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

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The $A \approx 100$ region is a diverse 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 γ -softness in the Mo, Ru and Pd isotopes. Lifetimes of excited states in ^{98}Zr , ^{102}Mo and ^{112}Pd were measured using the (^{18}O , ^{16}O) two neutron transfer reaction in combination with the Plunger device at the Cologne FN Tandem accelerator [5,9]. 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 Zr and Mo isotopes occurring at the transition from $N = 58$ to $N = 60$ [6,8] and the nuclear structure related to the γ -deformation in neutron-rich Mo and Pd isotopes [7,8]. The latter were compared to the interacting boson model (IBM), the Jean-Wilets γ -soft model and the Davydov-Filippov rigid triaxial rotor model.

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