

Abstract Submitted
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Performance of the Nab segmented silicon detectors: GEANT4 and data¹ EMIL FRLEZ, University of Virginia, NAB COLLABORATION — The Nab Collaboration has proposed to measure neutron β -decay correlation parameters a and b at the Oak Ridge National Laboratory using a custom superconducting spectrometer and novel Si detectors. Two large area 2-mm thick silicon detectors, each segmented into 127 hexagonal pixels, will be used to detect the proton and electron from cold neutron decay. We present GEANT4 Monte Carlo simulations of the Si detector energy and timing responses to electrons below 1 MeV and to 30 keV protons with realistic simulated amplified anode waveforms. Both the data acquired with a prototype detector at Los Alamos National Laboratory with radioactive sources and the synthetic waveforms are analyzed by the same code. Energy and timing responses of the Si detectors are discussed, with the MC waveforms calibrated to the decay constants, baselines, noise, gains, and timing offsets extracted from measured data, pixel by pixel.

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