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Investigation of shape coexistence and □-softness in the neutron rich A≈100 region using lifetime measurements

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The A≈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 □-softness in the Mo, Ru and Pd isotopes. Lifetimes of excited states in 102 Mo and 104,106 Ru were measured using the (18 O, 16 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 □ = 58 to □ = 60 [6] and the nuclear structure related to the □-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 □-soft model and the Davydov-Filippov rigid triaxial rotor model depending on the case.

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