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Isomeric decay spectroscopy of 96Cd

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Self-conjugate nuclei, where $N = Z$, exhibit a strong pn interaction due to the large overlap of wavefunctions in identical orbitals. The heaviest $N = Z$ nuclei studied so far is ^{92}Pd, and it has demonstrated a strong binding in the $T = 0$ interaction [1]. As the mass number increases, the nucleus approaches the doubly-magic ^{100}Sn. To investigate the evolution of the pn interaction strength near the shell closure $N = Z = 50$, experimental results on the next self-conjugate, even-even nucleus ^{96}Cd are needed.

Record quantities of ^{96}Cd were produced at RIKEN Radioactive Isotope Beam Factory, via fragmentation of an intense ^{124}Xe beam on a thin ^{9}Be target. Their decay products were measured with EURICA, consisting of HPGe/$LaBr_3$ detectors for gamma-rays, and WAS3ABI, a set of position-sensitive silicon detectors for positrons, protons and ions. A high-spin isomeric state in ^{96}Cd was found, along with gamma-ray transitions that populate both the ground state and the 16^+ spin-trap isomeric state. Isomer half-lives and the proposed experimental level scheme of ^{96}Cd will be presented, followed by a discussion of its pn interaction strength and the decay to ^{96}Ag.

Primary author: PARK, Jason (University of British Columbia/TRIUMF)

Co-authors: Dr LEWITOWICZ, Marek (GANIL); Prof. KRUECKEN, Reiner (TRIUMF); Dr GERNHAEUSER, Roman (TU Munich); Dr NISHIMURA, Shunji (RIKEN)

Presenter: PARK, Jason (University of British Columbia/TRIUMF)

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