Abstract Submitted
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Dark matter and mini-CLEAN JAMES NIKKEL, HUGH LIPPINCOTT, DANIEL MCKINSEY, Yale University, ANDREW HIME, DONGMING MEI, KEITH RIELAGE, LAURA STONEHILL, LANL, ED KEARNS, DAN GASTLER, Boston University, KEVIN COAKLEY, NIST, MARK BOULAY, Queen's University, CLEAN COLLABORATION — Because liquid neon is easily purified, has no intrinsic radioactivity, and scintillates brightly in response to ionizing radiation, it is a promising material for the detection of rare low-energy events. The mini-CLEAN experiment will contain on active mass of approximately 100 kg of liquid neon viewed by 32 photomultiplier tubes and will serve as a prototype for the 10-100 ton CLEAN detector. Mini-CLEAN will be used to test the practicality of liquid neon as a scintillation material for neutrino detection. Additionally, the liquid neon can be replaced with liquid argon to provide improved sensitivity to dark matter in the form of weakly interacting massive particles. The ability to exchange the two cryogens, with different sensitivities to dark matter and fast neutrons, will allow the two event types to be accurately characterized. Radioactive backgrounds from gamma rays will be rejected through pulse-shape discrimination, which has been shown to be highly efficient in both liquid neon and liquid argon.

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