

Double-folding nucleus–nucleus interaction potential based on the self-consistent calculations

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The nucleon density profiles of spherical nuclei are calculated within the self-consistent HFB approach based on the non-covariant energy density functional. For the reactions with light nuclei, the nucleus–nucleus interaction potentials are calculated in the double-folding form with these nucleon densities. The characteristics of the Coulomb barriers obtained are in good agreement with those required to describe the sub-barrier complete fusion. The energy density functional used provides a reliable basis to calculate the nucleus–nucleus potential in the reactions of astrophysical interest. A simple parametrization for the nuclear part of the nucleus–nucleus interaction is proposed to estimate the height, position, and curvature of the Coulomb barrier.

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