

Abstract Submitted  
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**Nuclear Recoil Calibration in the LUX Detector Down to 0.45 keV for Light Yield and 0.27 keV for Charge Yield Using a Pulsed D-D Neutron Generator** DONGQING HUANG, University of Michigan / Brown University, LUX COLLABORATION — We report an improved nuclear recoil calibration in the LUX detector in situ at the Sanford Underground Research Facility using neutron events from a pulsed Adelphi Deuterium-Deuterium (DD) generator. The calibration incorporates neutron pulses with an instantaneous flux of ( $2.8 \times 10^8$  neutrons/sec) with a narrow width (20 us) at a frequency of 250 Hz. We have measured the absolute rates of individual nuclear recoil (NR) events in the 250 kg liquid Xe TPC with ionization signals at and above 2 extracted electrons and with scintillation signals of zero, one or more detected photons. This is the first time a calibration measurement has been made of the absolute event rates of charge-only S2 events (no scintillation photons detected) in a Xe TPC and provides an important probe of the ultra-low energy measurement of the charge yields in LXe. This technique provides direct measurements of scintillation (Ly) and charge (Qy) yields down to 0.45 keVnr and 0.27 keVnr, respectively. New calibration results on ultra-low energy nuclear recoil yields are crucial to determine physics search sensitivities for large mass LXe TPCs (LZ experiment) for low mass WIMPs ( $\lesssim 10$  GeV) and for coherent neutrino scattering (e.g.  $^8\text{B}$  solar neutrino detection).

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