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The status of KIMS-NaI experiment at Yangyang underground laboratory

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The Korea Invisible Mass Search (KIMS) searches for WIMP dark matter signals using an array of ultra-pure NaI(Tl) crystals. The target goal of the KIMS-NaI experiment is to confirm or reject the DAMA/LIBRA claim of an annual modulation signature in similar NaI(Tl) crystals. We have studied the properties of more then ten prototype NaI(Tl) crystals, each with different internal radioisotope contaminations in order to characterize the internal backgrounds and learn how how they can be reduced. To date, we have achieved background levels of 2.5 counts/kg/keV/day in the 10 keV energy region. We have prepared a first phase of a collaborative effort with the DM-Ice group, called COSINE-100, that is using a 100 kg array of crystals from the KIMS & DM-Ice R&D projects placed in a liquid scintillator veto tank at the Yangyang underground laboratory. While this first phase operates, we will develop NaI(Tl) crystals with background levels that are below 1 counts/day/keV/kg for the next phase of the experiment. In this presentation, we will report on the current status of COSINE-100 and the status of our R&D on techniques for producing a 200 kg array of lower background crystals for the next phase of the experiment.

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