

Abstract Submitted
for the 4CF13 Meeting of
The American Physical Society

Measurement of the mobility of barium ions in xenon gas and implications for a next generation ^{136}Xe double beta decay experiment in high pressure gas¹ JULIO BENITEZ-MEDINA, WILLIAM FAIRBANK, Colorado State University — The Enriched Xenon Observatory (EXO) is an experiment which aims to observe the neutrinoless double beta decay of ^{136}Xe . The measurement of this decay would give information about the absolute neutrino mass. Since this is a very rare decay, the ability to reject background events by detecting the barium ion daughter from the double beta decay would be a major advantage. The barium ions may be detected by laser induced fluorescence spectroscopy. One of our efforts in “barium tagging” at Colorado State University has been the fluorescence detection of barium ions in xenon gas. It is important to know how fast the barium ions travel in xenon gas. The results of mobility measurements of barium in xenon gas will be presented. The variation of mobility with xenon gas pressure suggests that some molecular ions are formed when barium ions interact with xenon gas at high pressures. The results indicate that the percentage of molecular ions is greater at higher pressures. The results are of interest for a next generation double beta decay experiment, for schemes involving a ^{136}Xe gas detector.

¹Work supported by DOE DE-FG02-03ER41255.

Julio Benitez-Medina
Colorado State University

Date submitted: 20 Sep 2013

Electronic form version 1.4