

Abstract Submitted
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Development of Handheld Detector for Neutron Tagging

WILLIAM BAKER, CAITLIN CAMPBELL, Texas A&M University — The Cryogenic Dark Matter Search (CDMS) collaboration is in need of a cheap, efficient device for neutron veto/tagging for use in conjunction with its Si/Ge detectors. We have conceived of the idea of using plastic scintillators, with Gd (neutron capture cross section = $2.6E5$ barns) loaded polyvinyltoluene and photodiodes to detect thermal neutrons. The device is light weight (<5 kg) and is shielded by polyethylene to thermalize higher energy neutrons for capture in the Gd loaded plastic. The capture by-products will be shifted to the UV-visible spectrum by the scintillating material, and then detected by high sensitivity photo-diodes. In addition, the device has the ability to discriminate against radioactive gammas, to avoid false positives. The device also provides a proof of principle for neutron veto (screening) around low background experiments, such as the CDMS experiment, where the basic principle can be applied in a multi-layer form to significantly enhance the neutron tagging so important for such low background experiments.

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