

Abstract Submitted
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First Penning Trap Mass Measurements of Rare Isotopes produced by Fast Beam Fragmentation G. BOLLEN, NSCL/MSU, D. DAVIES, M. FACINA, J. HUIKARI, E. KWAN, A. PRINKE, D.J. MORRISSEY, R. RINGLE, J. SAVORY, P. SCHURY, S. SCHWARZ, C. SUMITHRARACHCHI, T. SUN — LEBIT is a facility designed for Penning trap mass measurements on rare isotope produced by fast beam fragmentation. LEBIT has now been used to perform a precision mass measurement of the super-allowed β -emitter ^{38}Ca . For this purpose ^{38}Ca was produced via fragmentation of a $^{93}\text{MeV } ^{40}\text{Ca}$ beam. After appropriate degrading of its energy the ^{38}Ca beam was stopped in the NSCL gas cell. A low energy beam was extracted in the form of doubly-charged $^{38}\text{Ca}(\text{H}_2\text{O})_n$ molecules. A RFQ mass filter was used to select $(^{38}\text{Ca}-\text{H}_2\text{O})^{2+}$ ions, which were transported into the gas-filled RFQ beam accumulator and buncher of LEBIT. Here the water was stripped off in collisions with Ne buffer gas. The resulting $^{38}\text{Ca}^{2+}$ ions were then transferred into LEBIT's 9.4T Penning trap mass spectrometer, where their mass was measured. This first direct measurement of the mass of ^{38}Ca provides an improved mass value, making this isotope more suitable for contributing to the test of the conserved vector current hypothesis. The experiment is also the first successful demonstration that rare isotopes produced by beam fragmentation at energies of 100MeV/u can be slowed down and prepared such that precision experiments with low-energy beams are possible.

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