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**Light dark matter search in XENON1T using single- and few-electron ionization-only signals** AMANDA DEPOIAN, Purdue University, XENON COLLABORATION — The energy threshold of liquid xenon detectors is driven by the requirements of observing a scintillation signal as well as a large ionization signal. Observing both allows powerful background rejection but limits the sensitivity below  $O(10\text{GeV})$ . In the first search from XENON1T for light dark matter, events using only the ionization signal were used to set limits down to WIMP masses of 3 GeV but was limited to an ionization signal of 5 electrons due to single- and few-electron backgrounds that were not well understood. A dedicated analysis was performed to understand these backgrounds and event selections were developed to mitigate them. In this talk, we discuss details of the analysis and present its status in a search for light dark matter signals using only the single- and few-electron ionization signals in the XENON1T detector and discuss the implications they have for XENONnT and supernova neutrino detection.

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