

PID:PT2022_0070

Abstract:

We propose 33 hours of observation of the Five-hundred-meter Aperture Spherical radio Telescope in L band to confirm the nature of 14 neutron star candidates discovered in LAMOST survey. The candidates were identified as single-lined spectral binaries with large radial velocity variation in LAMOST time-domain spectral data, subsequent calculation by combining the LAMOST radial velocity and archived photometric light curves show that the unseen companion in the binary system has a mass higher than 1 solar mass. Those candidates were not archived in the previous radio or X-ray database, therefore, with its high sensitivity facility, the FAST telescope is the best instrument to quickly discern the nature of the unseen companion in the mass overlap region between the white dwarf and neutron star. A better-determined nature of sufficient samples will significantly improve our understanding of the formation and evolution of the massive stars and the characteristic of the neutron stars in the binary systems. The proposed observations will thus significantly improve the scientific value of these discoveries and can be published immediately after reduction along with the discovery paper.