

Proposal Abstract:

With FAST (PT2020_0096), we have been monitoring two of the most apparently pulsar-rich globular clusters (GCs), namely M5 and M15. Our FAST observations have resulted in the discovery of M5G, a new 2.7-ms pulsar in a tight black widow binary system. This has increased the number of known pulsars in M5 to seven. Moreover, we have detected 14 out of the 15 known pulsars in these two GCs. We thus propose high-sensitivity FAST follow-up observations to continue extending and improving the timing solutions to very high precision for all the pulsars in these clusters. The proposed observations can also be used to search for new pulsars. For the two FAST pulsars M5F and M5G, the proposed observations will improve the timing residues. For the two FAST discovered pulsars M5F and M5G, the proposed observations will improve the timing residues. For other pulsars, the timing baseline can be extended to ~ 20 years or more. The continuous monitoring of these two prolific GCs will build up powerful diagnostics for the properties of the pulsars and the dynamics of their host GCs.