MONTE-CARLO EVENT GENERATOR FOR DECAYS AND DIRECT REACTIONS

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The interest of the dripline studies is naturally shifting to the side of particle-unstable systems. Due to pairing interaction practically half of the dripline systems demonstrates dynamics forms which can be understood as three-body phenomena. Complicated correlation data are obtained in the modern experiments where nuclear reactions and decays with three fragments in final state are emitted. This information can provide important insight into the structure and reaction mechanism. However, ability to extract this information is hindered by distortions introduced by experimental setup. To overcome this difficulty the results of theoretical estimations made for three-body correlations in the final state should be used in Monte Carlo simulations taking into account peculiarities of the measuring apparatus.

The need for fully quantum mechanical Monte Carlo event generator for three-body reactions was first realized in 2005 while studying the population of ^{5}H states [1]. Since that time considerable developments were undertaken within research projects financed by FAIR-Russia Research Center. Nowadays the Three-body Event Generator for Decays and Direct Reactions (TEG-DDR) is a sufficiently mature software package. The functionality of this tool has been proven in data treatment made for several experiments performed at GSI [2,3], at JINR [4,5], and at MSU [6,7].

The present problem concerns data analysis of ^{10}He experiment [8] which revealed the unusual order of population of ^{10}He excited states. The usage of TEG-DDR will enable to describe this peculiarity of the ^{10}He spectrum. The work is carried out with the financial support of FRRC.

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