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Tensor correlations in light nuclei

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Tensor correlations play an important role in a nuclear system. A realistic interaction, which reproduces the nucleon-nucleon scattering, implies short-range repulsion and strong tensor components. In this contribution, we investigate the structure of the tensor correlations in light nuclei. We obtain highly correlated many-body states with an explicitly correlated basis which enables us to get a precise solution of a many-body Schroedinger equation for the realistic interaction. The energy levels of 4He below 26 MeV are reproduced very well without any model assumption. We show two-body density distributions in different spin-isospin channels for two- to four-nucleon systems and find universal behaviors at short distances and high momenta. The effect of three-body correlations due to the tensor force on the two-body densities is discussed.

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