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Half-life measurements of nuclei around the doubly-magic 100Sn

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^{100}Sn is the heaviest self-conjugate doubly magic nuclei with $N = Z = 50$. Research on this nucleus has been aggressively pursued, for its properties yield valuable information on many topics of nuclear physics: the robustness of the magic number 50 far from stability, the effect of proton-neutron interaction, and the location of the proton dripline and the end of the rapid proton-capture process path, to name a few. Due to the lack of experimental information on the structure of ^{100}Sn itself, the properties of ^{100}Sn have to be inferred from spectroscopy results of the neighbouring isotopes. As one of the experimental observables, half-life measurements of these radioactive nuclei reflect their general stability, while enabling the calculation of transition strengths for decay matrix elements. These results serve as benchmark tests against modern shell model calculations and inputs for astrophysical rapid proton-capture models of nucleosynthesis.

Record quantities of $N \sim Z \leq 50$ nuclei 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 high-purity germanium detectors for γ rays, and WAS3ABi, a set of position-sensitive silicon detectors for positrons and protons. Half-lives of exotic ^{91}Pd, ^{95}Cd, ^{97}In, and ^{99}Sn isotopes were measured for the first time, and higher precision in half-lives of several isotopes in the vicinity of ^{100}Sn was achieved. A systematic study of the measured half-lives will be presented, probing the robustness of the magic number 50 in nuclei near the proton dripline.

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