

Abstract Submitted
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Placing Bounds on Nuclear Matter Parameters using NICER Measurements of J0030 JOSEF ZIMMERMAN, ZACK CARSON, Department of Physics, University of Virginia, ANDREW STEINER, Department of Physics and Astronomy, University of Tennessee, Knoxville, KENT YAGI, Department of Physics, University of Virginia — The NICER telescope recently made the first direct simultaneous measurement of the mass M and radius R of the neutron star PSR J0030+0451. We utilize this measurement to place bounds on the supranuclear equation of state (EoS). We construct a population of theory-agnostic EoSs by expressing the binding energy per nucleon as a Taylor expansion in nucleon number density and isospin symmetry. By randomly sampling each of the parameters in the Taylor expansion and excluding non-physical combinations, we generate a population of 100,000 possible EoSs. By numerically solving the properties of the NS described by each EoS, we construct conditional probability distributions relating the measurable quantities M and R to the nuclear parameters such as $K_{sym,0}$ that govern the EoS. A marginalization routine is used to place bounds on the values of $K_{sym,0}$ that are consistent with measurements of J0030.

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