

Abstract Submitted
for the DNP10 Meeting of
The American Physical Society

Segmented CdWO₄ detector for low background experiments at DUSEL¹ DONGMING MEI, YONGCHEN SUN, ALYSSA DAY, KEENAN THOMAS, OLEG PEREVOZCHIKOV, The University of South Dakota, CUBED COLLABORATION — We propose to develop a segmented CdWO₄ scintillator array for detecting geo-neutrinos, neutrinoless double-beta, and dark matter. The detection of geo-neutrinos can shed light on the sources of the terrestrial heat flow, on the present composition, and on the origins of the Earth. The development of a new technique to detect geo-neutrinos through charge current antineutrino capture processes on ¹⁰⁶Cd is very interesting. This target allows us to detect all of geo-neutrinos from uranium, thorium, and potassium decays. When it is built, the detector can be also used to detect neutrinoless double-beta decay with ¹¹⁶Cd. Both enriched ¹⁰⁶Cd and ¹¹⁶Cd can be used to search for dark matter from the Universe. This paper will present R&D results on the energy response of gamma-rays and neutrons from three small CdWO₄ detectors.

¹NSF PHYS-0758120, NASA Sapce Grant Cosortium, and South Dakota BOR and RCC

Dongming Mei
The University of South Dakota

Date submitted: 01 Jul 2010

Electronic form version 1.4