

# Ultra-sensitive laser spectroscopy on Ca isotopes

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A program of bunched beam collinear laser spectroscopy at the COLLAPS beam line has recently focussed on the nuclear structure evolution around  $N = 32$ , in neutron rich K [1,2], Mn [3] and Ca [4] isotopes. The current results obtained from optical detection of calcium isotopes will be presented, in which hyperfine structures and isotope shifts were measured for the first time in  $^{49,51,52}\text{Ca}$ . With these new experimental results, the charge radii, magnetic moments and electrostatic quadrupole moments have been determined.

With a production yield of  $^{52}\text{Ca}$  ( $N=32$ ) estimated at  $\sim 300$  ions/s, optical detection techniques are not suitable for measurements beyond  $N=32$ . In order to extend the program up to  $^{53}\text{Ca}$  ( $\sim 100$  ions/s) and  $^{54}\text{Ca}$  ( $\sim 10$  ions/s), substantial modifications to the COLLAPS beam line are in progress. With these modifications we will implement an ultra-sensitive particle detection scheme [5]. The current developments towards the design, simulation and implementation of the beam line will be explored.

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[3] C. Bradley, et al., CERN-INTC-2010-073 INTC-P-286.

[4] M.L. Bissell, et al., CERN-INTC-2011-049 INTC-P-313.

[5] L. Vermeeren, et al., Phys. Rev. Lett. 68 (1992) 1679.

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