

# Update on the Cathode High Voltage Research and Development for LUX-ZEPLIN

*Saturday, 2 December 2017 11:50 (20 minutes)*

The LUX-ZEPLIN (LZ) experiment is a 7-ton active mass dual phase xenon time projection chamber that will be used to perform a direct search for Weakly Interacting Massive Particles (WIMPs), a dark matter candidate, as well as perform other physics searches. Incoming particles (such as a dark matter WIMP) interact with the xenon nuclei or electrons, inducing ionization and scintillation. An applied electric field guides the ionized electrons to a region of gaseous xenon across 1.456 meters of highly pure liquid xenon. PMT arrays on the top and bottom of the chamber detect the scintillation light. An even stronger field extracts the electrons from the liquid-gas interface, producing secondary electroluminescence delayed by the drift time (maximum ~800 us). The electric field within the drift region is to have a strength of 0.65 kV/cm. The maintenance of this field without causing either breakdown or trace light is a design challenge. A significant part of that challenge comes from the method of delivering the high voltage (-100 kV) through a feedthrough from outside the TPC to the cathode, without spoiling purity of the xenon, drastically increasing the radioactive background, or creating spurious light. Here I present the status of LZ's Cathode High Voltage feedthrough (CHV) research and design project.

## Session

Works in Progress (15+5 min)

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**Session Classification:** Works in Progress