

A basis for scission dynamics

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We propose a framework to calculate the dynamics at the scission point of nuclear fission based as far as possible on a discrete representation of orthogonal many-body configurations. Assuming axially symmetric scission shapes we use the K orbital quantum number to build a basis of wave functions. In this first exploratory study, we examine how close to the scission point configurations exist that are eigenstates of self-consistent mean-field Hamiltonians, and thus stable against decay. These configurations, which we call cliff states, connect to configurations which we call gliders, that fission into fragments purely by mean-field dynamics.

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