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The nuclear structure of ^{118}Sn studied through the β-decay of ^{118}In at TRIUMF

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The isotopes of tin are of great interest to the study of nuclear shell evolution, as they span from doubly magic ^{100}Sn to ^{132}Sn and beyond. Due to the highly stable closed shell of fifty protons, the even-even tin isotopes mid-shell between $N = 50$ and $N = 82$ are known to be spherical in their ground state. However, low-lying deformed states due to 2p-2h excitations across the closed proton shell are also observed and it is important to determine the degree of mixing between the deformed states and the "normal" states for theoretical models. The 2p-2h rotational band built on an excited 0^+ state has been observed in many studies on ^{118}Sn. New measurements to further characterize this rotational band in ^{118}Sn have been made using the Gamma Ray Infrastructure For Fundamental Investigations of Nuclei (GRIFFIN) at the TRIUMF-ISAC facility. GRIFFIN's powerful array of sixteen HPGe clover detectors provides excellent energy resolution and efficiency for identifying and separating low intensity gamma rays, and can be used in coincidence mode to place newly observed transitions. Discrepancies between two studies on the intensities of a ≈285˜keV triplet have been identified using γ-γ coincidence measurements. Most notably, the branching ratio of a 284.6˜keV transition within the intruder band was measured to be half of the previously reported value, leading to a change in its B(E2; $2_2^+ \rightarrow 0_2^+$) value from 39(7) W.u. to 18(3) W.u.. Further to these findings, forty four newly observed transitions and one new energy level have been placed in the level scheme and will be discussed.

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