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DIBARYON RESONANCES AND THREE-BODY FORCES IN LARGE-ANGLE PD SCATTERING AT INTERMEDIATE ENERGIES

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The large-angle proton-deuteron (*pd*) scattering at intermediate energies 200-1000 MeV is a long-standing puzzle. While the small-angle scattering can be described well by the Glauber diffraction model or, at energies $Tp < 400$ MeV, by the exact solution of Faddeev equations, the strong discrepancies between theoretical predictions and experimental data at large angles need a careful treatment of 2 N interactions and also 3 N forces.

The large-angle *pd* scattering is accompanied with high momentum transfers and thus is related to the short *NN* distances where the quark structure of the nucleon can be manifested. While the accurate incorporation of the quark and gluon degrees of freedom in hadronic processes at intermediate energies is a very complicated and non-trivial task, the quark structure of the nucleon in the short-range *NN* interaction can be effectively treated by means of 6 q bags dressed by meson clouds (the dressed dibaryons). The dibaryon model for the *NN* interaction was proposed by the Moscow-Tuebingen group twenty years ago, but only recently found new experimental confirmation in *NN* elastic scattering and *NN*-induced meson production. The model has been updated to include inelastic processes and new experimental data and proved to be an adequate tool for describing both elastic and inelasctic *NN* scattering in the basic S, P, and D partial waves in a wide energy range from zero to about 1 GeV [1]. The dibaryon mechanism of the short-range *NN* interaction leads to the emergence of new three-body forces acting between the dibaryon and the third nucleon, which can give a significant contribution to the large-angle *pd* scattering.

In the talk, we present the preliminary calculation of the pd elastic cross section and some spin observables using the phenomenological model, which combines the basic traditional mechanisms such as one-nucleon exchange and the Δ-isobar excitation with the new dibaryon-induced mechanisms. We extensively use the results obtained in a model [2] for the $pp \longrightarrow d\pi+$ reaction and the dibaryon parameters found experimentally. We show the important role of the known isovector dibaryons in description of the cross section and spin observables of large-angle pd scattering. This result seems to be promising in resolving the long-standing puzzles in *pd* scattering and, more generally, in the processes involving few-nucleon systems and high momentum transfers.

1. V.I. Kukulin et al., Phys. Lett. B **801**, 135146 (2020).
2. M.N. Platonova and V.I. Kukulin, Phys. Rev. D **94**, 054039 (2016).

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