Abstract Submitted
for the APR11 Meeting of
The American Physical Society

LGB Crystals in Plastic for Anti-Neutrino Detection and ^{3}He Replacement[1] KAREEM KAZKAZ, NATHANIEL BOWDEN, LLNL, PETER NELSON[2], Naval Postgraduate School, MARISA PEDRETTI, LLNL — Scintillating lithium gadolinium borate (LGB) crystals have a high neutron capture cross-section and a long scintillation decay constant. By mixing small shards into a clear plastic matrix, neutrons can be moderated to allow for easier capture within the high capture cross-section crystal. If the plastic is scintillating, the combination can be used to measure an anti-neutrino flux. A non-scintillating plastic makes for a possible solid-state replacement for He-3 tubes. We present experimental data from both kinds of detector, with a focus on neutron efficiency and gamma identification or rejection. We explore Monte Carlo models to determine the optimal LGB content, and present preliminary results from using pulse shape analysis to reduce systematic effects.

[1]This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory in part under Contract W-7405-Eng-48 and in part under Contract DE-AC52-07NA27344. LLNL-PRES-XXXXXX.
[2]Currently at West Point

Kareem Kazkaz
LLNL

Date submitted: 16 Jan 2011 Electronic form version 1.4