

Proposal Abstract:

Rotating Radio Transients (RRAT) and nulling pulsars are known for their irregular nulling behaviors, being distinguished as two subgroups of Rotation-Powered Pulsars (RPP). In a recent single-pulse search of the Commensal Radio Astronomy FAST Survey (CRAFTS) archive data, one peculiar pulse was detected to show a narrow-band spectrum. The Dispersion Measure is $\sim 20 \text{ cm}^{-3} \text{ pc}$, indicating a close distance to our solar system. Encouraged by this discovery, we proposed a series of localization and tracking observations to confirm and localize this peculiar object, as the regular project PT2023_0090. 7 pulses were detected in the last session, showing intrinsic narrow-band spectra while no spin period could be determined due to the irregular off fraction, with a pulse event rate up to 4/hr. Our preliminary result suggests that this source could be a neutron star, according to the closest waiting time of $\sim 15 \text{ s}$. Further tracking observations will validate its origin: an extreme nulling pulsar, RRAT, or an isolated long-period magnetar. The narrow-banded emission of this peculiar radio transient will also help us figure out the intrinsic mechanism as the specific configuration of its radiation region.