

Abstract Submitted  
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**Multiple Excited Superdeformed Bands in  $^{154}\text{Dy}$** <sup>1</sup> Q.A. IJAZ, W.C. MA, A.V. AFANASJEV, H. ABUSARA, Y.B. XU, R.B. YADAV, Y.C. ZHANG, Mississippi State Univ., M.P. CARPENTER, R.V.F. JANSSENS, T.L. KHOO, T. LAURITSEN, D.T. NISIUS, Argonne National Lab — The  $^{154}\text{Dy}$  nucleus is located near the upper boundary of the region of superdeformation centered around the doubly magic SD nucleus  $^{152}\text{Dy}$ . In order to further explore the limits of this SD island and to understand the evolution of the proton and neutron orbitals at superdeformation, a detailed study of SD structures in  $^{154}\text{Dy}$  has been carried out through the  $^{122}\text{Sn}(^{36}\text{S}, 4n)$  reaction with the use of the Gammasphere detector array. The high statistics data set has allowed the identification of four new excited SD bands, in addition to the previously observed yrast SD band. The intensities of the bands range from  $\sim 0.7\%$  to  $\sim 0.05\%$  relative to the strongest transition in this nucleus. Detailed properties of the bands, including their transition energies, dynamic moments of inertia, decay patterns, as well as the similarities and differences between these new bands and the SD bands in neighboring nuclei, will be presented. The intrinsic configurations of the bands will be discussed based on Cranked Relativistic Mean Field calculations and the effective alignment method.

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