Abstract Submitted
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Construction of a 1 MeV Electron Accelerator for High Precision Beta Decay Studies[1] BRENDEN LONGFELLOW, University of North Carolina at Chapel Hill — Beta decay energy calibration for detectors is typically established using conversion sources. However, the calibration points from conversion sources are not evenly distributed over the beta energy spectrum and the foil backing of the conversion sources produces perturbations in the calibration spectrum. To improve this, an external, tunable electron beam coupled by a magnetic field can be used to calibrate the detector. The 1 MeV electron accelerator in development at Triangle Universities Nuclear Laboratory (TUNL) utilizes a pelletron charging system. The electron gun shoots 10^4 electrons per second with an energy range of 50 keV to 1 MeV and is pulsed at a 10 kHz rate with a few ns width. The magnetic field in the spectrometer is 1 T and guiding fields of 0.01 to 0.05 T for the electron gun are used to produce a range of pitch angles. This accelerator can be used to calibrate detectors evenly over its energy range and determine the detector response over a range of pitch angles.

[1]TUNL REU Program

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