

Abstract Submitted  
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**A Monte Carlo Simulation for Understanding Energy Measurements of Beta Particles Detected by the UCNb Experiment** CHI FENG, California Institute of Technology, UCNB COLLABORATION — It is theorized that contributions to the Fierz interference term from scalar interaction beyond the Standard Model could be detectable in the spectrum of neutron beta-decay. The UCNb experiment run at the Los Alamos Neutron Science Center aims to accurately measure the neutron beta-decay energy spectrum to detect a nonzero interference term. The instrument consists of a cubic “integrating sphere” calorimeter attached with up to 4 photomultiplier tubes. The inside of the calorimeter is coated with white paint and a thin UV scintillating layer made of deuterated polystyrene to contain the ultracold neutrons. A Monte Carlo simulation using the Geant4 toolkit is developed in order to provide an accurate method of energy reconstruction. Offline calibration with the Kellogg Radiation Laboratory 140 keV electron gun and conversion electron sources will be used to validate the Monte Carlo simulation to give confidence in the energy reconstruction methods and to better understand systematics in the experiment data.

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