Abstract Submitted
for the DNP06 Meeting of
The American Physical Society

Theoretical Description of the Fission Process[1] WITOLD NAZAREWICZ, University of Tennessee/ORNL — Spontaneous fission is one the oldest decay modes known, but is still not fully understood. On the one hand, various nuclear structure models have been applied to fission barriers, lifetimes, and mass/charge distributions, and they provide a good overall description of the phenomenon and, in many cases, detailed predictions. On the other hand, the full-fledged, non-adiabatic description of fission, based on effective nucleon-nucleon interactions, still does not exist. The aim of our project on "Theoretical Description of the Fission Process," supported by NNSA (www.phys.utk.edu/witek/fission/fission.html), is to attack the problem of spontaneous fission using modern theoretical methods and state-of-the-art computational tools. During the first stage of the project, we have studied static fission barriers of the even-even actinide and transactinide nuclei within the self-consistent Density Functional Theory. The computations are carried out applying a code that makes it possible to break all self-consistent symmetries of the nuclear mean field, including axial symmetry and reflection symmetry. Particular attention has been paid to symmetry-breaking effects along the fission path.

Witold Nazarewicz
University of Tennessee/ORNL

Date submitted: 20 Jun 2006   Electronic form version 1.4