Abstract Submitted
for the DNP06 Meeting of
The American Physical Society

Evolution of shape phase transitions as functions of energy, spin, and boson number in the Interacting Boson Model E. WILLIAMS, R. J. CASPERSON, V. WERNER, Wright Nuclear Structure Laboratory, Yale University, New Haven, CT 06520 — Shape phase transitions from spherical to deformed nuclei have been a subject of recent interest because explorations of such behavior have led to a greater understanding of the evolution of collectivity throughout the nuclear landscape. Two critical points in particular, X(5), a first order phase transition, and E (5), a second order phase transition, were identified in the geometrical model. Recent work within the context of the Interacting Boson Model (IBM) has explored these regions in the finite N limit corresponding to realistic nuclei. IBM calculations extending to large boson numbers provide powerful tools for relating transitional behavior observed in nuclei to phase transitions in macroscopic systems. A study of first and second order phase transitions in the large boson limit as functions of N, spin, and energy has been undertaken with the use of a variety of observables, including both electromagnetic transitions, and energies. The results of this investigation will be presented. Work supported by US DOE grant number DE-FG02- 91ER-40609.

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Date submitted: 30 Jun 2006 Electronic form version 1.4