

p-d Elastic Scattering and Breakup

A. Deltuva¹, A. C. Fonseca¹, P. U. Sauer²

¹ *Centro de Física Nuclear da Universidade de Lisboa,
P-1649-003 Lisboa, Portugal*

² *Institut für Theoretische Physik, Universität Hannover,
D-30167 Hannover, Germany*

The Coulomb interaction between the two protons is included in the calculation of proton-deuteron elastic scattering and breakup. The hadron dynamics is based on the purely nucleonic charge-dependent (CD) Bonn potential and its realistic extension CD Bonn + Δ to a coupled-channel two-baryon potential, allowing for single virtual Δ -isobar excitation. Calculations are done using integral equations in momentum space. The screening and renormalization approach is employed for including the Coulomb interaction. Convergence of the procedure is found already at moderate screening radii. The reliability of the method is demonstrated. The Coulomb effect on observables is seen at low energies for the whole kinematic regime. In proton-deuteron elastic scattering at higher energies the Coulomb effect is confined to forward scattering angles; the Δ -isobar effect found previously remains unchanged by Coulomb. The Coulomb effect on breakup observables is seen at all energies in particular kinematic regimes.