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Exploring nuclear dissipation properties at large deformations

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Currently, a survey of dissipation properties in fission has attracted a wide attention [1,2]. While the presaddle dissipation [3,4] has been well determined by confronting theoretical predictions with measured data, few studies are devoted to strongly constraining the strength of postsaddle dissipation. Because the deformation dependence of the nuclear dissipation is a key input for applying stochastic approaches to describe fission data of excited nuclei, how to accurately get information of dissipation at large deformations become very urgent. Based on the Langevin model, we calculate the evolution of postsaddle particle multiplicities of heavy ^{240}Am nuclei with the postsaddle dissipation strength. It is found that the sensitivity of these particles to the postsaddle dissipation strength is significantly enhanced at high excitation energy and high angular momentum. Moreover, we compare the postsaddle emission as a function of the postsaddle dissipation strength under the conditions of (high excitation energy, low angular momentum) and (low excitation energy, high angular momentum). It is shown that the former type of conditions not only significantly enhances the influence of dissipation on particle evaporation but also substantially increases the sensitivity of light charged particles to the postsaddle dissipation strength. These findings suggest that on the experimental side, to precisely probe the postsaddle dissipation strength by measuring particle emission, in particular with light charged particles, heavy-ion collisions at intermediate energies could be an optimal way to yield highly excited heavy fissioning nuclei [5]. In a recent work, we discuss the important effect of backstreaming on probing postsaddle dissipation with light multiplicity [6].

Reference

[1] K. H. Schmidt et al., Rep. Prog. Phys. 81, 106301 (2018).

[2] A. N. Andreyev et al., Rep. Prog. Phys. 81, 016301 (2018).

[3] J. Tian, N. Wang and W. Ye, Phys. Rev. C 95, 041601 (2017)(R).

[4] N. Wang and W. Ye, Phys. Rev. C 97, 014603 (2018).

[5] N. Wang and W. Ye, Phys. Rev. C 98, 034614 (2018).

[6] N. Wang and W. Ye, submitted for publication.

Abstract Type

Talk

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