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Abstract:

CTB 87 (G74.9+1.2) is a plerionic supernova remnant (SNR) which harbors a pulsar candidate. We have succeeded in detecting radio pulses from this candidate in the 2019 FAST "Shared Risk" observation. This proves to be the first SNR-related pulsar discovered by FAST, which could be named J2016+3711. Ten follow-up timing observations spanning over three months, which aimed to precisely constrain the astrophysical properties of the pulsar, were made in 2021. Although these observations robustly confirm the pulsed radio emission they turn out to be inadequate to determine the pulsar's period derivative, a value necessary to estimate other properties. We propose to perform further follow-up timing observations on the pulsar J2016+3711. The proposed observations will not only be used to determine the pulsar's period derivative, but also help to 1) Pin the accurate position of the pulsar and improve its timing ephemeris; 2) Derive the characteristic age of the pulsar; 3) Estimate the surface magnetic field strength of the pulsar; and 4) Estimate the energy loss rate of the pulsar and test the Seward-Wang empirical relation.