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Xenon Purification Research and Development for the LZ Dark Matter Experiment KATHERIN PECH, Case Western Reserve University, LZ COLLABORATION — The LZ Experiment is a next generation dark matter detector based on the current LUX detector design, with a 7-ton active volume. Although many research and development breakthroughs were achieved for the 350 kg LUX detector, the large volume scaling required for LZ presents a new set of design challenges that need to be overcome. Because the search for WIMP-like dark matter requires ultra low background experiments, the xenon target material in the LZ detector must meet purity specifications beyond what is commercially available. This challenge is two-fold. The xenon must contain extremely low amounts of electronegative impurities such as oxygen, which attenuate the charge signal. Additionally, it must also have very little of the inert isotope Kr-85, a beta-emitter that can obscure the dark matter signal in the detector volume. The purity requirements for the LUX experiment have been achieved, but the factor of 20 scaling in volume for LZ and increased demands for sensitivity mean that new research and development work must be done to increase our xenon purification capabilities. This talk will focus on the efforts being done at Case Western Reserve University to meet these strict purity requirements for the LZ Experiment.

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