

Recent VLBI Results on SN 1986J and the Possibility of FRBs Originating from Inside the Expanding Ejecta of Supernovae

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I present recent VLBI results on SN 1986J, which is one of only a handful of supernovae where the radio emission of the expanding ejecta can be resolved using VLBI. SN 1986J is unusual in that a compact synchrotron radio emitting component appeared in the centre of the expanding shell of ejecta about 14 yr after the explosion, and now dominates the VLBI image. The central component may be due to a newly formed pulsar wind nebula, or an accreting black hole, or it may be due to interaction of the supernova shock with a highly structured environment left over from a progenitor which was in a close binary system. I present our latest VLBI image of SN 1986J and discuss the constraints on the nature of the central component.

Although no Fast Radio Burst (FRB) has been observed from SN 1986J, its central component presents us with a unique opportunity to observe radio signals which have propagated through the ejecta of a young SN, which provides strong observational constraints on the propagation of FRB signals through such environments. We conclude that at least for Type II SNe, the SN environment remains opaque to FRB signals for several decades, by which time the dispersion measure produced by the ejecta is much smaller than typically seen for FRBs.