

Abstract Submitted
for the 4CF09 Meeting of
The American Physical Society

Application of Multiphoton Ionization of Liquid Xenon for Purity Measurements¹ JULIO CESAR BENITEZ MEDINA, KENDY HALL, WILLIAM FAIRBANK, Colorado State University — Detection of fluorescence from single Ba^+ daughter ions in liquid xenon is a potential key method of background discrimination in the Enriched Xenon Observatory (EXO) double beta decay experiment. An important requirement is to have ultrapure liquid in order to ensure Ba^+ ion survival for many seconds. To measure the purity of liquid Xenon we produce electrons using a 355 nm and 266nm Nd-YAG pulsed laser. By varying the laser energy, we have demonstrated that these are two- and three-photon ionization processes, respectively. As the electrons travel in the liquid some may be lost by attachment to impurities. By measuring the fraction of electrons that survive, we can determine the purity of the liquid. Having a focused beam allows us to select where the electrons are created.

¹Supported by DOE under Grant No. DE-FG02-03ER41255.

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Date submitted: 29 Sep 2009

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