Abstract Submitted
for the APR17 Meeting of
The American Physical Society

^{37}Ar Calibration of the Large Underground Xenon Experiment ELIZABETH BOULTON, Yale University, LUX COLLABORATION COLLABORATION — The LUX collaboration released its 332 live-day WIMP search result in June 2016. Besides WIMPs, there are several other rare particles to search for using two-phase xenon detectors, such as axion-like pseudoscalars, axions, and electrophilic dark matter. All of these proposed particles interact with xenon via electron recoils at low energy. Also, the neutrino magnetic moment can be searched for by examining the rates of neutrino-electron scattering at low energy. Therefore, understanding xenon's response in this low-energy regime is vitally important. ^{37}Ar is an ideal source for calibrating a detector at these low energies, because it decays via electron capture (EC) and releases x-rays at two energies: 2.8 keV due to EC from the K-shell and 0.27 keV due to EC from the L-shell. Additionally, ^{37}Ar can be used to precisely study recombination fluctuations at a specific energy in the WIMP region of interest. Recombination fluctuations limit electron recoil discrimination efficiency, so understanding how these fluctuations change with electric drift field is important to all LUX analysis. This talk will explain the motivation, creation, deployment, and results of the ^{37}Ar source in LUX over a wide range of drift fields.

Elizabeth Boulton
Yale University

Date submitted: 30 Sep 2016 Electronic form version 1.4