Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Constraining the nonanalytic terms of the nuclear symmetry energy with chiral nuclear forces. PENGSHENG WEN, JEREMY W. HOLT, Cyclotron Institute and Department of Physics and Astronomy, Texas AM University — The nuclear symmetry energy, defined as the difference between the pure neutron matter energy per particle and the symmetric nuclear matter energy per particle at a fixed density, is crucial for understanding the properties of neutron-rich nuclei and neutron stars. The expansion of the nuclear symmetry energy in even powers of the isospin asymmetry has recently been shown to breakdown in beyond-mean-field-theory calculations of the nuclear equation of state. In this talk we will describe a new finite difference method to extract the fourth- and sixth-order regular and logarithmic contributions to the nuclear symmetry energy starting from microscopic chiral two- and three-body forces. We find that in general the expansion coefficients of the nonanalytic logarithm terms are larger in magnitude than those of the corresponding regular (even-power) terms for the energy from the second-order perturbation calculation.

Pengsheng Wen
Cyclotron Institute and Department of Physics and Astronomy, Texas A
M University

Date submitted: 25 Jun 2020 Electronic form version 1.4