PID:PT2022_0023

Abstract:

Pulsar mass measurements help put strong constraints on the equation of state (EOS) of ultra-dense matter. Existing timing data enable a significant Shapiro delay measurement for one of our millisecond pulsars, we get an estimation of the pulsar mass: 2.20+/-0.15 Msun, indicating it is an another 2 Msun pulsar. And the center value of current estimation is significantly larger than the mass of the most massive pulsar J0740+6620 (2.08(7) Msun), however with larger mass measurement error due to the low amplitude of the Shapiro delay signal in this binary system. If such a high mass is further confirmed, and it would put the most stringent constraints on EOSs of ultra-dense matter. Here we propose FAST observations to this pulsar at several orbital phases including the superior conjunction, to measure the Shapiro delay more precisely, and ultimately reduce the mass measurement error down to 0.1 Msun.