

Abstract Submitted
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Overview of the Calcium-45 Beta Spectrum Measurement at Los Alamos National Laboratory CAMEN ROYSE, North Carolina State University, NAB/UNCB TEAMS COLLABORATION — One smoking gun of BSM physics would be the observation of a non-zero Fierz interference term, a feature in the beta spectrum produced by scalar and tensor couplings. Calcium-45 is an almost ideal candidate with which to search for a Fierz term. It is a pure beta emitter with a low endpoint of 256 keV and a simple decay scheme, with a $7/2^- \rightarrow 7/2^-$ g.s. to g.s. branching ratio of 99.9981(11)%. Isospin selection rules ensure the decay is greater than about 98.5% pure Gamow-Teller and the integrated effect of the weak magnetism over the entire spectrum is expected to be only 0.13%. An experiment designed to precisely measure the beta spectrum of Ca-45 has been run over the past two summers at Los Alamos National Laboratory. The experiment is composed of a 4π -capture magnetic spectrometer between two segmented arrays of hexagonal silicon detectors (similar to the Nab experiment), a helium gas cooling system, front end electronics and amplifiers, and a data acquisition system which synchronizes the timing from the signals coming from both detector arrays. Data is analyzed to account for the pile-up of signals and other physical and calibration factors. An overview of the design and execution of the experiment as divided into the above topics will be presented.

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