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Experimental Investigation of Nuclear Tidal Waves in ^{102}Pd[1]
A.D. AYANGEAKAA, U. GARG, S. FRAUENDORF, J.T. MATTA, D. PATEL, Department of Physics, University of Notre Dame, Notre Dame, IN 46556, R. CHAKRABARTI, S.S. GHUGRE, UGC-DAE Consortium for Science Research, Kolkata, India, S. MUKHOPADHYAY, Mississippi State University, Mississippi State, MS 39762, M.P. CARPENTER, F. KONDEV, D. SEWERYNIAK, S. ZHU, Physics Division, Argonne National Laboratory, Argonne, IL 60439 — The region of the transitional nuclei has been shown to exhibit yrast state properties that are intermediate between those of a rotor and a vibrator and have been described in the Tidal Wave theory as quadrupole running waves on the surface of the nucleus. The concept of nuclear tidal waves allows for the microscopic calculation of the energies and transition probabilities of yrast states by means of the cranked mean field theory. In the present study, we investigated this concept by measuring lifetimes of the yrast band in the ^{102}Pd nucleus using the $^{76}Ge(^{30}Si, 4n)^{102}Pd$ reaction with GAMMASPHERE. Tidal wave calculations have shown that ^{102}Pd is a candidate nucleus for affirming this phenomenon in the transitional region. The extracted B(E2)'s for the yrast band appear to follow the increase with spin predicted by theory.

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