PID:PT2022_0101

Abstract:

We report a single-line binary 2MASS J15274848+3536572 (hereafter J1527) consisting of a K main-sequence star and an unseen object. Using 12 epochs of LAMOST observation， we obtain a radial velocity semi-amplitude, linked to the ellipsoidal variations measured by the BVR-band light curve. The modelling of radial velocity and detailed models of the light curves gives a mass function of ~ 0.149 MSun an inclination of 47.08^{\circ}, and a mass ratio of 0.62, resulting in a mass of the dark companion of 1.00 MSun and a K main-sequence star of 0.62MSun. Therefore, we propose to search for radio pulsations from the system J1527 based on an unprecedented sensitivity observation of FAST. If the radio pulsations is detected from the system J1527, it imply the dark companion is a neutron star, making it the smallest neutron star to date and the closest to Earth.