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WITHDRAWN - Shape coexistence in the Pb region: A systematic study of the even $^{188-200}$Hg with GRIFFIN

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Shape coexistence is a unique phenomenon of the atomic core in which the nucleus displays intrinsically different shapes in a small energy range. Two of the main observables which have emerged as model-independent probes of this phenomenon are the measurement of transition strengths, in particular B(E2) and ρ^2(E0) [1]. These transition strengths are particularly sensitive to the wavefunctions of the states they connect, and thus are one of the most stringent tests the different theoretical models used to describe nuclei.

The n-deficient Pb region (to the south-west of Z=82, N=126) is characterized by clear examples of shape coexistence [1]. A large odd-even, and ground state-isomer, staggering of the isotope shifts was observed in the light Hg (Z=80) isotopes that expresses the differently shaped potentials existing in these nuclei causing deformation [2]. Only recently, a COULEX experiment obtained detailed information about shape coexistence for $^{182-188}$Hg [3]. Still, there are plenty of key elements not yet measured, especially in the transitional isotopes between the stable ^{200}Hg and the beginning of the midshell ^{190}Hg. In these transitional isotopes, the ground and intruder configurations are still reasonably separated in energy (the relative energy of the intruder states has a parabola-shape with a minimum at ^{182}Hg), thus reducing to negligible levels the mixing between the two bands. These isotopes present a good opportunity to benchmark the normal ground-state configuration without the perturbations experienced in the lighter isotopes, thus simplifying the comparison with different theoretical calculations.

In order to characterize the evolution of the transitional Hg isotopes, a systematic study of the decay of the n-deficient $^{188-200m}$Tl into Hg has been performed using the GRIFFIN spectrometer at TRIUMF-ISAC. Data collected with the ancillary $LaBr_3$(Ce) array, have been analyzed with the Generalized Centroid Difference Method (GCDM) [4] to precisely measure lifetimes of all the first 2^+, 4^+ as well as some negative-parity and non-yrast states. The extracted B(E2) values are compared with different IBM calculations while the negative-parity band is interpreted in comparison with a particle-rotor model. High statistics results for lifetimes, conversion-electrons, angular correlations and precise branching ratios, which all help in forming a complete picture of the band structure of these isotopes, will be discussed.

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