On isotopic structure of fission fragments*

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Spontaneous fission of ^{252}Cf and fusion-induced fission of ^{250}Cf are investigated within a multidimensional Langevin model. The potential-energy surface is calculated in the macroscopic-microscopic method using the Lublin-Strasbourg Drop (LSD) [1] and the ISO-scalar Liquid Drop Approximation (ISOLDA) [2] to evaluate the macroscopic part of the energy. The microscopic energy correction is obtained using the BCS and Strutinsky formalism [3] and the Yukawa-Folded (YF) single particle levels. The four-dimensional (4D) Fourier-over-Spheroid (FoS) parametrization [4,5] was used to describe the shape of the fissioning nucleus. The dynamical evolution represented by the Langevin equation is coupled to neutron evaporation [6], thereby allowing for the possibility of multichance fission. Charge equilibration and excitation-energy sharing between the fragments emerging at scission are evaluated, and their deexcitation is finally computed. The correlation between various observables, particularly the isotopic properties of the fragments, is discussed and compared with the experiment whenever available. The theoretical predictions are generally in good agreement with the data [7-9].

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