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Decay spectroscopy with isomeric beams using the GRIFFIN spectrometer at TRIUMF

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The ISOL technique of producing radioactive beams at TRIUMF [1] is well recognized for producing exotic species in both their ground- and isomeric states. The beta and beta-delayed-neutron decay of ground spin and isomeric states has been investigated with the GRIFFIN spectrometer [2], consisting of up to 16 Compton-suppressed hyper purity Germanium detectors for gamma-ray detection and augmented with a suite of ancillary detectors for beta-particle- and conversion electrons-tagging, and fast life-time measurements of nuclear states. Particular configurations of the GRIFFIN experimental setup lead to a superior gamma-ray efficiency and low peak-to-total background, and allow for determination of angular momenta and parity of states. In this talk we will present several comprehensive decay spectroscopy experiments in nuclei close to the magic proton numbers 28 and 50 and magic neutron number 82, populated by the decay of ground state and isomeric beams of $^{129,131,132}\text{In}$ [3-5] and ^{80}Ga [6,7]. Due to the high-efficiency of the experimental set-up we were able to improve beta-delayed neutron values for $^{131,132}\text{Sn}$ and observe a new beta-decay branch in ^{129}Sn , and we shone a light in the shape coexistence debate near the doubly magic ^{78}Ni . Finally, by expanding the knowledge and information available near two regions of magicity, we provided crucial inputs to improve the nuclear shell model, especially in the case of ^{131}Sn and ^{80}Ge .

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Primary author: ANDREOIU, Corina (Simon Fraser University)

Presenter: ANDREOIU, Corina (Simon Fraser University)

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