

Proposal Abstract:

Our previous pulsar timing observations by FAST show that the timing spectra of a few millisecond pulsars consist of a slow arising and sharp drop in the frequency regime of $\sim 1\text{-}200\text{Hz}$. Subsequent observations show that the spectra vary in a time-dependent manner. In order to investigate origin of these timing spectra and constrain the gravitational wave signals via the spectra, we propose to make 27 hours timing observations by FAST to monitor the variation of pulse arrival time of 18 millisecond pulsars. These observations will allow us to investigate the modulation of high frequency GW signals, presumably generated from black hole binaries with masses less than $\sim 106M_{\odot}$, on the periodic radio pulses, and put limits on the GW amplitudes in a wide GW frequency range. These observations can also allow us to investigate the spatial correlation and origin of timing noise (e.g. jitter noise) of the pulsars.