

Abstract Submitted
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Data acquisition for the UCNB experiment SKY SJUE, Los Alamos National Laboratory, UCNB COLLABORATION — The UCNB experiment will simultaneously detect protons and electrons from the beta decay of ultracold neutrons (UCN) to measure the neutrino asymmetry B using 2 mm-thick, 128 pixel-segmented Si detectors (also in development for the Nab experiment). The data acquisition system must provide timing resolution on the order of nanoseconds with minimal dead time to detect coincidences and backscattering of electrons from the Si detector. Proton detection will be achieved by biasing the entire detector and detector mount to roughly -30 kilovolts. Detection of these protons requires a low noise threshold and good energy resolution. The system must be scalable to simultaneously operate 256 channels on two detectors for the fully instrumented experiment. The performance of a 12 bit, 250 MHz flash ADC data acquisition system meets these requirements. Customized triggering algorithms using the system's FPGA allow a low noise threshold while keeping the rate adequately low and providing ample waveform data for our resolution requirements. We will present data from low energy beta emitters and electron-proton coincidences from the decay of UCN at the LANL source to demonstrate the performance of this system.

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