

**Proposal Abstract:**

Understanding the jitter noise which results from the single-pulse phase and shape variations is important for the detection of gravitational waves with pulsar timing array. Jitter noise is expected to dominate the white noise budget for highly sensitive telescopes. It is therefore essential to determine whether the jitter process can be modelled and then mitigated. FAST provides us a great opportunity to study the jitter noises of MSPs. In this proposal, we will measure the level of jitter noise in a sample of MSPs, and then we will examine the achievable timing precision using a subselection of single-pulses with a specific range of peak intensity. The outstanding polarization properties of the FAST implies that we can measure the jitter noise level of the linear and circular polarization states as well as in the total intensity. We will also study the correlation of jitter noise and polarization to see if we could use polarization information to reduce jitter noise and improve the timing precision.