Abstract Submitted
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LUX_0.1 Prototype Results: Cryogenics and Circulation ADAM BRADLEY, Case Western Reserve University, LUX COLLABORATION — LUX is a new dark matter direct detection experiment to be carried out at the Sanford Lab, the renewed underground facility at the Homestake mine in Lead, SD. The detector's large size supports effective internal shielding from natural radioactivity of the surrounding materials and environment. The LUX detector consists of a cylindrical vessel containing 350 kg of liquid xenon (LXe) cooled down using a novel cryogenic system. We tested a small-scale four PMT prototype utilizing over 300 gm of active xenon, installed in the full-sized cryostat. We report the efficiency of a unique internal heat exchanger with standard gas phase purification using a heated getter, which allows for very high flow purification without requiring large cooling power, as well as the efficiency of a thermosyphon-based cooling system. Such systems are required for multi-ton scale up.

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