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Large-amplitude quadrupole shape mixing probed by the (p, p') reaction

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To discuss a possible observation of large-amplitude nuclear shape mixing by nuclear reaction, we employ a simple collective model and evaluate transition densities, with which the differential cross sections are obtained through the microscopic coupled-channel calculation [1]. Assuming the spherical-to-prolate shape transition, we focus on large-amplitude shape mixing associated with the softness of the collective potential in the beta direction. We introduce a simple model based on the five-dimensional quadrupole collective Hamiltonian, which simulates a chain of isotopes that exhibit spherical-to-prolate shape phase transition. Taking ^{154}Sm as an example and controlling the model parameters, we study how the large-amplitude shape mixing affects the elastic and inelastic proton scatterings. In this talk, I will also touch on future perspective on microscopic calculation based on the local QRPA method.

[1] K. Sato, T. Furumoto, Y. Kikuchi, K. Ogata, Y. Sakuragi, arXiv:1904.07398.

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* The talk will be given in English language.

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