

Abstract Submitted
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A miniature Penning trap for continuous magnetic field monitoring at the LEBIT Penning trap mass spectrometry facility MATTHEW REDSHAW, DAVID LINCOLN, RYAN RINGLE, STEFAN SCHWARZ, NSCL, GEORG BOLLEN, NSCL/FRIB — At the LEBIT Penning trap mass spectrometry facility, the mass to charge ratio of an ion is determined by measuring its cyclotron frequency in a strong magnetic field using a time-of-flight technique, which typically requires at least 50 ions for a single frequency measurement. The magnetic field strength is calibrated by interleaving frequency measurements on the rare isotope with measurements on a stable reference ion. However, this takes up valuable beam time and does not account for non-linear drifts in the magnetic field. These effects become more significant for rare isotopes with low production rates, where a single frequency measurement can take several hours or more. As an alternative scheme for monitoring variations in the magnetic field, we are developing an additional, miniature Penning trap (MiniTrap) to be used as a magnetometer. This MiniTrap can be operated independently from, and simultaneous to the rare isotope measurement. The cyclotron frequency of a small cloud of ions confined in the MiniTrap will be monitored via image charge detection using a Fourier transform technique. In this talk I will present the results of developmental and design studies for MiniTrap, and give an update on the status of the project.

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