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A Brief Note on Stored Energy and Nuclues Compound

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Description

Potential motivation is a vital element in both static and dynamical analyses of the nuclear fission process. The calculation of surface, nuclear, coulomb, rotational, curvature, congruence, and Wigner energy functionals for a wide range of nuclear forms produced by a parametrization (c,h,α). These functionals can be used to compute the potential energy in a variety of macroscopic liquid-drop simulations. All of these quantities can be calculated using a numerical code.

The parametrization describes the shape of the fissioning nucleus. The axially symmetric shapes in cylindrical coordinates are determined by this parametrization (c,h,α). The potential energy functionals are derived as a function of the three shape parameters using a numerical integration approach. In four multiple variations of the liquid-drop model, these functionals can be used to create nucleus potential energy. The code that calculates the potential energy functionals is isolated from the subroutines that specify the nuclear form.

As a result, acquired the shape parametrization is specified in cylindrical coordinates, the application can easily be used for any other shape parametrization.

Many computational methods on nuclear fission have been undertaken in recent decades. The substantial rearrangement of the initial complex nucleus, which separates into two or more halves, is a key aspect of the fission process. Fission models based on nucleus level densities at the ground and transition states were established. The fission saddle or scission point can be taken to be the transition state. In the meanwhile, several variations of the transition-state model have arisen.

The code utilised of collective nuclear dynamics published in the papers is presented in this document. The code calculates the potential energy in a variety of macroscopic liquid-drop instances. The potential energy of the compound nucleus is computed as a function of the three shape parameters, which determine how the compound nucleus shape can change during its evolution from ground state to scission into fission fragments. The work contains the first part of the computer code that was used in our group to model the fission process using the multi-dimensional Langevin approach, with some details modified for future challenges. The paper and computer code shows how to determine the potential energy of the compound nucleus using several liquid-drop models. The programme calculates deformation-dependent potential energy functionals as well as potential energy, which is a significant aspect of macroscopic–microscopic nuclear fission models. The axially symmetric shapes given in cylindrical coordinates by the parametrization define the nuclear shape. The profile function, whose rotation around the symmetry axis determines the nuclear surface, can be used to characterise an axially symmetric nuclear shape in cylindrical coordinates. There are numerous nuclear shape parametrizations that can be used to describe the form of a fashioning compound nucleus. One of these parametrizations is the (c,h,α) parametrization, which generates a three-parametric form family. For static calculations, this parametrization was involved. Regardless of which category of description (transition-state or dynamical evolution) is used, the fission process is the potential energy of the compound nucleus. The position of the transition states, the fission barrier height, and the kinetics of the fission process are all determined by the potential energy. As an out-turn, precise potential energy computation is essential for the theoretical interpretation of experimental results.

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