

Abstract Submitted
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Analytic I-Love relation for realistic neutron stars NAN JIANG, KENT YAGI, Univ of Virginia — There exist approximate universal relations connecting properties of neutron stars (NSs) that are insensitive to the equation of state with important applications on probing fundamental physics. To date, analytic works on universal relations for realistic NSs are lacking, which may lead to a better understanding of their origin. In this talk, we focus on I (moment of inertia)-Love (related to tidal deformability) universal relation and derive related approximate relations analytically. To achieve this, we construct analytic slowly-rotating/tidally-deformed NS solutions starting from an extended Tolman VII model that accurately describes non-rotating realistic NSs, allowing us to extract I and the Love number. The field equations are solved analytically by expansion about the Newtonian limit and keeping up to 6th order in stellar compactness (C). Based on these, we mathematically show the $O(10$

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