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Collinear resonant ionization spectroscopy of neutron-deficient Tin approaching N=50

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Collinear resonant laser ionization spectroscopy is a powerful technique which can provide a unique insight in nuclear properties such as spin, electromagnetic moments and changes in mean-square charge radii from near doppler-free measurement of the hyperfine structure of exotic isotopes. This technique was recently used at the collinear resonant ionization spectroscopy (CRIS) beam line at ISOLDE-CERN, for studying nuclear structure properties of neutron-deficient Tin isotopes in the proximity of the heaviest self-conjugate doubly magic nucleus 100Sn. Extensive testing using a recently commissioned ion source allowed the development of several laser ionization schemes of Tin. The insight of their sensitivity to nuclear observables and overall efficiency laid foundation for the online study of the unstable nuclei. The successful experiment performed in August 2018 provided hyperfine spectrum of the neutron-deficient Sn isotopes, extending from 124Sn down to 104Sn. These new measurements allowed the determination of previously unknown electromagnetic properties of both ground states and isomeric states, shedding light on the nuclear structure evolution towards 100Sn.

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