EVN-MERLIN OBSERVATIONS OF THE REMARKABLE LENS SYSTEM: 2016+112.

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1. Introduction & Analysis

2016+112 was observed simultaneously with the European VLBI Network (EVN) and MERLIN arrays during the May 1993 *joint* EVN-MERLIN session at $\lambda 18$ cm. Common elements to both arrays included the Jodrell Bank 76-m Lovell and 32-m Cambridge telescopes. In order to simultaneously map the entire 4 arcsec^2 field of view, various wide-field mapping techniques were employed (see Garrett et al. 1994b).

2. Results & Conclusions

Earlier MERLIN $\lambda 6$ cm observations by Garrett et al. (1994a) revealed C to be comprised of two components - C_1 and C_2, separated by ~ 112 mas. Garrett et al. (1994a) suggested that C_2 was a third lensed radio image of the same background source that gives rise to images at A and B. The joint EVN-MERLIN map, with a resolution of 50 mas, is shown in Fig 1 (left). The EVN maps, with a resolution of 15 mas, show A and B to be partially resolved but C is well resolved. The MERLIN component C_2 is identified in the EVN map as an unresolved component but C_1 is further resolved into three components designated: C_{11}, C_{12}, C_{13}. Together with C_2 these three components form a remarkable chain which spans ~ 200 mas. The resolved structure of C_1 seems at odds with its traditional identification with the galaxy at C, though this still remains a possibility. Taking into account the flat spectrum nature of C_1 and its bizarre resolved radio structure we

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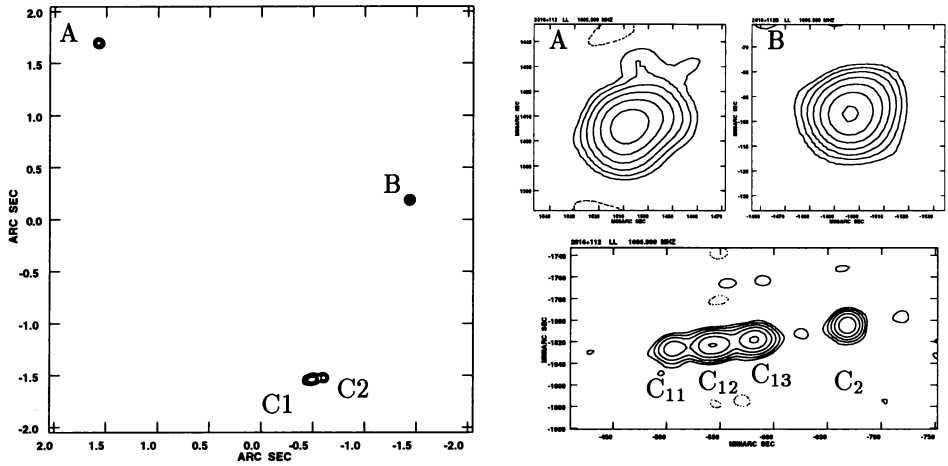

Figure 1. Left: the λ18 cm wide-field 50 mas resolution EVN-MERLIN maps of 2016+112 and Right: the λ18 cm 15 mas resolution EVN only maps of 2016+112 A,B,C1,C2.

are inclined to the view that part, if not all, of the emission at C_1 is in fact lensed in some way (see companion poster - Nair & Garrett these proceedings).

2.1. COMPARISON OF THE MERLIN 6CM AND EVN-MERLIN 18CM MAPS

One of the primary motivations for obtaining a joint λ18 cm EVN-MERLIN map is to allow the determination of an accurate flux ratio of C_2:B between λλ6 and 18cm. If C_2 is indeed a third image then the flux ratio C_2:B should be the same at both wavelengths, since gravitational lensing is achromatic. At λ18 cm MERLIN does not have the required resolution to resolve C_1 and C_2. However, it turns out that the joint EVN-MERLIN λ18 cm observations are well matched to the λ6 cm stand-alone MERLIN observations.

The ratio C_2:B is 0.41 from the joint λ18 cm map and 0.26 from the MERLIN λ6 cm map. At first sight this result argues against a "third image" interpretation for C_2 but see Nair & Garrett (these proceedings).

References

Garrett et al., 1994, MNRAS, 269, 902.
Garrett, M.A., Patnaik, A.R. & Porcas, R.W., 1994b, in Proc. EVN/JIVE Symposium, Torun, ed. Kus et al., TRAO, 73