

STUDY OF GROUND STATES OF $^{6,7,9,11}\text{Li}$ NUCLEI BY FEYNMAN'S CONTINUAL INTEGRALS METHOD

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The wave functions of the ground states of few-body nuclei $^{6,7,9,11}\text{Li}$ are calculated by Feynman's continual integrals method in Euclidean time [1–3]. The algorithm of parallel calculations was implemented in C++ programming language using NVIDIA CUDA technology [4]. Calculations were performed on the NVIDIA Tesla K40 accelerator installed within the heterogeneous cluster of the Laboratory of Information Technologies, Joint Institute for Nuclear Research, Dubna.

The studied isotopes are considered as cluster nuclei with the following configurations: ^6Li ($\alpha+n+p$), ^7Li ($\alpha+n+n+p$) ^9Li ($^7\text{Li}+n+n$), and ^{11}Li ($^9\text{Li}+n+n$). The probability density distribution for ^6Li ($\alpha+n+p$) nucleus in the Jacobi coordinates with the vectors \vec{x} , \vec{y} , and the angle θ between them is shown in Fig. 1.

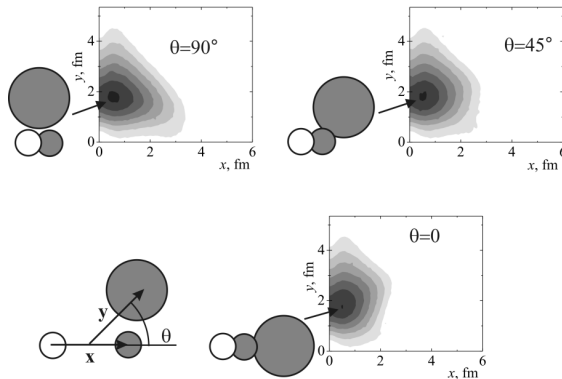


Fig. 1. The probability density for the ^6Li nucleus and the vectors in the Jacobi coordinates; neutrons and α -clusters are denoted as small empty circles and large filled circles, respectively, protons are denoted as small filled circles. The only one possible configuration is α -cluster + deuteron-cluster.

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