

Abstract Submitted
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Understanding quantum phase behavior through gamma-ray spectroscopy of ^{154}Gd ZOE REHAV, Department of Physics, Truman State University, Kirksville, MO 63501, USA, E. A. MCCUTCHAN, National Nuclear Data Center, Brookhaven National Laboratory, Upton, New York 11973, USA, S. ZHU, C. J. LISTER, J. P. GREENE, M. P. CARPENTER, R. V. F. JANSSENS, T. L. KHOO, T. LAURITSEN, D. SEWEYNIK, Physics Division, Argonne National Laboratory, Argonne, Illinois 60439, USA — Nuclei that undergo rapid transitions from spherical to deformed states can be modeled using quantum phase transitions. At $N=90$, discontinuous binding-energies indicate the simultaneous existence of spherical and deformed structures. To expand upon our knowledge of quantum phase transitional behavior at $N=90$, the decay of ^{154}Eu to ^{154}Gd was studied with the Gammasphere array at Argonne National Laboratory. The ultra high statistics data set allowed for precise determination of transition intensities between low-lying states in ^{154}Gd important for interpretation of its structure. The new intensities will be used to re-evaluate the efficiency of various theoretical models to describe the phase and shape transition of ^{154}Gd . This work was supported by the DOE Office of Nuclear Physics under contract DE-AC02-06CH11357 and DE-AC02-98CH10946.

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