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Nuclear Structure Studies by Measurements of Nuclear Spins, Moments and Charge Radii Via Collinear Laser Spectroscopy at ISOLDE

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High-resolution laser spectroscopy at ISOLDE gives access to properties of nuclear ground states and long-lived ($> 5\text{ms}$) isomeric states of radioactive nuclei far from stability, such as nuclear spins, nuclear magnetic and quadrupole moments and charge radii [1]. These fundamental properties of exotic nuclei provide important information for the investigation of the nuclear structure in different regions of nuclear chart. Currently, two complementary collinear laser spectroscopy set-ups are available at ISOLDE: one for optically detected Collinear Laser Spectroscopy (COLLAPS) [2] and one for Collinear Resonant Ionization Spectroscopy (CRIS) [3].

By combining these two techniques, the nuclear structure in several key regions of the nuclear chart is being studied, from the very neutron-deficient to the very neutron-rich side of the nuclear landscape. Recent results from studies in the Ca and Ni regions will be presented and an outlook to future opportunities will be presented.

References:

[1] P. Campbell et al., Progress in Particle and Nuclear Physics 86, 127 (2016).

[2] <http://collaps.web.cern.ch/>

[3] <http://isolde-cris.web.cern.ch/isolde-cris/>

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