

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.

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Date submitted: 14 Jan 2011

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