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Analysis of neutron skins using a nonlocal Dispersive Optical Model MACK ATKINSON, Washington University, M.H. MAHZOON, Truman State University, M.A. KEIM, W.H. DICKHOFF, R.J. CHARITY, Washington University — A nonlocal dispersive optical model (DOM) analysis of the ^{40}Ca,^{48}Ca, and ^{208}Pb 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 each nuclei. The nonlocality of these potentials permits a proper dispersive self-energy which accurately describes both positive and negative energy observables. ^{48}Ca and ^{208}Pb are of particular interest because they are doubly magic and have neutron skins due to the excess of neutrons. The DOM neutron skin radius in ^{48}Ca is found to be $r^{48}_{skin} = 0.245$, which is the largest calculated value of this skin using any method. The ^{208}Pb neutron skin is compared with the value obtained from PREX of $r^{208}_{skin} = 0.302$. 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 the nuclear energy densities provides a clear description of the symmetry energy which is then compared with the neutron skin.

Mack Atkinson
Washington University

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