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Feasibility Study of NI's FlexRIO Platform for High-Throughput Data Acquisition AARON SPROW, CHRISTOPHER CRAWFORD, SIMON LOVELL, University of Kentucky, NAB COLLABORATION — The Nab neutron decay correlation experiment requires high energy and time resolution, and a multipixel low threshold trigger to efficiently detect 30 keV protons. Digital waveforms must be read out for offline pulse-shape analysis from all neighboring channels of hits in the two 128-pixel ion implanted silicon detectors. National Instrument's FlexRIO system has a unique data acquisition architecture based on a single 500 ms ring buffer which continuously records data. Custom discriminators can be programmed by the user on the FPGA with LabVIEW graphical programming language, and multichannel trigger logic can be implemented on the CPU using the bidirectional, high bandwidth, low latency PCI bus. We developed a low-threshold trigger using a trapezoid energy filter to test the feasibility of this system. We will present our experience programming the trigger and the resulting performance, including detection efficiency and background noise rejection.

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