

Abstract Submitted  
for the APR11 Meeting of  
The American Physical Society

**Development of Resonance Ionization Spectroscopy for highly efficient transport of single ions** MARIA MONTERO DIEZ, KARL TWELKER, Stanford University, EXO COLLABORATION — Resonance Ionization Spectroscopy (RIS) has been shown to be a highly efficient method of selective ionization. As R&D for the Enriched Xenon Observatory (EXO) experiment, we are investigating RIS as part of a high-efficiency single ion transport method to retrieve Barium ions produced in double beta decay of Xenon-136 and inject them in a ion trap where they are identified via optical spectroscopy. This Ba-tagging technique would substantially reduce the background due to radioactive impurities in very large double-beta decay experiments. RIS is used to re-ionize the Ba atoms after they are desorbed from the substrate on which they had been captured. The current device utilizes our radionuclide-driven single-ion source in order to push the technology to very high efficiency with small numbers of ions.

Maria Montero Diez  
Stanford University

Date submitted: 14 Jan 2011

Electronic form version 1.4