

Abstract Submitted
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Open-Channel fluorescence imaging of atoms in a high-gradient magnetic guide¹ RAHUL MHASKAR, SPENCER OLSON, GEORG RAITHEL, FOCUS Center, Department of Physics, University of Michigan Ann Arbor, Michigan 48109. — We present a novel method of imaging atomic distributions in high-gradient trapping fields. A probe laser tuned to an open transition is used to illuminate the atomic distribution. The resultant fluorescence yield per atom is largely fixed throughout the trap volume, independent of the trapping field. This enables a reliable conversion of fluorescence images into atomic-density profiles. The method is applied to measure distributions of ⁸⁷Rb atoms in a high-gradient (2.7 kGauss/cm) magnetic atom guide. We characterize the parameters for which the open-transition imaging method performs best. Quantum Monte Carlo simulations are used to test the underlying assumptions of the method. The method can be applied to image cold atoms trapped by permanent fields, continuously trapped or guided atoms, and species that do not have a suitable closed transition.

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