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Deformation Around $A=70$ through the proton drip-line

Nuclei in the vicinity of the $N=Z$ line around $A=70$ through the proton drip-line exhibit very rapid shape changes due to the isospin symmetry breaking related to charge effects. This leads to differences in excitation energy between analogue states in isobaric multiplets. We have performed a Coulomb excitation experiment of ^{70}Kr in order to measure the $B(E2; 0^+ \rightarrow 2^+)$ value for the first time. The experiment was performed at the Radioactive Isotope Beam Factory (RIBF). The ^{78}Kr primary beam at 345 MeV/nucleon was impinging on ^9Be target. The BigRIPS fragment separator was used in order to deliver the ^{70}Kr and isotopes at around 150 MeV/nucleon to the secondary target for Coulomb excitation and inelastic scattering measurements. The emitted gamma-rays of the reaction were detected by DALI2 array and recoils were identified by the ZeroDegree Spectrometer. Results will allow to make a direct comparison with the mirror nucleus ^{70}Se and will give an important new information about shape co-existence across the $N=Z$ line. The chain for the experimental knowledge on Kr isotopes was extended with this study and compared it with theoretical calculations. Results also allow to make a direct comparison with ^{70}Se which gives important new information about the shape coexistence phenomenon, the existence of two stable shapes at the same excitation energies, across the $N=Z$ line. Additionally, the mirror energy differences of $T_z=1$ isobaric analogue states for ^{70}Kr with respect to its mirror ^{70}Se and triple energy differences of the multiplet were probed by including the ^{70}Br isotope in the analysis.

Primary author: ARICI, Tugba (GSI, Darmstadt)

Co-authors: GERL, Jürgen (GSI, Darmstadt); Dr WIMMER, Kathrin (Central Michigan University); Dr DOORNENBAL, Pieter (RIKEN); Prof. KORTEN, Wolfram (CEA)