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Comparison of the JISP16 and the AV18 forces based predictions for the differential cross section and the nucleon analyzing power in d(n, nn)p reaction

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The JISP16 nucleon-nucleon potential [1] is applied to investigate the nucleon induced deuteron breakup reaction at energies E=13 and 65 MeV. We use the formalism of Faddeev equation [2] and proceed like in the case of the application of the JISP16 potential to the elastic scattering process [3].

Our study reveals that this force delivers, in general, qualitatively a similar description of the exclusive cross-section and analyzing power for the studied reaction to the one based on the standard realistic nucleon-nucleon AV18 interaction [4]. However, in some regions of the phase space, the differential cross sections based on the JISP16 and on the AV18 forces differ by more than 100% and 50% at E=13 and E=65 MeV, respectively. In the case of analyzing power – there is a difference of more than 100% at E=65 MeV. Such specific parts of the phase space can be used to fine-tune the JISP16 potential parameters.

References list:

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