

Abstract Submitted
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Finding of a new nuclear matter parameter characterizing low-mass neutron stars HAJIME SOTANI, National Astronomical Observatory of Japan, KEI IIDA, Kochi University, KAZUHIRO OYAMATSU, Aichi Shukutoku University, AKIRA OHNISHI, Yukawa Institute for Theoretical Physics — Neutron star could be a suitable laboratory to see the physics under extreme state. In practice, it is expected that the observations of neutron stars enable us to constrain the equation of state (EOS) of neutron star matter. However, the EOS for density region a few times larger than the saturation density is still very uncertain. Thus, the direct discussion of EOS may not be so easy, even if the mass and radius of neutron stars would be observationally determined. On the other hand, in the case of a low-mass neutron star whose central density is relatively small, the parameters characterizing the EOS of nuclear matter near the saturation point should become important to describe such an object, where one could not care the uncertainties in high density EOS. So, we systematically investigate the dependence of the mass-radius relations of low-mass neutron stars on the saturation parameters in an EOS model that is consistent with empirical masses and radii of stable nuclei. Then, we are successful to find a suitable parameter describing low-mass neutron stars, which is the combination of the parameters that characterize the density dependence of the symmetry energy (L) and the incompressibility of nuclear matter (K_0).

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