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Development of a Calibration System for Cryogenic Light Detectors in CUPID[1] MENG LUO, YURY KOLOMENSKY, THOMAS O'DONNELL, BENJAMIN SCHMIDT, Univ of California - Berkeley, CUPID COLLABORATION
— If neutrino is a Majorana particle, it is possible to observe neutrinoless double beta decay ($0\nu\beta\beta$), whose signature is a monochromatic line at the Q-value of the decay in the energy spectrum of the two electrons. Cryogenic Underground Observatory for Rare Events (CUORE) is an experiment which aims to search for $0\nu\beta\beta$ in ^{130}Te with TeO_2 bolometers, whose background is dominated by α particles from natural radioactivity in the detector material. CUPID (CUORE Upgrade with Particle IDentification) is the next generation experiment proposed to distinguish $0\nu\beta\beta$ events from those of α particles with Cherenkov radiation. An important part of CUPID R&D is to design, build and characterize a calibration system that can generate a known amount of light and transport that light to the dilution refrigerator at mK temperatures. We describe the design, implementation and performance of a calibration system developed for bolometric light detectors. Preparation work includes researching and selecting a light source (LED). A transport system (optical fiber) was developed to direct the light to the coldest part of the dilution refrigerator. Additionally, the light yield attenuation of optical fiber at cryogenic temperatures was measured.

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