



Nuclear structure studies by the measurement of nuclear spins, moments and charge radii via laser spectroscopy techniques

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High resolution laser spectroscopy can access to multiple nuclear properties of ground/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, Collinear Laser Spectroscopy (COLLAPS) and Collinear Resonant Ionization Spectroscopy (CRIS) [2].

Combining these two techniques, the nuclear structure in several key regions of the nuclear chart can be investigated, for example the structure of neutron-rich isotopes in the Ca region and in the Ni region, which just happens to be my research interest. Currently, several experiments are focusing on nuclear structure studies in these two regions [3-5].

In this talk, after an introduction of both the COLLAPS and CRIS techniques, I will mainly focus on my research interest on neutron-rich K[4], Sc[4] and Zn[3], Ge[5] isotopes using both experimental techniques. The results of nuclear spins, moments and charge radii of Zn isotopes, achieved from COLLAPS experiments, will be presented in details together with all the physics discussion [3]. For others, the physics motivation of each individual experiment and the status of the experiments will be introduced [4,5].

References:

[1] P. Campbell et al., Progress in Particle and Nuclear Physics 86, 127 (2016). [2] <http://collaps.web.cern.ch/> and <http://isolde-cris.web.cern.ch/isolde-cris/>
[3] X. F. Yang et al., Phys.Rev.Lett. 116, 182502 (2016); C.Wraith and X.F.Yang et al., in Preparation for Phys. Let. B (2016); L. Xie and X. F Yang et al, in preparation for Phys. Rev. C (2016) [4]X.F. Yang et al., CERN-INTC-2016-008/INTC-P-458, X.F. Yang et al., CERN-INTC-2015-051/INTC-P-451 ; X.F. Yang et al., CERN-INTC-2015-050/INTC-P-450 ;[5]M.Bissell,X.F.Yang et al., CERN-INTC-2016-035/INTC-P-472 ; X.F.Yang, M.Bissel et al., CERN-INTC-2016-036/INTC-I-170.

* The talk will be given in English language..

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