

Abstract Submitted  
for the APR16 Meeting of  
The American Physical Society

**Liquid-purity monitor for the LUX-ZEPLIN dark matter search**

AARON MANALAYSAY, University of California Davis, LUX-ZEPLIN COLLABORATION — The LUX-ZEPLIN (LZ) experiment will be the first liquid-xenon (LXe) dark matter search to feature a multi-tonne fiducial target. Drawing on the lessons learned in the LUX and ZEPLIN experiments, this next step will probe dark-matter candidates with unprecedented sensitivity. As these LXe detectors have grown larger, so too has the distance over which ionization electrons (from particle interactions) must be drifted through the liquid. Because of this, even minute levels of electronegative impurities can significantly attenuate the ionization signal, and must therefore be closely monitored. I will present the concept of a liquid-purity monitor which uses new and novel techniques, including state-of-the-art UV LEDs and low-work-function materials, and will measure levels of impurities in LZ's liquid circulation line in real time. This device will provide vital supplemental data to the roughly weekly in-situ purity measurements carried out within the detector's active volume, will greatly improve the resolution of the ionization channel in this detector, and will yield instant feedback in response to changing detector conditions.

Aaron Manalaysay  
University of California Davis

Date submitted: 07 Jan 2016

Electronic form version 1.4