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High-precision measurements in the direct vicinity of the doubly magic ^{100}Sn ($N=Z=50$) at ISOLDE/CERN

Friday, 28 October 2022 11:45 (35 minutes)

This dissertation award talk will describe the transition of the ISOLTRAP mass spectrometer at CERN from the well-established Penning-trap mass spectrometry (PTMS) technique, ToF-ICR, to the next-generation PTMS technique, called PI-ICR [PRL 110 (2013) 082501]. Using this revolutionary technique, we achieved the first mass measurements of the neutron-deficient indium isotopes $^{99-101}\text{In}$ in the direct vicinity of the doubly-magic ^{100}Sn ($N=Z=50$). These results allowed us to resolve a stark discrepancy in the β -decay energy of ^{100}Sn and thus provided a new atomic mass value of ^{100}Sn via its direct β -decay into ^{100}In [Nature Phys. 17, 1099 (2021)].

In this context, I will also present the first hyperfine spectroscopy results of these neutron-deficient indium isotopes, which provided the first experimental evidence for the nuclear deformation toward the doubly-magic ^{100}Sn .

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