Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

Analysis of the ^{48}Ca neutron skin using a nonlocal dispersive-optical-model self-energy[1] MACK ATKINSON, Washington University, HOSSEIN MAHZOON, Michigan State University, WILLEM DICKHOFF, ROBERT CHARITY, Washington University — A nonlocal dispersive-optical-model (DOM) analysis of the ^{40}Ca and ^{48}Ca nuclei has been implemented. The real and imaginary potentials are constrained by fitting to elastic-scattering data, total and reaction cross sections, energy level information, particle number, and the charge densities of ^{40}Ca and ^{48}Ca, respectively. The nonlocality of these potentials permits a proper dispersive self-energy which accurately describes both positive and negative energy observables. ^{48}Ca is of particular interest because it is doubly magic and has a neutron skin due to the excess of neutrons. The DOM neutron skin radius is found to be $r_{skin} = 0.245$, which is larger than most previous calculations. The neutron skin is closely related to the symmetry energy which is a crucial part of the nuclear equation of state. The combined analysis of ^{40}Ca and ^{48}Ca energy densities provides a description of the density dependence of the symmetry energy which is compared with the ^{48}Ca neutron skin. Results for ^{208}Pb will also become available in the near future.

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Date submitted: 30 Jun 2017 Electronic form version 1.4