

Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Optical trapping and cooling of ^{87}Rb with a 1550 nm fiber laser

ABRAHAM OLSON, PING WANG, ROBERT NIFFENEGGER, QIANLI MA, YONG P. CHEN, Purdue University — We have investigated optical trapping and cooling of ^{87}Rb with a 1550nm single-frequency, fiber laser. We present a technique to map out the 3D spatial intensity profile of an optical dipole trap by imaging a background, untrapped cold atomic cloud. The 1550nm laser causes a strong AC Stark shift [1] of the excited state ($5\text{P}_{3/2}$) of ^{87}Rb which we image by driving the D2 transition. Such Stark tomography allows us to use an untrapped cloud of ^{87}Rb to characterize the potential trap depth, beam waist, trapping frequency, beam quality factor (M^2), and astigmatism of the trap beam. We also investigated schemes for all- optical evaporative cooling of trapped atoms to quantum degeneracy.

Abraham Olson
Purdue University

Date submitted: 04 Feb 2011

Electronic form version 1.4