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Abstract:

Pulsar observation, particularly the timing observation, provides high precision data to study the fundamental physical and astronomical problems, e.g. nano-Hertz gravitational wave detection, gravity theory test, solar system dynamics measurement, and galactic dynamics. Pulsar timing also paves the way to future engineering application, such as the accurate frequency-time standard with stability better than  $1\text{E-}15$  and the reference frame applicable to the Galactic scale. However, most of pulsar observations are usually limited by signal-to-noise ratio. In the current proposal, we propose to further increase the FAST sensitivity with the phase array techniques. We will try to coherently add the data from radio telescopes of Large European Array of Pulsars. Two major outcomes are: 1) we will be able to create the most sensitive radio array in L-band, and enable a large number of experiments not possible before. 2) we will understand the tech of coherently adding telescope signal of FAST type, which serves as an engineering pilot for the FASTA (FAST extension array), one of the key goal to develop in China for coming 10-15 years.