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Characterization of large area, thick, and segmented silicon detector for electron and proton detection from neutron beta decay experiments in the cold and ultracold energies AMERICO SALAS BACCI, University of Virginia, PATRICK MCGAUGHEY, Los Alamos National Laboratory, STEFAN BAESSLER, University of Virginia, LEAH BROUSSARD, North Carolina State University, MARK MAKELA, JACQUELINE MIRABAL, Los Alamos National Laboratory, ROBERT PATTIE, North Carolina State University, DINKO POCANIC, University of Virginia, SETH HOEDL, North Carolina State University, SKY SJUE, Los Alamos National Laboratory, SEPPO PENTTILA, Oak Ridge National Laboratory, SYED HASAN, University of Kentucky, SCOTT WILBURN, Los Alamos National Laboratory, ALBERT YOUNG, BRYAN ZECK, North Carolina State University, ZHEHUI WANG, Los Alamos National Laboratory, NAB COLLABORATION, UCNB COLLABORATION — The "Nab" and "UCNB" collaborations have proposed to measure the correlation parameters in neutron β-decay at Oak Ridge and Los Alamos National Laboratory, using a novel detector design and electromagnetic spectrometers. Two large area, thick, hexagonal-segmented Silicon detectors containing 128 pixels per detector are going to be used to detect the electron and proton from neutron decay. Both Silicon detectors are connected by magnetic field lines of few Tesla field strength, and set on an electrostatic potential, such that protons can be accelerated up to 30 keV in order to be detected. We report the characterization, operation, proton detection from 15 to 30 keV, total pulse height defect, computation of atomic scattering defect, recombination defect, and evaluation of dead layer for these large area and thick Silicon detectors.

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