

Title

Long-term monitoring of the compact persistent counterpart to the repeating FRB 20121102A

Abstract

Fast Radio Bursts (FRBs) are micro- to millisecond-duration pulses occurring at both Galactic and cosmological distances. As more FRBs are being localised, we are learning that some fraction have compact persistent radio sources (PRSs). The presence of PRSs provides a unique insight into the nature of the counterparts, their evolution and the energetics and their relationship to the progenitors of FRBs. As the origin of FRBs is still unknown, their nature may be revealed from studying their local environments. MeerKAT observations of repeating FRB 20121102A in 2022 have shown a simultaneous significant decrease in dispersion measure (DM) of the bursts, flux density of the PRS and signal-to-noise ratio of the bursts. The decrease in DM is consistent with the value reported by FAST. We propose to monitor the PRS associated with FRB 20121102A over 12 months to study its variability, possible correlation between the variability of the PRS and the repeat bursts, and study the evolution of the magnetic fields.