

Abstract Submitted
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Atom counting system to measure ultra-low Kr-85 contamination in liquid xenon dark matter detectors TAE HYUN YOON, ANDRE LOOSE, LUKE GOETZKE, ELENA APRILE, TANYA ZELEVINSKY, Columbia University, ATTA TEAM — The XENON experiment aims at the direct detection of dark matter in the form of Weakly Interacting Massive Particles (WIMPs) via their elastic scattering off Xe nuclei. To achieve the required sensitivity, it is necessary to suppress Kr contamination of Xe which causes background events in Xe targets through Kr-85 beta decay. Contamination below the part per trillion level is required for the next generation targets. Magneto-optical techniques are used to cool and trap metastable Kr atoms from a RF plasma discharge. Fluorescence from single trapped Kr atoms can be detected with an avalanche photodiode (APD). The cold-atom apparatus was initially tested with Ar to avoid contamination by Kr. An estimated Kr contamination level of XENON 100 and the experimental sensitivity projections will be presented.

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