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Nuclear structure studies by the measurements of nuclear spins, moments and charge radii via collinear laser spectroscopy: results and perspectives

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.High resolution laser spectroscopy gives access to properties of nuclear ground states and long-lived (> 5ms) isomeric states of radioactive nuclei far from stability, such as nuclear spins, nuclear magnetic and quadruple 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, Collinear Laser Spectroscopy (COLLAPS) [2] and Collinear Resonant Ionization Spectroscopy (CRIS) [3].

Combining these two techniques, the nuclear structure in several key regions of the nuclear chart can be investigated. 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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