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Glauber method for alpha particle scattering M.A. ALVI, King Abdul Aziz University, M.A. ABDULMOMEN, J.H. MADANI, King Abdul Aziz University, R.J. PETERSON, University of Colorado, Boulder — Using the Coulomb-modified Glauber model in the optical limit approximation, we have used known distributions of nucleons in complex nuclei and a new parameterized nucleon-nucleon (N-N) phase shift function to compute elastic alpha particle scattering at beam energies from 36 to 60 MeV per nucleon, as a first example of a program for heavy ion elastic scattering analyses. At each of three energies, the three parameters of our N-N phase shift function were adjusted to fit the data for one nucleus. It was found that calculations with these same N-N parameters for other nuclei at that energy also gave good agreement with the data. This method offers good insights into the role of the N-N interaction potential within nuclei. For instance, our N-N parameters give N-N total cross sections of 74, 79, and 97% of the N-N free space total cross sections at alpha particle energies of 36, 43, and 60 MeV per nucleon. This method is readily suited to further applications to heavy ion elastic scattering, and can be expected to give useful insights into the relevant N-N interactions.

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