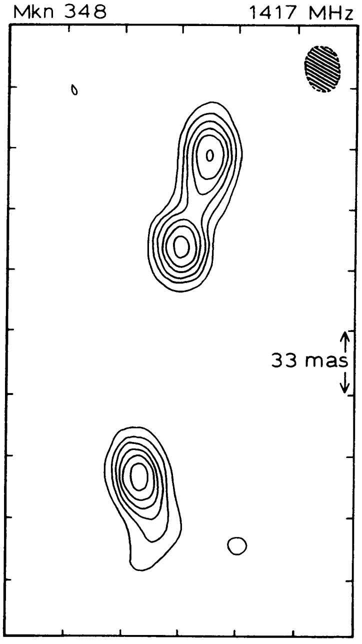


Figure 1. Map of Mkn 348, made using the European VLBI network at 21 cm.

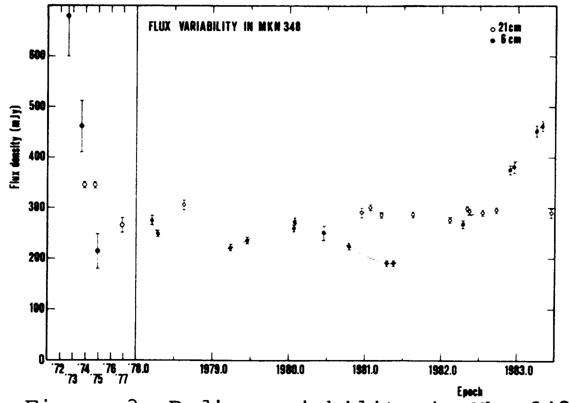


Figure 3. Radio variability in Mkn 348 at 6 and 21 cm, over a period of several years.

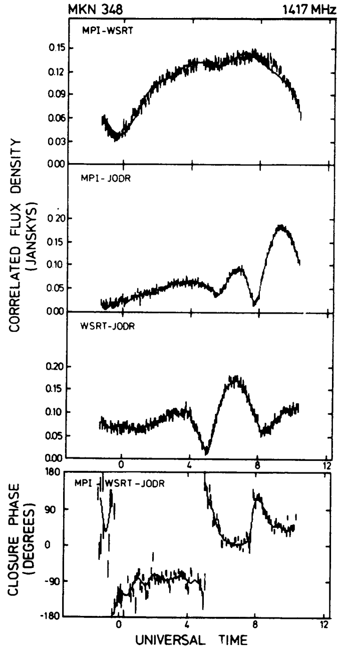


Figure 2. Visibility curves for Mkn 348. The line through the data shows the fit of the map in figure 1.

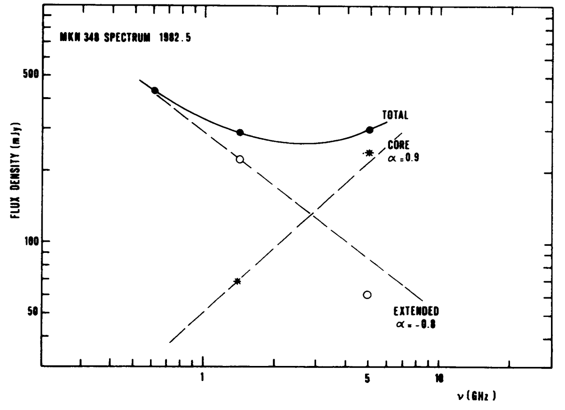


Figure 4. Suggested spectral decomposition of the radio source in Mkn348, mid-1982.

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