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New results in the region around doubly-magic ^{132}Sn from decay spectroscopy at RIBF and the isospin dependence of effective charges

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In the last decade, a considerable progress in the understanding of the structure of nuclei in the vicinity of ^{132}Sn , the heaviest doubly-magic nucleus far-off stability accessible for experimental studies, was achieved. The many results obtained in several experimental campaigns performed at the Radioactive Isotope Beam Facility (RIBF) in Japan, in combination with state-of-the-art theoretical investigations, contributed in a significant way to this progress [1-4]. In the present contribution, new results from an experiment dedicated to decay spectroscopy in the ^{132}Sn region performed during the EURICA campaign in 2014 will be discussed [5]. In particular, the known $I^\pi = 8_1^+$, $E_x = 2129\text{-keV}$ isomer in the semi-magic nucleus $^{130}\text{Cd}_{82}$ was populated in the projectile fission of a ^{238}U beam and the high counting statistics of the accumulated data allowed to determine the excitation energy, $E_x = 2001.2(7)\text{ keV}$, and half-life, $T_{1/2} = 57(3)\text{ ns}$, of the $I^\pi = 6_1^+$ state based on $\gamma\gamma$ coincidence information. The new experimental results, combined with available data for ^{134}Sn and large-scale shell model calculations, allowed to extract proton and neutron effective charges for ^{132}Sn , a doubly-magic nucleus far-off stability. A comparison to analogous data for ^{100}Sn provided first reliable information regarding the isospin dependence of the isoscalar and isovector effective charges in heavy nuclei.

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