



Microscopic Models of Fission Dynamics

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The process of spontaneous or induced fission presents an example of large-amplitude collective motion in self-bound mesoscopic systems, exhibiting an interplay between classical and quantum effects. A wealth of experimental results has been accumulated, and a basic understanding of fission mechanism gained. In recent years, major progress has been achieved in the development of time-dependent microscopic approaches that offer a more comprehensive and predictive description of the fission process. These advances encompass the calculation of fission fragment yields [1], the characterization of energy dissipation mechanisms and total kinetic energy distributions [2,3], the study of neck formation and rupture dynamics [4], the treatment of quantum fluctuations and symmetry restoration [5], the microscopic origin of fragment angular momentum, and the analysis of quantum entanglement between the emerging fragments [6].

References

- [1] Z. X. Ren, J. Zhao, D. Vretenar, T. Nikšić, P. W. Zhao, and J. Meng, *Phys. Rev. C* **105**, 044313 (2022).
- [2] J. Zhao, T. Nikšić, and D. Vretenar, *Phys. Rev.* **105**, 054604 (2022), *Phys. Rev. C* **106**, 054609 (2022).
- [3] B. Li *et al.*, *Phys. Rev. C* **107**, 014303 (2023).
- [4] Z. X. Ren *et al.*, *Phys. Rev. Lett.* **128**, 172501 (2022).
- [5] B. Li *et al.*, *Phys. Rev. C* **108**, 014321 (2023), *Phys. Rev. C* **111**, L051302 (2025).
- [6] B. Li *et al.*, *Rev. C* **110**, 034302 (2024).