

Abstract Submitted  
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**ATTA Device for Measuring Trace Kr Contamination in Xenon Dark Matter Detectors** LUKE GOETZKE, TAE HYUN YOON, ANDRE LOOSE, ELENA APRILE, TANYA ZELEVINSKY, Columbia University — The XENON dark matter experiments search for low-energy elastic scattering events of Weakly Interacting Massive Particles (WIMPs) off Xe nuclei. For Xe targets and other noble liquids used in rare process searches, Kr contamination contributes background events through the beta decay of long-lived radioactive Kr-85. To achieve the sensitivity required of the next generation of dark matter detectors, the Kr contamination must be reduced to less than one part per trillion (ppt). We have developed an Atom Trap Trace Analysis (ATTA) device to measure Kr/Xe at the ppt level. Metastable Kr-84 is cooled and trapped in a magneto-optical trap, and imaged with a sensitive photodetector. Since Ar and Kr have similar wavelengths, the apparatus has been initially tested with Ar to avoid contamination. Results from tests with Ar and single atom detection with Kr will be presented.

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