Title

Monitoring the activity of FRB~190520B and its persistent radio source

Abstract

The local environment of actively repeating fast radio bursts (FRBs) has been shown to be extremely complex and highly magnetized. FRB 20190520B has the largest confirmed host dispersion measure, shows extreme sign change of rotation measure, and is only the second FRB source confirmed to be associated with a compact, persistent radio source (PRS). These observations bring us one step closer to understanding the origin of this unique source and suggest that the FRB source could be in a binary system with a magnetized companion star, or in the vicinity of massive black holes. In the 2022 semester, we were granted MeerKAT observing time and successfully detected the PRS in the UHF band. Here we propose to carry out fortnightly monitoring of both the FRB and its PRS with MeerKAT. The unique capability (i.e. simultaneous imaging and beamformed observing) of MeerKAT allows us to investigate the correlation between the activity of FRB 20190520B and the PRS. Thanks to the frequency coverage with UHF and L-band, we will also be able to study the wideband spectrum and polarisation of the PRS and search for FRB bursts at low frequencies. These observations might shed critical light on the origin of the FRB and its PRS.