

Abstract Submitted
for the DNP06 Meeting of
The American Physical Society

135Ba - A First Test of the E(5/4) Bose-Fermi Symmetry¹ M.S. FETEA, Department of Physics, University of Richmond, Richmond, VA 23173 and Wright Nuclear Structure Laboratory, Yale University, New Haven, CT 06520 (WNSL), R.B. CAKIRLI, WNSL and Department of Physics, University of Istanbul, Istanbul, Turkey, R.F. CASTEN, WNSL, D.D. WARNER, WNSL and Daresbury Laboratory, Warrington WA44AD, UK, E.A. MCCUTCHAN, D.A. MEYER, A. HEINZ, H. AI, G. GURDAL, J. QIAN, R. WINKLER, WNSL — Very recently, the first case of a critical point Bose-Fermi symmetry for odd-mass nuclei, E(5/4) was developed. It describes analytically a gamma-soft critical point E(5) core coupled to a $j = 3/2$ particle, where E(5) represents a second order phase transition from a vibrator U(5) to a gamma-soft rotor O(6). Since 134Ba has been found to be an empirical manifestation of E(5), 135Ba - in which the last neutron can occupy the 2d3/2 orbit, is the natural initial test of E(5/4). To complement this test and provide a perspective, we performed shell model and interacting boson-fermion approximation calculations. We will present the work and discuss the results. We will show that E(5/4) can account for some of the observables in 135Ba but that it does not provide a fully satisfactory description. Specifically, many of the collective and forbidden B(E2) values of E(5/4) agree well with the data.

¹This work was supported by the NSF Grant PHY 0204811, the Research Corporation Grant CC5494, USDOE Grants DE-FG02-91ER-40609 and DE-FG02-88ER-40417, and the Flint Fund.

Mirela Fetea
Dept. of Physics, University of Richmond, Richmond, VA 23173
and Wright Nuclear Structure Laboratory, Yale University
New Haven, CT 06520 (WNSL)

Date submitted: 20 Jun 2006

Electronic form version 1.4