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[P03] Estimation of fission fragment yields using random-walk models on microscopic mean-field potentials

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Microscopic calculation is one of the effective approaches to complement nuclear data due to its prediction power, firmly based on knowledge of the nuclear physics. To estimate the fission fragment yields (FFY), we suggest a theoretical model composed of the Metropolis random-walk method and microscopic calculations in which the potential energy surface (PES) is deduced from the mean-field model in terms of the Skyrme Hartree-Fock + BCS model represented in the three-dimensional Cartesian coordinate space. The random-walks on the PES correspond to the shape evolution during the fission process in our model. The PES is calculated considering the quadrupole and octupole deformations as constraints which are important for nuclear elongation and mass asymmetric fission. In this work, we apply three different Skyrme effective interactions to calculate the PES and different energy-dependent random-walks, and show how the FFY depends on these different choices of computational methods. Then, we discuss the peak shapes of FFY through the comparison among our calculations and experimental data.

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