

Diffuseness of nucleon density distribution and double-folding nucleus-nucleus potential

Thursday, 14 July 2022 16:00 (20 minutes)

Description of the internuclear interaction is the one of the most important tasks in analysis of various nuclear reactions. In particular, the position and height of the barrier determined by Coulomb and nuclear interactions should be estimated in order to evaluate general properties of fusion of heavy nuclei.

The calculations of fusion barriers are carried out within the double-folding approach assuming the diabatic regime of collisions of heavy ions with $Z, N > 9$. Nucleon density distributions are required to calculate the double-folding potential [1, 2]. Thus, radial parameters of nucleon densities given in the Fermi-distribution form are approximated on the basis of *rms* charge radii [3]. According to experimental data [4], diffuseness parameters of nucleon distributions are not clearly correlated with Z, N, A of corresponding nucleus and have significant uncertainties. Therefore, the diffuseness values were fitted to reproduce the Bass barriers [5] for spherical nuclei (fig. 1). Potential barriers obtained in such a way can be used as estimation of fusion barriers in heavy ion reactions.

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Section

1. Experimental and theoretical studies of nuclear reactions

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Session Classification: Experimental and theoretical studies of nuclear reactions