

Spectroscopy of A=100 nuclei with GRIFFIN

A sudden ground-state shape transition is known to occur sharply at $N = 60$, accompanied by equally dramatic changes in the low-energy spectra of the nuclei with $A \approx 100$. Detailed spectroscopic data on the γ decay of ^{100}Zr are essential for understanding this phase transition and the emergence of shape coexistence, predicted by recent Monte Carlo Shell Model (MCSM) calculations.

Studying ^{100}Zr via γ -ray spectroscopy following β decay presents an experimental challenge due to the refractory nature of ^{100}Y , which prevents its direct extraction at Isotope Separator On-Line (ISOL) facilities. To overcome this, a beam mixture of ^{100}Rb and ^{100}Sr was delivered to a tape in the center of the powerful Gamma Ray Infrastructure For Fundamental Investigations of Nuclei (GRIFFIN) spectrometer at the TRIUMF facility.

The use of a tape station facilitated the selective separation of short-lived activity, permitting the disentanglement of the complex γ -ray spectra. The collected $\gamma - \gamma$ coincidence data allowed for vastly extending the previously known level scheme of ^{100}Zr and to unambiguously assign the spins of key states via $\gamma - \gamma$ angular correlations.

Selected results will be presented, including evidence for the recently found 0_4^+ state in ^{100}Zr , which was predicted by MCSM to possess a spherical shape. Candidates for a spin-2 member of a band presumably built on the 0_4^+ state will be discussed. Branching and mixing ratios will be used to test the existing structural interpretations.

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