Collectivity in neutron-rich Mn isotopes

S.N. LIDDICK, S. SUCHYTA, N. LARSON, B. ABROMEIT, M. BOLLA, (NSCL/MSU), A. AYRES, A. BEY, C. BINGHAM, L. CARTEGNI, M. MADURGA, M. MILLER, M. RAJABLI, R. GRZYWACZ, S. PAULAUSKAS, S. PADGETT, (UT), H.L. CRAWFORD, (LLBL), I.G. DARBY, (K.U. Leuven), K. RYKACZEWSKI, (ORNL), S. ILYUSHKIN, (Miss S.U.) — The rapid development of collectivity in the N = 40 region as protons are removed from the f_{7/2} single-particle state is suggested by the dramatic drop in energy of the first excited 2^+ state from $^{68}$Ni to $^{66}$Fe and the increase in B (E2) along the Fe isotopic chain. Recent large-scale shell model calculations which include the g_{9/2} and d_{5/2} single-particle states have attributed the increased collectivity in the Cr and Fe nuclei to the influence of multi-particle neutron excitations across N = 40. While a variety of experiments have focused on even-even nuclei, including Cr and Fe, very little is known about the odd-Z isotopes. To explore the influence of the intruder neutron g_{9/2} and d_{5/2} states, the beta decays of the Cr isotopes into the respective Mn nuclei were studied at the NSCL. Preliminary low-energy level structures for the Mn isotopes will be presented.

S.N. Liddick

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