Abstract Submitted
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Monte Carlo Simulation of Detector Response in the Nab Experiment[1] DAVID MCLAUGHLIN, University of Virginia, NAB COLLABORATION — The Nab experiment aims at a precise measurement of a, the electron neutrino correlation parameter, and b, the Fierz interference term, in neutron decay. The measurement is to be performed at the Spallation Neutron Source (SNS) in Oak Ridge, TN, using an asymmetric magneto-electrostatic spectrometer. The spectrometer uses two hexagonally segmented large silicon detectors, one located at each end of the spectrometer. Two systematics of the spectrometer are of particular relevance. To correlate proton and electron hits, it is necessary to study the pixel correlation of the two decay products. Furthermore it is necessary to analyze the timing offset due to the greater stopping depth of the electrons, especially those of higher energies. Different timing offsets caused by differences in propagation time in the detector affect the reconstructed proton momentum. Both have been studied using Monte Carlo Simulation of the spectrometer in GEANT4; results for both effects will be presented.

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