

Proposal Abstract:

Fast multiwavelength variability from radio to X-ray on timescales of milliseconds to seconds, such as low-frequency quasi-periodic oscillations (QPOs) or flares, is commonly seen in black hole X-ray binaries. These variabilities are believed to originate from instabilities/geometric effects of the inner accretion flow or relativistic jets. Therefore, the study of the multiwavelength variability can help us better understand the accretion process under strong gravitational fields and the mechanism for the relativistic jets. However, the fast variability in the radio band has not been widely studied. FAST is an ideal telescope to detect fast radio variations. In this proposal, we ask for 30 hours of FAST ToO observations to study the origin of the fast variability and its association with relativistic jets. Simultaneous Insight-HXMT observations will be also performed to better constrain the physical processes over a broad range of energies spanning ten orders of magnitudes in frequencies.