Abstract Submitted
for the DNP12 Meeting of
The American Physical Society

Testing Shell Stabilization at N = 80; g factor of the 2_1^+ state in ^{138}Ce F. NAQVI, V. WERNER, Wright Nuclear Structure Laboratory, Yale University, New Haven, CT 06511, USA, T. AHN, Wright Nuclear Structure Laboratory, Yale University, New Haven, CT 06511, USA/NSCL, MSU, USA, G. ILIE, N. COOPER, Wright Nuclear Structure Laboratory, Yale University, New Haven, CT 06511, USA, D. RADECK, Institut fuer Kernphysik, University of Cologne, 50937 Cologne, Germany, M.P. CARPENTER, C.J. CHIARA, F. KONDEV, T. LAURITSEN, C.J. LISTER, D. SEWERYNIAK, S. ZHU, Argonne National Laboratory, Argonne, IL 60439, USA — The study of observed mixed symmetry states in N = 80 isotones, namely ^{134}Xe, ^{136}Ba and ^{138}Ce manifest a large effect of single-particle structure on the evolution of these collective excitations. The observed fragmentation of $M1$ transition strength between the $(2^+_{1,ms})$ state and the $(2^+_{1,fs})$ state in ^{138}Ce and the largely unfragmented strength in ^{134}Xe and ^{136}Ba was attributed to the presence of a $\pi g_{7/2}$ subshell closure at $Z = 58$. To prove the validity of this proposed concept of shell stabilization, the g factor of the 2_1^+ in ^{138}Ce was measured. The low-lying excited states in ^{138}Ce were populated via inverse Coulomb excitation at ATLAS, ANL. To measure the g factor, the recoil into vacuum technique was used and attenuation of the angular distribution of emitted $2_1^+ \rightarrow 0^+\gamma$ rays was measured. The results of the ongoing analysis will be presented providing a constraint on the single-particle wavefunctions contributing to the collective states in the N = 80 isotones and guide theory in developing a consistent and predictive picture of the underlying single-particle dynamics.

Farheen Naqvi
Yale University

Date submitted: 06 Jul 2012 Electronic form version 1.4