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Microscopic Analysis of Elastic Scattering of One-Proton Halo Nucleus 17F on Different Mass Targets

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An analysis of cross sections of elastic scattering of 17F on 12C, 14N, 58Ni, and 208Pb nuclei at energy 170 MeV and on 208Pb at various energies is carried out by using the microscopic optical potentials (OPs) [1]. The proton and neutron density distributions of the exotic nucleus 17F are computed in the framework of microscopic models. The real part of the OP is calculated by a corresponding folding procedure accounting for the antisymmetrization effects, while the imaginary part is obtained on the base of the high-energy approximation [2]. In the hybrid model of the optical potential developed and explored in our previous works [3,4] the only free parameters are the depths of the real and imaginary parts of the OPs obtained by fitting the experimental data. A good agreement of the theoretical results with the available experimental data is achieved pointing out clearly to a peripheral character of the scattering.

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