

Abstract Submitted
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Advancing Penning trap mass spectrometry of rare isotopes at the LEBIT facility¹ M. REDSHAW, Central Michigan University, G. BOLLEN, Facility for Rare Isotope Beams, R. RINGLE, S. SCHWARZ, K. GULYUZ, National Superconducting Cyclotron Laboratory, M. EIBACH, Ernst-Moritz-Arndt-Universität, A. HAMAKER, C. IZZO, D. PUENTES, J. SURBROOK, I. YANDOW, Michigan State University, R. SANDLER, Central Michigan University — The Low-Energy Beam and Ion Trap (LEBIT) facility at the National Superconducting Cyclotron Laboratory (NSCL) remains the only Penning trap mass spectrometry (PTMS) facility to utilize rare isotopes produced via projectile fragmentation. The fast, chemically insensitive rare isotope production method combined with precise and accurate PTMS techniques have enabled mass measurements of short-lived isotopes with precisions of <10 ppb across the nuclear chart with applications to fundamental interactions, nuclear structure, and nuclear astrophysics. In order to expand the experimental reach of PTMS to nuclides delivered at very low rates, the new Single Ion Penning Trap (SIPT) has been built. SIPT utilizes a cryogenic trap and electronic detection circuit for narrowband detection and cyclotron frequency measurement of a single ion via its induced image currents. SIPT will be used to perform high-impact measurements on isotopes delivered at rates as low as one ion per day. In combination with the existing 9.4-T time-of-flight mass spectrometer, the 7-T SIPT system will make optimal use of the wide range of isotopes that will be available when FRIB comes online.

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