Contribution ID: **207** Type: **Invited Presentation**

Study of ^{68}Co Low-energy Structure via β Decay

Tuesday, 30 May 2017 14:45 (15 minutes)

The N = 40 subshell closure, which arises from the energy separation of the νpf shell and the νg9/2 single-particle state, has long been investigated for its impact on nearby neutron-rich nuclei. The fragility of this N = 40 subshell closure is highlighted by the sudden onset of collectivity as protons are removed from the νf7/2 single-particle state. Cross-shell excitations have been used to describe the observation of shape coexistence between spherical and prolate-deformed configurations. Within the neutron-rich odd-A Co isotopes, shape coexistence is supported through the identification of a ($1/2^-$) shape isomer found at low energies alongside higher-spin states associated with the normal-order configurations. For ^{68}Co, a recent paper on a β-decay study at the National Superconducting Cyclotron Laboratory (NSCL) [1] concluded that the lowest-energy state can be attributed to a deformed configuration, further extending the presence of shape coexistence to this nucleus. This work reports on ^{68}Co as determined from the analysis of new data from NSCL utilizing the selectivity of low-spin β decay from ^{68}Fe to populate ^{68}Co. An expanded description of the low-lying structure of ^{68}Co will be presented.

This work was supported in part by the National Science Foundation (NSF) under Contract No. PHY-1102511 (NSCL) and Grant No. PHY-1350234 (CAREER), by the Department of Energy National Nuclear Security Administration (NNSA) under Grant No. DE-NA0002132 and Award No. DE-NA0003221 and through the Nuclear Science and Security Consortium under Award No's DE-NA0000979 and DE-NA0003180, by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics, under Contract No. DE-AC-06CH11357 (ANL) and Grant No's. DE-FG02-94ER40834 (UM) and DE-FG02-96ER40983 (UT), and by the U.S. Army Research Laboratory under Cooperative Agreement W911NF-12-2-0019.

References:

[1] S.N. Liddick et al., Phys. Rev. C 85, 014328 (2012).

Primary author: Dr CRIDER, B.P. (NSCL / MSU)

Co-authors: SPYROU, A. (NSCL / MSU); Mr DOMBOS, A.C. (NSCL / MSU); Dr AYANGEAKAA, A.D. (ANL); Dr CHIARA, C.J. (U.S. Army Research Laboratory / Oak Ridge Associated Universities Fellowship Program); Dr PROKOP, C.J. (LANL); Dr SEWERYNIAK, D. (ANL); Dr RECCHIA, F. (Università degli Studi di Padova); Dr DAVID, H.M. (ANL); Dr CHEN, J. (NSCL / MSU); Ms HARKER, J. (University of Maryland / ANL); Dr CARROLL, J.J. (U.S. Army Research Laboratory); Dr AL-SHUDIFAT, M. (Al al-Bayt University); Dr CARPENTER, M.P. (ANL); Dr LARSON, N.R. (NSCL / MSU); Prof. GRZYWACZ, R. (University of Tennessee); LEWIS, R. (NSCL / MSU); Dr JANSSENS, R.V.F. (ANL); Dr GO, S. (University of Tennessee); Dr SUCHYTA, S. (NSCL / MSU); Dr ZHU, S. (ANL); Dr QUINN, S.J. (NSCL / MSU); Prof. LIDDICK, S.N. (NSCL / MSU); Dr LAURITSEN, T. (ANL); Prof. WALTERS, W.B. (University of Maryland)

Presenter: Dr CRIDER, B.P. (NSCL / MSU)

Session Classification: Breakout 2