

## Microscopic Optical Potential Derived from $NN$ Chiral Potentials.

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A microscopic optical potential for elastic proton-nucleus scattering has been derived at the first-order term within the spectator expansion of the non-relativistic multiple-scattering theory and adopting the impulse approximation.

Two-basic ingredients are required to build the optical potential: a model for nuclear densities and the  $NN$  interaction. For the  $NN$  interaction we have used for the first time chiral potentials. Different versions of chiral potentials at fourth ( $N^3LO$ ) and fifth ( $N^4LO$ ) order have been used with the purpose to check the convergence and to assess the theoretical errors associated with the truncation of the chiral expansion in the construction of an optical potential.

Results for the cross section, analysing power, and spin rotation of elastic proton scattering from different nuclei at different proton energy, in the range between 100 and 300 MeV, are presented and compared with the available experimental data and also with the results of a phenomenological optical potential.

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