Elastic scattering of the $^{7}Li + {}^{59}Co$ system

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Nuclear reactions involving weakly bound nuclei have attracted considerable interest due to the interplay among different reaction mechanisms, including elastic and inelastic scattering, nucleon transfer, fusion, and breakup. In this context, the Heavy-Ion Nuclear Reactions Group (GRIPe) at the University of São Paulo has investigated several systems involving weakly bound projectiles at energies near the Coulomb barrier [1,2].

The present work focuses on the $^{7}Li + {}^{59}Co$ system at a laboratory energy of 20 MeV, for which experimental angular distributions were measured at the Open Laboratory of Nuclear Physics and Applications (LAFNA). The elastic scattering will be analyzed within the optical-model framework through theoretical cross-section calculations and comparison with the experimental data. The nuclear interaction will be described using different nucleus-nucleus potentials, including the São Paulo Potential (SPP) and the São Paulo Potential version 2 (SPP2) [3,4].

As a subsequent stage of the project, Coupled-Channels (CC) calculations are planned to investigate the influence of couplings to inelastic states on the reaction dynamics.

Keywords: Elastic scattering; Inelastic scattering; São Paulo Potential.

Reference

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