

Abstract Submitted
for the APR08 Meeting of
The American Physical Society

P-type Modified Electrode Germanium Detector Impurity Profiles¹ JEREMY KEPHART, Pacific Northwest National Laboratory — Germanium detectors with unprecedented capabilities are needed for detecting ultra-rare events in future neutrinoless double-beta decay experiments, searches for dark matter, environmental monitoring programs, national security applications, and potentially neutrino astrophysics. An ideal detector would combine ultra-low background capabilities, minimal electronic instrumentation, extremely low energy threshold, and the ability to perform event reconstruction to determine the interaction type or the spatial distribution of ionization following an interaction. A germanium detector with a special, very low capacitance, contact geometry and presumably a deliberately contrived impurity profile could provide all these capabilities. We present an analysis of the detector impurity concentration profiles and their impact on the depletion voltage, capacitance and charge collection times for such detectors.

¹Pacific Northwest National Laboratory is managed by Battelle Memorial Institute for the Department of Energy under contracts AC76RLO 1830.

Jeremy Kephart
Pacific Northwest National Laboratory

Date submitted: 11 Jan 2008

Electronic form version 1.4