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Collinear Resonance Ionization Spectroscopy of neutron-deficient antimony

Neutron deficient antimony isotopes provide an excellent study of nuclear structure around the doubly magic ^{100}Sn (N=Z=50). With a single valence proton above the Z=50 Sn, Sb can be used as a rigorous test of the single particle shell model around this closed shell. Measuring the neutron deficient Sb isotopes allows for investigation into the robustness of the magic Z=50 core. Significant effort has been invested into this region using a variety of laser spectroscopy techniques studying Cd (Z=47) [1], Ag (Z=48) [2,3], In (Z=49) [4-7], Sn(Z=50) [8] and Sb (Z=51) [9,10], including previous CRIS campaigns.

The Collinear Resonance Ionization Spectroscopy (CRIS) experiment at ISOLDE can measure the electromagnetic moments, spins and changes in mean squared charge radii across an isotopic chain. This allows us to deduce the single particle behaviour of the neutron deficient Sb isotopes and the effect of the additional proton outside of the closed Sn shell.

This contribution aims to introduce this experimental campaign and the CRIS experiment to discuss the recent results measuring $^{111-123}$Sb, which will allow determination of the electromagnetic moments and spins of these nuclei. This work will also discuss the further improvements of the CRIS experiment using field ionization which aims to provide additional background suppression by an order of magnitude [11], granting access to further exotic cases closer to the proton drip line.

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Primary author: MCGLONE, Abigail Charlotte (The University of Manchester (GB))

Presenter: MCGLONE, Abigail Charlotte (The University of Manchester (GB))

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