Contribution ID: **18** Type: **Invited**

Structure of Potassium and Calcium isotopes studied by Collinear Laser Spectroscopy

Monday 15 December 2014 16:30 (30 minutes)

We have investigated the ground state structure of K and Ca over a wide range of isotopes, from below N=20 across the N=28 shell gap using the bunched-beam collinear laser spectroscopy technique. Thanks to the background reduction using the bunched-beam correlation method and the improved optical detection using a newly-designed detection set-up, experiments could be extended for both K and Ca up to N=32 (51K and 52Ca respectively).

From the magnetic moments and spins of the K isotopes, the evolution of the proton single particle levels can be studies as the neutron p3/2 level is being filled [1,2]. The isotope shifts provide information on the change in mean square charge radii across the N=28 shell gap, showing a strong increase towards N=32, both for K and Ca [3,4]. The isomer shift in the N=Z mirror nucleus 38K reveals the importance of proton-neutron pairing correlations in the 0+ isomeric state [5]. The magnetic and quadrupole moments of the 47,49,51Ca ground states provide a stringent test to recent calculations including 3N interactions [6].

Highlights from these experiments will be presented.

[1] J. Papuga et al., Phys. Rev. Lett. 110, 172503 (2013)

[2] J. Papuga et al., Phys. Rev. C 90, 034321 (2014)

[3] K. Kreim et al., Phys. Lett. B 731, 97 (2014)

[4] M.L. Bissell et al, to be published

[5] M.L. Bissell et al., Phys. Rev. Lett. 113, 052502 (2014)

[6] R.F. Garcia Ruiz et al., in preparation.

Author: Prof. NEYENS, Gerda (K.U. Leuven)

Presenter: Prof. NEYENS, Gerda (K.U. Leuven)

Session Classification: Ground-State Properties