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Level structure of ^{67}Ni and the nature of yrast excitations near N=40 S. ZHU, R.V.F. JANSSENS, M.P. CARPENTER, T. LAURITSEN, D. SEWERYNIAK, X. WANG, Argonne National Laboratory, C.J. CHIARA, W.B. WALTERS, N. HOTELING, I. STEFANESCU, J.R. STONE, University of Maryland, R. BRODA, B. FORNAL, W. KROLAS, T. PAWLAT, J. WRZESINSKI, Niewodniczanski Institute for Nuclear Physics — The region of nuclei around $^{68}Ni_{40}$, with its closed proton shell and closed neutron harmonic-oscillator sub-shell, continues to be of much interest as recent data indicate the stabilizing effects of the N=40 gap are rather localized in N and Z. With a single neutron hole in ^{68}Ni, the structure of ^{67}Ni provides an opportunity for detailed comparisons with calculations using different effective interactions and for learning about the nature of the yrast excitations. A level scheme built on the previously known 13-μs isomer has been delineated up to an excitation energy of 5.3 MeV and a spin of 21/2. Shell model calculations have been carried out using two effective interactions in the $f_{5/2}pg_{9/2}$ model space with ^{56}Ni as a core. Satisfactory agreement between experiment and theory is achieved. Comparisons between experiment and calculations indicate that the yrast and near-yrast excitations are dominated by complex multi-particle-hole excitations. This work is supported in part by the U.S. DOE, Office of Nuclear Physics under contracts DE-AC02-06CH11357 and DE-FG02-94-ER40834.

S. Zhu
Argonne National Laboratory

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