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The Kharkov potential in the theory of 2N- and 3N-systems with solving the relativistic Faddeev equations

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We have extended applications [1] of unitary clothing transformations (UCTs) [2,3] in quantum field theory. Such transformations connect the representation of "bare"particles (BPR) and the representation of "clothed" particles (CPR), i.e., the particles with physical properties. The Kharkov potential is a recent field theoretical model of nucleon-nucleon (NN) interaction that has built up in the framework of the instant form of relativistic dynamics starting with the total Hamiltonian of interacting meson and nucleon fields in the CPR. Unlike many available NN potentials each of which is the kernel of the corresponding nonrelativistic Lippmann-Schwinger (LS) equation this potential being dependent in momentum space on the Feynman-like propagators and covariant cutoff factors at the meson-nucleon vertices is the kernel of relativistic integral equations for the NN bound and scattering states. As in Ref. [4] we have employed a transition from the relativistic Lippmann-Schwinger (LS) equation for the two-body t-matrices to the so-called boosted LS one. The theoretical predictions based on the Kharkov and CDBonn potentials are compared to recent precise data for the analyzing powers iT_{11}, T_{20}, T_{21} and T_{22} in the pd scattering. Special attention has paid to finding from the contemporary n-p phase shift analysis [5] reliable optimum values of the adjustable parameters involved in the covariant meson-nucleon cutoff functions in momentum space.

REFERENCERS

[1] H.Kamada, A.Shebeko, A.Arslanaliev, H.Witala, J.Golak, R.Skibinski, M.Stepanova. In: Recent Progress in Few-Body Physics, eds. N.Orr, M.Ploszajczak, F.Marques, J.Carbonell, Springer (2020).
[2] I.Dubovyk, A.Shebeko, Few-Body Syst. 48 (2010) 109.
[3] A.Shebeko, Chapter I in: Advances in Quantum Field Theory, ed. S.Ketov Intech (2012).
[4] H.Kamada, A.Shebeko, A.Arslanaliev, Few-Body Syst. 58 (2017) 70.
[5] F.Gross, A.Stadler, Phys. Rev. C\textbf{78} (2008) 014005.

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