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Abstract:

At least 90 gravitational wave (GW) events have been observed by the advanced Laser Interferometer gravitational-Wave Observatory (aLIGO) and VIRGO collaboration in the GW frequency range of  $\sim 10$ -1000 Hz since 2015. These GW events are believed to have originated from coalescences of distant binary black holes, double neutron stars, and black hole-neutron star binaries. Similar to the nHz GW signals, these high frequency GW signals may also have influences on the pulsar arrival time. We propose to investigate the variation of pulsar timing residuals in the frequency range of  $\mu$ Hz to 100Hz using high sensitive and high time resolution pulsar observations by FAST, which is potentially caused by the GW signals from the ultracompact binaries. By analyzing the single pulses of three millisecond pulsars observed in 2021, we find that there are periodic resonances and blue tilt background components in their timing residuals in the frequency range of  $\sim 1$ -100Hz, which may have association with the jitter noise of pulsars or the GW background. New observations are required to obtain more convincing data to confirm the findings and make efforts to explore the relation between the pulsar timing residuals and GW signals in the wide frequency range.