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Abstract:

Gamma-ray binaries are an elite sub-group of X-ray binaries with multi-wavelength emission from radio to TeV energies. The nature of the compact objects in most of these systems is unknown, with leading theories invoking a black hole or a pulsar. The unprecedented sensitivity of FAST will enable us to carry out the most sensitive searches for radio pulsars in gamma-ray binaries and help reveal the nature of their compact objects. In this proposal, we aim to search for radio pulsation from the gamma-ray binary HESS J0632+057 with FAST. We propose five 2-hour observations on HESS J0632+057, evenly distributed in the orbit, separated by ~ 64 days. The discovery of a pulsar in HESS J0632+057 will result in huge progress in our understanding of gamma-ray binaries.