Proposal Abstract:

Brown dwarfs are a class of celestial objects intermediate in mass between low-mass stars and giant gas planets. Some of them could host strong magnetic field which is a result of their interior dynamo process. Radio observations are the most powerful probe of their magnetic field environment and related auroral activity, though the origin of the radio emission remains enigmatic. One missing puzzle piece is the sub-second or millisecond structures in the emission, which encode information about the dynamics of the emitting plasma and the topology of the magnetic field. We have demonstrated the utility of millisecond-scale radio bursts from M dwarfs in previous FAST observations. Here we propose to apply this method to six brown dwarfs. Their first round observations will be conducted to cover at least three rotation periods. Follow-up monitoring will be scheduled on two prior targets based on the first round results, to trace rotational modulation of the emission and long-term variation to understand the magnetic field geometry and its evolution.