

Study of deuteron-proton elastic scattering at intermediate energies.

Nowadays, a significant amount of the experimental data in GeV energy range was accumulated both with unpolarised and polarised beams. However, a description of the data faces problems because well developed Faddeev calculation technique cannot be applied at these energies.

In this report we consider deuteron- proton elastic scattering in the relativistic multiple scattering expansion framework [1]-[3]. We start from the AGS-equations and iterate them up to second-order terms of the nucleon-nucleon t-matrix. The four reaction mechanisms are included into consideration: one-nucleon exchange, single scattering, double scattering, and the term with the Δ - excitation in the intermediate state.

The deuteron-proton elastic scattering is considered in a whole angular range at two deuteron energies, 880 MeV and 1200 MeV. The obtained theoretical predictions are compared with the existing experimental data for the differential cross section, vector A_y and tensor A_{yy} analysing powers. Effects of the different reaction mechanisms are analysed. It is shown that the inclusion of the double scattering and Δ - excitation terms into consideration significantly improves the agreement between the experimental data and theoretical predictions at the scattering angles larger than 60° .

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2. N.B.Ladygina, Phys.Atom.Nucl., 71, 2039 (2008).
3. N.B.Ladygina, Eur.Phys.J., A42, 91 (2009).

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