

Abstract Submitted  
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**Development of CdWO<sub>4</sub> Crystal Detectors**<sup>1</sup> ALYSSA DAY, University of South Dakota — CdWO<sub>4</sub> scintillators have been proposed for detecting geo-neutrinos, neutrinoless double-beta decay, and dark matter. Initial research involved an energy resolution comparison of three different sized gamma ray detecting CdWO<sub>4</sub> crystals. The three crystals had diameters of 16mm and thicknesses of 5mm, 9mm, and 19mm, respectively. When using the 19mm CdWO<sub>4</sub> crystal, the energy resolution of a <sup>137</sup>Cs source resulted in 11.4% at 662 keV. A <sup>60</sup>Co source used with the same crystal resulted in 6.5% at 1173.2 keV and 8.6% at 1332.5 keV. As the sizes of the crystal decreased, a slight deterioration in energy resolution occurred with more Compton scattering in the energy spectrum. The CdWO<sub>4</sub> crystal was beneficial when measuring gamma-ray energy close to 511 keV, which is the primary signature for geo-neutrino detection with <sup>106</sup>Cd. By initially using a number of smaller crystals, small scale experiments can be run to develop and understand the calibration of these crystals. Current experiments involve using a 2 inch CdWO<sub>4</sub> crystal. It is predicted that with the use of this larger crystal, energy resolution and detection will be improved. The results of this experiment will be presented.

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