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Modeling the Nab Experiment Electronics in SPICE ALEXANDER BLOSE, CHRISTOPHER CRAWFORD, AARON SPROW, Univ of Kentucky, NAB COLLABORATION — The goal of the Nab experiment is to measure the neutron decay coefficients a , the electron-neutrino correlation, as well as b , the Fierz interference term to precisely test the Standard Model, as well as probe for Beyond the Standard Model physics. In this experiment, protons from the beta decay of the neutron are guided through a magnetic field into a Silicon detector. Event reconstruction will be achieved via time-of-flight measurement for the proton and direct measurement of the coincident electron energy in highly segmented silicon detectors, so the amplification circuitry needs to preserve fast timing, provide good amplitude resolution, and be packaged in a high-density format. We have designed a SPICE simulation to model the full electronics chain for the Nab experiment in order to understand the contributions of each stage and optimize them for performance. Additionally, analytic solutions to each of the components have been determined where available. We will present a comparison of the output from the SPICE model, analytic solution, and empirically determined data.

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