

Abstract Submitted
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A measurement on proportional scintillation properties in liquid xenon JUNJI NAGANOMA, Rice Univ — I present a property measurement on proportional scintillation in liquid xenon (LXe). LXe time projection chamber (TPC) has superior features for the direct detections of weakly interacting massive particle (WIMP) due to its high density, usability of scintillation and ionization signals for particle identification, capability of position reconstruction, relatively higher WIMP cross section, and sensitivity to spin-independent and spin-dependent interactions. Currently XENON and LUX collaborations utilize liquid-gas double-phase Xe detectors, denser liquid phase is for WIMP interaction, and gas phase is for ionization signal detection. There are some technical difficulties for future larger size double-phase Xe detector, such as precise liquid level control and high cathode voltage to keep 1kV/cm electric field. Single phase TPC using proportional scintillation in LXe can overcome these difficulties since liquid level control is not necessary and cathode voltage can be reduced while keeping the same electric field by arranging electrodes properly. To test the feasibility of the concept we measured the properties of proportional scintillation in LXe using thin wire and gas electron multiplier at Columbia University Nevis labs.

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