Nuclear Experiment

Analyzing power in elastic scattering of 6He from polarized proton target at 71 MeV/nucleon

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The vector analyzing power has been measured for the elastic scattering of neutron-rich 6He from polarized protons at 71 MeV/nucleon making use of a newly constructed solid polarized proton target operated in a low magnetic field and at high temperature. Two approaches based on local one-body potentials were applied to investigate the spin-orbit interaction between a proton and a 6He nucleus. An optical model analysis revealed that the spin-orbit potential for 6He is characterized by a shallow and long-ranged shape compared with the global systematics of stable nuclei. A semimicroscopic analysis with a alpha+n+n cluster folding model suggests that the interaction between a proton and the alpha core is essentially important in describing the p+6He elastic scattering. The data are also compared with fully microscopic analyses using non-local optical potentials based on nucleon-nucleon g-matrices.

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