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Shape coexistence in neutron-rich Sr and Kr isotopes: Prompt spectroscopy after Coulomb excitation at REX-ISOLDE, CERN and after neutron induced fission of ^{235}U at ILL

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A rapid onset of quadrupole deformation is known to occur around the neutron number 60 in the neutron-rich Zr and Sr isotopes. This shape change has made the neutron-rich A = 100 region an active area of experimental and theoretical studies for many decades now. The nuclei here are one of the best examples of the interplay between single-particle and collective modes of excitation leading to spectacular shape change and shape coexistence scenario. In such regions, large variations of the observed spectroscopic properties at a particular proton or neutron number make the theoretical interpretation particularly challenging.

Rapid changes in deformation were first derived from prompt γ-ray spectroscopy and lifetime measurements of fission fragments as early as 1970 [1]. However, in the recent years, modern RIB facilities have brought new insights in this topic. Laser spectroscopy, mass measurement studies of the ground states of the Kr, Sr and Zr isotopes and safe Coulomb excitation measurement of the N=60 ^{96}Kr have been recently performed at ISOLDE-CERN. These new data have defined the low Z boundary of the phenomena pointing a specific proton-neutron interaction stabilizing the nuclei thanks to large deformation [2,3,4,5]. The comparison of the known experimental data with a particular emphasis on the observed spectroscopic properties shows large discrepancies in the transitional region for either mean-field or shell-model like formalism, supporting the need for more spectroscopic information's.

In this contribution, preliminary results on measured spectroscopic quadrupole moments and B(E2) in ^{96,98}Sr isotopes, obtained after safe Coulomb excitation of a post-accelerated RIB delivered by the REX-ISOLDE facility at CERN, will be presented [6,7]. In addition a brief presentation of the recent data collected in the neutron Kr isotopes around N=60 populated by neutron induced fission of ^{235}U at the ILL during the EXOGAM (EXILL) campaign will be shown.

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