Is a compact object in MXB 1728-34 the strange star?

A. Majczyna[1], J. Madej[1], M. Należyty[1]

[1]Warsaw University Observatory, Warsaw, Poland

ABSTRACT: We analyzed archival X-ray spectra of MXB 1728-34 obtained in 1996-99 by the Proportional Counter Array on board of the RXTE satellite. X-ray spectra were fitted to our extensive grids of model atmosphere spectra to determine the effective temperature T_{eff} on the neutron star surface, logarithm of surface gravity $\log g$, and the gravitational redshift z simultaneously. We have chosen fitting by numerical model spectra plus broad Gaussian line, modified by interstellar absorption and the absorption on dust. We arbitrarily assumed either hydrogen-helium chemical composition of a model atmosphere, or H-He-Fe mixture in solar proportion. The statistically best values of $\log g$, and z subsequently were used to determine mass and radius of the neutron star. We obtained the best values of the parameters for the neutron star in X-ray burst source MXB 1728-34: mass either $M = 0.40$ or $0.63 M_{\odot}$ (for H-He or H-He-Fe models, respectively), radius $R = 4.6$ or 5.3 km, $\log g = 14.6$ or 14.6 and the gravitational redshift $z = 0.14$ or 0.22. All the above parameters have rather wide 1-σ confidence limits. Their values strongly support the equation of state for strange matter in MXB 1728-34.