MKT-22084

Early Radio Emission from Tidal Disruption Events

Abstract

Tidal disruption events (TDEs), when a star is disrupted by tidal forces around a supermassive black hole (SMBH), are a unique opportunity to study formation of jets from an SMBH in real time, as well as being a probe of the environment around an SMBH. TDEs can produce bright radio emission that lasts from months to years. There are many open questions about TDEs for which radio observations can provide crucial input, including: Does the TDE radio emission arise from jets, or wide-angle outflows, or winds, or shocks in tidal streams? Is there a dichotomy of radio-loud and thermal, radio-quiet TDEs? What is the profile of the gas density near SMBHs? Only ~20 TDEs have been detected in radio at present, not enough to address these questions. Observations of the evolving spectral energy distribution are crucial to answering them, and MeerKAT's 0.54 to 1.7 GHz frequency coverage provides a unique capability for TDE observations. We propose MeerKAT observations both to monitor existing targets and to observe new TDEs discovered during the upcoming observing cycle.