

Core-breaking effects approaching ^{100}Sn : lifetime measurements in $^{98,100}\text{Cd}$

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The nuclear structure of doubly magic nuclei such as ^{100}Sn and its neighboring isotopes is of significant interest due to the valuable insights it offers for testing the nuclear shell model. However, describing the nearby Cd isotopic chain poses additional challenges due to the enhanced correlations induced by two proton holes in the $g_{9/2}$ orbit. In particular, ^{98}Cd ($Z=48$, $N=50$) stands out as the most proton-rich $N=50$ isotone for which information about excited states is available, while data on lifetimes remain scarce.

An experimental study with the aim of measuring the lifetimes of low-lying excited states below the 8^+ seniority isomer in the neutron-deficient $^{98,100}\text{Cd}$ isotopes was performed at GSI-FAIR as part of the FAIR Phase-0 program. Ions of interest were populated via a relativistic fragmentation reaction induced by an 839-MeV ^{124}Xe beam. The nuclei were then selected and identified using the FRagment Separator (FRS) and subsequently implanted in the DEcay SPECTroscopy (DESPEC) station. The lifetime measurements were conducted using the FATIMA $\text{LaBr}_3(\text{Ce})$ array employing the Generalised Centroid Difference (GCD) method.

The obtained results will be discussed and compared with shell model calculations, employing various model spaces and interactions. These comparisons reveal that while ^{98}Cd is consistent with a seniority scheme description, configuration mixing plays a crucial role in describing the measured $B(E2)$ values in ^{100}Cd , with significant contributions from both proton and neutron core excitations.

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