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Abstract:

Globular Clusters (GCs) are fascinating stellar collections where many peculiar pulsar systems are found. Here we propose to continue our regular monitoring observation of GC M2 and M14 which in total host ten binary millisecond pulsars (MSPs) discovered by FAST. The new observations will enable us to measure new astrometry and orbital timing parameters, improve the current measurement precision and find new pulsars. In particular, they are necessary for constructing phase-coherent timing solutions for M2E, M2F and most pulsars in M14. These measurements would provide opportunities for binary-pulsar experiments on testing gravity theories and constraining the state of matter in the ultra-high-density regime. They could be used to study the properties of the cluster itself and probe the ionic and magnetic environment in the Galactic halo. The new observations will enable additional searches for new pulsars in these two clusters, improving the opportunity to find some more exotic pulsar systems, such as a MSP-black hole binary.