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Probing asymptotic behavior of quantum shape phase transitional systems with angular momentum[1] E. WILLIAMS, R.J. CASPERSON, V. WERNER, Yale University — Scaling properties of quantum phase transitional (QPT) systems in atomic nuclei have been a subject of great interest in recent years, as the manner in which a system scales with system size is intimately connected to fundamental system dynamics, and provides a means of relating properties of finite, experimentally accessible QPT systems to their infinite size counterparts. In the present work, the scaling behavior of finite nuclear systems in the large boson limit is explored within the context of the Interacting Boson Model-1 for both first and second order QPT systems. The expected power law relationship between energies, transition strengths, and shape invariants with increasing boson number at the critical point in the continuous limit will be tested, and the effects of angular momentum on scaling properties of these observables will be investigated. The shape of the nuclear potential is found to strongly influence scaling behavior at the first order transition.

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Elizabeth Williams
Yale University

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