

Service de Physique Nucléaire  
SÉMINAIRE

\*\*\*\*\*

Vendredi 27/11/2015, 11h00-12h00

CEA Saclay, Orme des Merisiers Bat 703, p 135

Sensitive high-resolution laser spectroscopy studies in the  
calcium region

**R. F. Garcia Ruiz**

Instituut voor Kern-en Stralingsfysica, KU Leuven, B-3001 Leuven, Belgium; School of Physics  
and Astronomy, The University of Manchester, Manchester M13 9PL, UK

Laser spectroscopy techniques have been widely used to extract nuclear structure information on the ground state properties of exotic nuclei. Nuclear moments, spins and changes in the root-mean-squared nuclear charge radii can be measured in a model independent way [1].

Although a deeper understanding of the atomic nucleus has been reached by a joint effort between theorists and experimentalists, key questions remain unresolved far way from stability, where radioactive isotopes can only be produced at very low rates ( $\lesssim 100$  ions/s). With the aim of studying such regions of the nuclear chart, this seminar presents some of the latest results on the developments of high sensitivity laser spectroscopy techniques.

High-resolution measurements of the hyperfine structure spectra and isotope shifts of K(Z=19) and Ca(Z=20) isotopes were obtained by using collinear laser spectroscopy at ISOLDE, CERN, expanding our experimental knowledge of the ground state properties of these isotopes up to N=32 [2-6]. The current developments to extend these measurements beyond N=32 [7] and the perspectives for future experiments using collinear resonance ionization spectroscopy [8,9] in the Ca region will be discussed.

- [1] P. Campbell, I.D. Moore, M.R. Pearson. Prog. Part. Nucl. Phys. In press (2015).
- [2] Papuga, J. et al. Phys. Rev. Lett. 119, 172503 (2013).
- [3] Papuga J. et al., Phys. Rev. C 90, 034321 (2014).
- [4] Kreim, K. et al. Phys. Lett. B 731, 97 (2014).
- [5] Garcia Ruiz, R.F. et al.. Phys. Rev. C 91, 041304(R) (2015).
- [6] Garcia Ruiz, R.F. et al. Submitted (2015).
- [7] Garcia Ruiz, R.F. et al. In preparation (2015).
- [8] K. T. Flanagan et al., Phys. Rev. Lett. 111, 212501 (2013).
- [9] R.P. De Groote et al., Phys. Rev. Lett. 115, 132501 (2015).

---

Le cafe sera servi 10 minutes avant  
Contact : acorsi@cea.fr - Tel : +33 1 69 08 7554

[http://irfu.cea.fr/Sphn/Phocea/Vie\\_des\\_labos/Seminaires/index.php](http://irfu.cea.fr/Sphn/Phocea/Vie_des_labos/Seminaires/index.php)