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Approaching ^{100}Sn: Structural evolution in ^{98,100}Cd via lifetime measurements

Content

The nuclear structure of the doubly magic nucleus ^{100}Sn and its neighbouring isotopes has gained significant attention from both experimental and theoretical sides due to the valuable insights it offers for testing the nuclear shell model. Cd isotopes, two proton holes away from Sn, show a similar trend in spectroscopic information and reduced transition probabilities and are therefore instrumental for such studies. 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.

In the present work, we report on lifetime measurements of low-lying excited states below the 8^+ seniority isomer in the neutron-deficient ^{98,100}Cd isotopes. The experiment was performed at GSI-FAIR, as part of the FAIR Phase-0 program, where ions of interest were populated via a relativistic fragmentation reaction, 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 $LaBr_3$(Ce) array employing the Generalised Centroid Difference (GCD) method.

The recently-published results will be discussed and compared to shell model calculations, emphasizing the importance of core-breaking contributions as well as the relevance of the proton-neutron term in the interaction, providing crucial indications for understanding the nuclear structure in the region.

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