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The LZ Dark Matter Experiment ETHAN BERNARD, Yale University, LZ COLLABORATION — Astrophysical and cosmological observations show that dark matter is concentrated in halos around galaxies and is approximately five times more abundant than baryonic matter. Dark matter has evaded direct detection despite a series of increasingly sensitive experiments. The LZ (LUX-ZEPLIN) experiment will use a two-phase liquid-xenon time projection chamber to search for elastic scattering of xenon nuclei by WIMP (weakly interactive massive particle) dark matter. The detector will contain seven tons of liquid xenon shielded by an active organic scintillator veto and a water tank within the Sanford Underground Research Facility (SURF) in Lead, South Dakota. The LZ detector scales up the demonstrated light-sensing, cryogenic, radiopurity and shielding technologies of the LUX experiment. Active shielding, position fiducialization, radiopurity control and signal discrimination will reduce backgrounds to levels subdominant to solar neutrino scattering. This experiment will reach a sensitivity to the WIMP-nucleon spin-independent cross section approaching $\sim 2 \cdot 10^{-48}\text{cm}^2$ for a 50 GeV WIMP mass, which is about three orders of magnitude smaller than current limits.

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