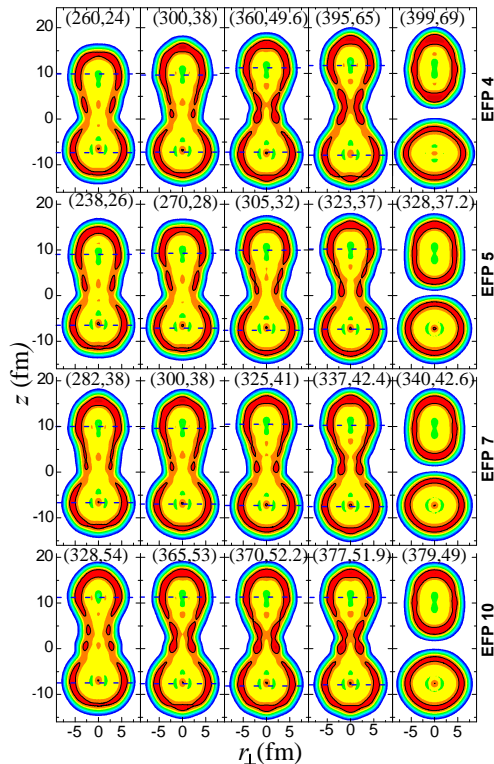# Computation of fragments in the spontaneous fission of ^{240}Pu

Objectives

- Fission is a fundamental decay mode of heavy atomic nuclei. One of the important observables characterizing fission is the charge and mass distribution of fission fragments.

- We use nuclear density functional theory and the stochastic Langevin framework to simulate the fission process.

Neutron localization functions for several configurations of ^{240}Pu along the four fission pathways.

Impact

- We reproduce the measured charge and mass distribution of fission fragments of ^{240}Pu.

- We find that non-Newtonian Langevin trajectories produce the tails of the fission fragment distribution.

- The prefragments deduced from nucleon localizations are formed early and change little as the nucleus evolves towards scission.

- Our work shows that only theoretical models of fission that incorporate some form of stochastic dynamics can give an accurate description of the structure of fragment distributions.

Accomplishments

- Publication: J. Sadhukhan, Ch. Zhang, W. Nazarewicz, and N. Schunck, Phys. Rev. C 96, 061301(R) (2017)