

Abstract Submitted
for the NMC16 Meeting of
The American Physical Society

The Effects of Doping to Create PN and PIN CdZnTe Diodes for CdZnTe Gamma Detectors¹ STEPHANIE MORRIS, LARS VOSS, TIM GRAFF, STEVE PAYNE, Lawrence Livermore National Laboratory (LLNL), ARNOLD BURGER, Fisk University — Bulk leakage and surface leakage current remain as issues for the deployment of CdZnTe gamma detectors. Electronic noise dominates at important low gamma energies, and surface and bulk leakage current limits the performance of the coplanar grid readout. Through the use of PN and PIN diodes, both surface and bulk leakage currents can be reduced. This was observed through the doping of a CdZnTe gamma detector with Aluminum and Phosphorus by means of ion implantation at elevated temperatures. For this project, in particular, other elements were used as dopants for CdZnTe gamma detectors to observe whether such elements serve as better bulk and surface leakage current reduction agents. As a result, initial current voltage measurements of dopant implanted CdZnTe gamma detectors indicated that boron and aluminum are highly effective dopants. Thus, for future testing plans, a boron implanted CdZnTe gamma detector performance measurement is of priority.

¹The Defense Threat Reduction Agency, Nuclear Technologies Detection Division

Stephanie Morris
Fisk University

Date submitted: 18 Aug 2016

Electronic form version 1.4