

Abstract Submitted
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Loading and high efficiency evaporative cooling to BEC with a MACRO-FORT ABRAHAM OLSON, ROBERT NIFFENEGGER, YONG P. CHEN, Purdue University — We present modeling and experimental results for efficient evaporative cooling in all-optical BEC experiments. By employing a misaligned crossed-beam far off-resonance optical dipole trap (MACRO-FORT [1]) we achieve decreasing trap depth with increasing average trap frequency during the evaporative cooling process, allowing highly efficient runaway evaporation. This method is effective even with a low initial atom density, and it has experimentally allowed us to create BECs of ^{87}Rb starting from only a few 10^5 atoms initially in the optical trap before evaporation. We have also studied the direct loading of ^{87}Rb atoms from a MOT to our 1550nm optical trap, where the atomic D2 transition has a significant AC Stark shift.

[1] J.-F. Clement *et al.*, Phys. Rev. A **79**, 061406(R) (2009)

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