Abstract Submitted for the SES19 Meeting of The American Physical Society

Radioactive Decay Simulations for Testing of the Timing Detectors in the Nab Experiment¹ REBECCA GODRI, JOSHUA HAMBLEN, University of Tennessee, Chattanooga, AARON JEZGHANI, University of Kentucky , DEREK HOLMAN, University of Tennessee, Chattanooga, NAB COLLABORA-TION — Located at the Spallation Neutron Source in Oak Ridge National Lab, the Nab experiment aims to yield a measurement of the electron-neutrino correlation parameter, a, and the Fierz interference term, b, in neutron beta decay. These parameters are located in the energy and the angular distribution of the particles produced through neutron beta decay. Using silicon detectors, a direct measurement of the phase space distribution of the resultant electron energy and proton momentum can be obtained. The silicon detectors of the Nab experiment will be tested using well-known radioactive isotopes. Simulations of systematic testing use the associated energy levels, decay probabilities, and decay options of radioactive sources such as ¹³⁹Ce, ¹³³Ba, and ¹¹³Sn to determine the expected results of experimental testing. Presented here is an analysis of the Monte Carlo simulations of the radioactive decay of ¹³⁹Ce, ¹³³Ba, and ¹¹³Sn and their ability to be useful to the Nab experiment as a whole.

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