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Low Temperature $CaMoO_4$ Crystal Detectors for the AMoRE Project YONG-HAMB KIM, Institute for Basic Science, AMORE COLLABORATION — The AMoRE (Advanced Mo-based Rare process Experiment) project is an international experiment to search for neutrinoless double beta decay of ^{100}Mo. Excellent energy resolution and particle-type discrimination are essential to improve the experimental sensitivity in rare event search experiments of this type. Here we report performances of low temperature detectors composed of $CaMoO_4$ crystals and metallic magnetic calorimeters (MMCs). Both of heat (phonon) and light (photon) measurements were carried at tens of milli-Kelvin temperatures. The FWHM energy resolution was obtained to be 5-9 keV for environmental gamma ray peaks in the phonon channel. Clear separation (better than 15 σ) was found for alpha and electron events with heat/light ratio comparison. Pulse shape discrimination with phonon signal only was also successful with better than 15 σ of discrimination power. Moreover, signal rise-time with the MMC sensors was faster than 1 ms. It may improve rejection ability for random coincidences of two neutrinos double beta decay events that is one of major background sources for the experiment.

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