

KINGDOM OF SAUDI ARABIA

Ministry of Higher Education

KING ABDULAZIZ UNIVERSITY

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Microscopic study of neutron elastic scattering from C12, Ca40, and Pb208 at intermediate energies

(2009) *Physical Review C - Nuclear Physics*, 79 (2), art. no. 024604, .

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Abstract

Recent neutron elastic scattering differential cross section data for C12, Ca40, and Pb208 at several energies from 65 to 225 MeV have been analyzed using Glauber multiple scattering model, suitably modified to enlarge angular range of validity. The center of mass and Pauli pair correlations have been considered. The effect of the phase variation of the NN scattering amplitude on the calculated cross sections has been studied. A medium modification of the elementary NN interaction is also considered. The neutron differential cross sections have been calculated using the phenomenological and the recently proposed semiphenomenological neutron and proton target densities so as to check the validity of the semiphenomenological density model. We found that our method of analysis gives a very good description of the experimental data. © 2009 The American Physical Society.

ISSN: 05562813