Nuclear fission problem and Langevin equation

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Abstract
A combined dynamical and statistical model for fission was employed in our calculation. There is no doubt that a Langevin description plus a Monte Carlo treatment of the evaporation processes provide the most adequate dynamical description. In this paper, we would consider a strongly shaped dependent friction force and we use the numerical method rather than the analytical one. The objective of this article is to calculate the time dependent fission widths of the $^{224}_{\text{Th}}$ nucleus. The fission widths were calculated with both chaos-weighted wall friction (CWWF) and wall friction (WF) dissipations. The calculations are repeated for 100000 trajectories. The result was compared to the others’ work. We use nuclear elongation coordinate with time and it is necessary to repeat the small steps many times to improve the accuracy.

Keywords: fission, Langevin equation, chaos-weighted wall friction, wall friction

For full article, refer to the Persian section