



An optimization study of MMC based light detectors for rare event search experiments

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In rare event search experiments using scintillating crystals as their major target material, light detection feature is one of the important factors for background rejection. We developed light detectors based on a metallic magnetic calorimeter (MMC) readout method. A two-inch Ge wafer is used as the absorber of the scintillation light with a phonon collector film on a side. An MMC device is employed to read the temperature increase of the film through thermal connection using gold bonding wires. In this

detector scheme, Ge absorbers and MMC sensors are prepared independently, and connected to each other in the final assembling procedure. In this patchable design of a wafer and an MMC, it is easy to make many light detector modules. We report the performance of a prototype of patchable light detectors. A series of optimization studies on the sizes of the phonon collector film and the different absorbing materials are also presented.