

Investigation of shape coexistence and β -softness in the neutron rich $A \approx 100$ region using lifetime measurements

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The $A \approx 100$ region is an interesting region of the nuclear chart with the occurrence of different nuclear structure phenomena. For example, the well known sudden onset of collectivity in the neutron-rich Sr and Zr isotopes [1, 2], the multiple shape coexistence in the neutron-rich stable Cd isotopes [3, 4] or the evidences for β -softness in the Mo, Ru and Pd isotopes. Lifetimes of excited states in ^{102}Mo and $^{104,106}\text{Ru}$ were measured using the $(^{18}\text{O}, ^{16}\text{O})$ two neutron transfer reaction in combination with the Plunger device at the Cologne FN Tandem accelerator [5–7]. In this reaction, a low amount of momentum and energy is transferred, making it a powerful tool for the investigation of nuclear structures dominating at low energies. This allows a detailed analysis of the shape coexistence phenomena in the Mo isotopes occurring at the transition from $\beta = 58$ to $\beta = 60$ [6] and the nuclear structure related to the β -deformation in neutron-rich Mo and Ru isotopes [6, 7]. The results were compared to different nuclear structure models like the interacting boson model (IBM), the Jean-Wilets β -soft model and the Davydov-Filippov rigid triaxial rotor model depending on the case.

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