Laser and mass spectroscopy of exotic silver isotopes below N=50 shell-closure

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The heaviest bound self-conjugate doubly-magic nucleus, ^{100}Sn, is the cornerstone of the nuclear chart region. Its proximity to the proton drip-line, role as the end-point in an alpha-decay chain, having the largest Gamow-Teller strength so far measured in allowed nuclear β-decay, and features such as the tensor force critically affecting its shell-structure make it, and its immediate vicinity, exciting for nuclear physics studies [1]. However, as the reaction cross-sections drop rapidly towards the N=Z line, many of the nuclear properties in the immediate region of ^{100}Sn have not been studied.

The advances in Penning trap techniques, combined with efficient inductively heated hot cavity catcher laser ion source (HCLIS), have recently enabled ultra-sensitive Phase-Imaging Ion-Cyclotron-Resonance (PI-ICR) assisted in-source resonance ionization spectroscopy [2]. This novel combination of techniques, realised at the IGISOL facility [3] at the University of Jyväskylä Accelerator Laboratory, was used to cross the N=50 shell closure near ^{100}Sn for the first time with the charge-radii measurement of ^{96}Ag. Since then, further measurements using similar techniques have extended down to ^{95}Ag.

In this contribution I will present the breakthrough experimental setup and its first application to the measurement of the charge radii of ^{96}Ag. I will also present the most recent results on masses, charge radii and magnetic moment down to ^{95}Ag. Furthermore, the ongoing campaign to resolve the long-standing conundrum of the two-proton decay in ^{94}Ag will be discussed along with prospects of delving even further even further into the immediate region near ^{100}Sn.

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[3] I. D. Moore *et al.*, Hyperfine Interactions **223(1)** (2014) 17-62.