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Is the Ni's solution of the Tolman-Oppenheimer-Volkoff problem without the maximum-mass limit applicable to the real neutron stars? A discussion

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In 2011, Jun Ni published solution of the equations in the classical Tolman-Oppenheimer-Volkoff (TOV) modeling of spherically symmetric neutron star. The Ni's solution implies no upper-mass limit and the outer surface of modeled object always appears to be above the event horizon. In fact, Ni found an infinite variety of sets of the TOV-problem solutions. The original Oppenheimer-Volkoff result provides only a single set from this variety offered by general relativity. As originally Openheimer and Volkoff as Ni assumed the positive energy density and pressure (or zero in the vacuum outside the object). And, the gravity of every mass element of the object had the attractive character. Ni noted that this type of solution cannot be obtained in Newtonian physics. However, general relativity may not obey the limitations sourcing from the Newtonian gravity and, thus, it seems that the neutron-star models based on the Ni's solution are still applicable on real compact objets. We discuss the relevance of main objections against this applicability.

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