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LZ: A 2nd Generation Dark Matter Direct-search Experiment

Wednesday, 11 September 2013 14:00 (20 minutes)

The LZ collaboration has proposed a 2nd generation direct dark matter search experiment, which builds on the experience gained with the LUX and ZEPLIN series of experiments on the two-phase xenon TPC technique. It features an active target volume of ~7 tonnes and a robust 3-layer shield system consisting of a xenon skin volume and a liquid scintillator veto, embedded in the existing 6m diameter water tank at the 4850' level of the Sanford Underground Research Facility. We have developed a novel design for the liquefaction, recirculation and purification for this unprecedented large volume of xenon. Our studies of backgrounds are comprehensive and predict an approximately 6 tonne fiducial volume, in which the dominant electron and nuclear recoil backgrounds are from astrophysical neutrinos. The projected sensitivity for a 1,000 day running period for the WIMP-nucleon cross section is below 2.5x10^-48 cm^2 at a WIMP mass of 50 GeV. We will present some details of the advanced design of LZ, the background model, and our physics goals.

Primary author: Prof. TRIPATHI, Mani (UC Davis)

Presenter: Prof. TRIPATHI, Mani (UC Davis)

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