



Contribution ID: 214

Type: **Talk**

LUX: A dual phase Xe TPC for direct dark matter detection

Friday 15 February 2013 12:10 (20 minutes)

Direct detection of WIMP dark matter (DM) requires highly sensitive, ultra-low background detectors, which maximize the target mass. The two-phase Time Projection Chamber (TPC) technique, employed by the Large Underground Xenon (LUX) detector, takes advantage of the anti-correlated scintillation and ionization properties of liquid Xe to achieve a projected sensitivity of DM-nucleon cross section $< 2 \times 10^{-46} \text{cm}^2$ (for 60 GeV WIMPs). In order to realize this, it employs a large water shield, careful radio-screening of materials, and extensive Xe purification, thereby lowering background. Results from surface operation of the LUX detector and preliminary results from underground commissioning will be presented. Critical figures of merit, such as electron drift lifetime, light collection efficiency, and discrimination power, will be discussed.

quote your primary experiment

LUX

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Session Classification: Plenary 4