

Abstract Submitted
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Development of a Data-Acquisition System for a Low-Background BEGe Detector¹ GRAHAM GIOVANETTI, University of North Carolina at Chapel Hill and Triangle Universities Nuclear Laboratory, MAJORANA COLLABORATION — The broad energy germanium (BEGe) detector is a type of high purity germanium detector exhibiting sub-kiloelectronvolt energy thresholds while maintaining a large (~ 1 kg) detector mass. BEGe detectors show a factor ~ 5 increase in charge drift times over traditional germanium detectors, greatly improving the ability to distinguish single site events from multi-site events. This feature in a single channel detector is particularly desirable in a neutrinoless double-beta decay experiment, where it could allow a significant reduction in background events from pulse-shape discrimination and a simplification in detector array design. The MAJORANA collaboration has deployed a customized BEGe detector at Kimballton Underground Research Facility in Virginia to investigate the feasibility of using BEGe detectors in the search for neutrinoless double-beta decay in ^{76}Ge . In order to make full use of the powerful pulse-shape event discrimination of BEGe detectors, a data acquisition system (DAQ) capable of digitizing extremely low-energy signals at 100MHz is required. We present an overview of the DAQ developed for this detector.

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Graham Giovanetti
University of North Carolina at Chapel Hill and
Triangle Universities Nuclear Laboratory

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