

Title

MeerKAT follow-up of compact object mergers in LVK-O4

Abstract

On 2017 August 17, Advanced LIGO/Virgo (ALV) achieved their first direct detection of gravitational waves (GW) from a binary neutron star merger. The subsequent detections across the electromagnetic (EM) spectrum revolutionized the field and the study of GW sources remains arguably the highest impact focus in the field of time domain astronomy. Detection of an EM counterpart is essential to fully characterize a GW event, providing precise location and distance, the astrophysical context, and the merger hydrodynamics. In particular, non-thermal radio emission uniquely probes the energetics, local environment, and outflow velocity structure. New detections from the next GW observing run (O4) will further characterize the merger population and clarify connections with short gamma-ray bursts. Here, we seek to maximize the science output of O4 by performing up to two dedicated radio searches with MeerKAT following neutron star-containing mergers with a clearly-identified EM counterpart at other wavelengths. MeerKAT is the only Southern radio telescope with sufficient sensitivity and resolution at low frequencies to obtain these critical data.