

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Crystal growth and detector performance of large size high-purity Ge crystals GUOJIAN WANG, Department of Physics, University of South Dakota, MARK AMMAN, Ernest Orlando Lawrence Berkeley National Laboratory, HAO MEI, DONGMING MEI, Department of Physics, University of South Dakota, KLAUS IRMSCHER, Leibniz Institute for Crystal Growth, YUTONG GUAN, GANG YANG, Department of Physics, University of South Dakota — High-purity germanium crystals with 12 cm in diameter were grown in a hydrogen atmosphere using the Czochralski method. The dislocation density of the crystals was determined to be in the range of 2000 - 4200 cm^{-2} , which meets a requirement for use as a radiation detector. The axial and radial distributions of impurities in the crystals were measured by Hall effect and Photo-thermal ionization spectroscopy (PTIS). Two detectors were also fabricated from one of the crystals with different techniques and then evaluated for electrical and spectral performance. Measurements of gamma-ray spectra from ^{137}Cs , ^{241}Am and ^{60}Co sources demonstrate that the detectors have excellent energy resolution. Keywords: High-purity germanium crystal, Czochralski method This work is supported by DOE grant DE-FG02-10ER46709 and the state of South Dakota.

Guojian Wang
Univ of South Dakota

Date submitted: 13 Nov 2014

Electronic form version 1.4