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Theoritical analysis of the fission process by ^{258}Md

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It has been shown that fission has multiple modes, characterized by mass asymmetric fission and mass symmetric fission[1]. In neutron-rich heavy element region,it is argued that several fission modes coexist, with a significant change of their yields in accordance with the number of neutrons contained in the fissionig nucleus. A typical example is found in the isotope dependence of fission for fermium isotopes.
For Fm, the dominant mode transitions from the asymmetric splitting for ^{257}Fm to the symmetric for ^{258}Fm[2]. This transitions was interpreted as due to the lowering of the fission barrier for symmetric fission, and the becoming energy advantage fission path of symmetric fission then asymmetric fission.
It's important to know of the potential energy surface structure and nuclear's deformation process to understand fission mechanism in neutron-rich heavy element region[3].
^{258}Md, which is the target of this work, is located near the boundary line where the transition from mass asymmetric fission to mass symmetric fission is expected to occur, and in recent years, the Japan Atomic Energy Agency has obtained the world's first fission data. As a result of data analysis, it shown that the mode of mass symmetric fission (superlong-mode) and the mode of asymmetric fission (standard-mode) coexist.
In this work, we compared the calculation using the fluctuation dissipation model(Langevin calculation)[4] with the experimental data, and considered the characteristics of the fission mode shown by the experimental data.

Reference
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