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Beta-decay spectroscopy with a digital data acquisition system
S.N. LIDDICK, H.L. CRAWFORD, S.A. SUCHYTA, NSCL/MSU, C.J. CHIARA, UMaryland/ANL, W.B. WALTERS, UMaryland — Decay spectroscopy is a sensitive technique for exploring the properties of exotic nuclei. The application of digital electronics to decay spectroscopy experiments further increases the reach of beta-decay studies. Recently, a complete digital data acquisition system has been implemented at NSCL for beta- delayed gamma-ray spectroscopy. The system consists of a highly- segmented double-sided Si strip detector surrounded by 16 Ge detectors of the SeGA array. Among the benefits of the digital data acquisition system are improved energy resolution and thresholds for signals in both the Si and Ge detectors. The lower threshold in the Si detector translates into an increased efficiency for detecting a beta-decay electron. Further, the dead time of the digital data acquisition system is dramatically reduced compared to the previous analog system. A description of the system and its performance in beta-decay spectroscopy studies in neutron-rich Cr and Mn isotopes will be presented.

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