

RECENT PROGRESS IN DESCRIPTION OF NN SCATTERING WITH THE DIBARYON MODEL

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We review the recent results obtained within the dibaryon model for NN interaction [1-4]. The model takes into account the formation of the intermediate six-quark (dibaryon) state in each partial wave. The respective mechanism leads to an energy-dependent term in the interaction which reflects the coupling with the internal non-nucleonic channel.

The substantial progress in the description of elastic and inelastic NN scattering in different partial channels has been achieved by taking into consideration the parameters of the dibaryon resonances found from experiments and partial wave analyses (PWA). As an illustration, elastic and inelastic NN scattering amplitudes for all the lowest partial configurations with the total angular momentum up to $J = 3$ are presented in comparison with the NN PWA data in a broad energy range from zero to $T_p = 0.7-1.2$ GeV. Simultaneously, the model gives the dibaryon resonance parameters very close to the experimental ones for the NN channels where the respective data exist and predicts new resonances in the NN channels $3P_1$, $1P_1$, $3D_2$ and $1F_3$, where dibaryon states have not been detected to date.

Important inelastic processes such as pion production in NN scattering can also be described within the model [3,4]. The recent results for pion production with account of particular dibaryon resonances are discussed as well.

1. V.I. Kukulin et al., Phys. Lett. B 801, 135146 (2020).
2. V.I. Kukulin et al., Eur. Phys. J. A 56, 229 (2020).
3. O.A. Rubtsova, V.I. Kukulin, and M.N. Platonova, Phys. Rev. D 102, 114040 (2020).
4. M.N. Platonova and V.I. Kukulin, Phys. Rev. D 103, 114025 (2021).

The speaker is a student or young scientist

No

Section

1. Nuclear structure: theory and experiment

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