Time-dependent microscopic theory of ^{240}Pu induced fission[1]

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We present fully microscopic dynamical calculations of low-energy ^{240}Pu fission. In this approach, a quantum-mechanical wave packet is constructed from constrained Hartree-Fock Bogoliubov solutions and evolved as a function of time from the first well to scission, using the Time-Dependent Generator Coordinate Method (TDGCM). The TDGCM provides a fully self-consistent framework to treat both the dynamic and static aspects of fission, as well as the interplay between single-particle and collective degrees of freedom which are central to the fission process. The only phenomenological input to the method is the effective interaction between the nucleons. The time evolution of the wave packet toward scission will be presented, and the calculation of fission-fragment properties (yields, kinetic and excitation energies, etc.) will be discussed.

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