

Abstract Submitted  
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**Ion Current as a Precise Measure of the Loading Rate of a Magneto-Optical Trap**<sup>1</sup> WEI JIANG, KEVIN BAILEY, Argonne National Laboratory, ZHENG-TIAN LU, Argonne National Laboratory; University of Chicago, PETER MUELLER, THOMAS O'CONNOR, Argonne National Laboratory, ROLAND PURTSCHERT, University of Bern — We have demonstrated that the ion current resulting from collisions between metastable krypton atoms in a magneto-optical trap can be used to precisely measure the trap loading rate. We measured both the ion current of the abundant isotope  $^{83}\text{Kr}$  (isotopic abundance = 11%) and the single-atom counting rate of the rare isotope  $^{85}\text{Kr}$  (isotopic abundance  $\sim 1 \times 10^{-11}$ ), and found the two quantities to be proportional at a precision level of 0.9%. This work results in a significant improvement in using the magneto-optical trap as an analytical tool for noble-gas isotope ratio measurements, and will benefit both atomic physics studies and applications in the earth sciences. Reference: *Opt. Lett.* **39**, 409 (2014).

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