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Study of deuteron-proton backward elastic scattering at intermediate energies.

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We study deuteron-proton elastic scattering in the deuteron energy range between 500 MeV and 2 GeV at the cms scattering angle of 180° . The simplest reaction mechanism is one-nucleon-exchange (ONE). But the ONE-predictions are in a disagreement with the experimental data both for the differential cross section and polarization observables.

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 a second-order of the nucleon-nucleon interaction. The four reaction mechanisms are included into consideration: one-nucleon exchange, single scattering, double scattering, and the term corresponding to the delta excitation in the intermediate state.

The model is applied to describe the energy dependence of the differential cross section and polarisation observables such as tensor analyzing power T_{20} and polarization transfer from deuteron to proton $varkappa$. Contributions of the different reaction mechanisms into the reaction amplitude are demonstrated in comparison with the existing experimental data.

- [1] N.B. Ladygina, Eur.Phys.J. A52, 199 (2016).
- [2] N.B. Ladygina, Phys.Atom.Nucl. 71, 2039 (2008).
- [3] N.B. Ladygina, Eur.Phys.J.A42, 91 (2009).

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