

Abstract Submitted
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Excitation energy dependence of fission fragment yield curves

JOHN LESTONE, Los Alamos Natl Lab — It is well known that fission yield curves depend on excitation energy. For low-energy fission of actinides the yield curves are asymmetric with the heavy mass peak centered near $A \sim 140$. At many tens of MeV of excitation energy the yield curves become symmetric. For some applied applications the small yield-curve changes associated with moving from thermal-neutron induced fission to fast-neutron induced fission are of great importance. An analysis of the small changes in the $^{238}\text{U}(n,f)$ yield curves at inducing neutron energies of 2 and 5.5 MeV, and the differences between the ^{240}Pu spontaneous fission and $^{239}\text{Pu}(n_{\text{th}},f)$ yield curves suggest that the yield curves are not determined by the nuclear potential energy surface near the fission saddle point, but instead defined by the nuclear potential energy surface at large deformation close to the scission configuration. The widths of the mass peaks in the low-energy fission of actinides appear to be due to Langevin-driven shape fluctuations in a heat bath with a temperature of ~ 0.8 MeV.

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