Abstract Submitted
for the APR06 Meeting of
The American Physical Society

**Pulse Shape and Segmentation Analysis in Germanium Detectors for Double-Beta Decay** VICTOR M. GEHMAN, Los Alamos National Laboratory/University of Washington, STEVEN ELLIOTT, DONGMING MEI, Los Alamos National Laboratory, ALBERT YOUNG, HENNING BACK, North Carolina State University, MAJORANA COLLABORATION — The Majorana Project will endeavor to provide direct limits on the effective Majorana mass of the electron neutrino through the measurement of neutrinoless double-beta decay in $^{76}$Ge. Our goal is an experiment sensitive to the effective neutrino mass at the level of a few hundred meV scalable to a sensitivity of approximately 50 meV. One technique the Majorana Project will exploit to separate signal from background events is the combination of pulse shape analysis and detector segmentation. This background reduction is possible because double-beta events are very spatially localized (or single-site) in a germanium detector array, whereas likely backgrounds will be more spatially extended (or multi-site). In this report, we present a series of experiments using double-escape peaks as surrogate single-site events and full-energy $\gamma$ peaks as surrogate multi-site events. These data were taken at LANL using a "CLOVER" detector (an array of four 800g, two-fold segmented germanium detectors) with a $^{56}$Co source. We will also discuss a similar experiment performed using the Free Electron Laser at TUNL and SEGA (a twelve-fold segmented detector enriched to 86% in $^{76}$Ge).

Victor M. Gehman
Los Alamos National Laboratory/University of Washington

Date submitted: 13 Jan 2006 Electronic form version 1.4