Enhanced loading of single ^{87}Rb atoms into optical microtraps using lambda-enhanced gray molasses

T. Thiele,[1,*] M. O. Brown,[1] C. Kiehl,[1] and C. A. Regal[1]

[1] *JILA, National Institute of Standards and Technology and University of Colorado, and Department of Physics, University of Colorado, Boulder, Colorado 80309, USA*

We achieve enhanced loading of xx.x% of single ^{87}Rb atoms into tightly confined optical microtraps by using a lambda-enhanced grey-molasses technique. The optical microtraps have a depth of 0.5mK, substantially lower than the depth required for other enhanced loading techniques. When further enhanced with real-time rearranging techniques, which we also demonstrate, this technique will allow for the creation of larger arrays of uniformly filled aotms than previous techniques have alowed.

- [History / Motivation]
- [Enhanced Loading]
  - [Methods]
    - General Experiment Procedure
    - Fixed Cooling Parameters
      - Cooling Power
      - Cooling Time
      - Repump Power
    - Fig: [Level Diagram]
    - Fig: [Experiment Diagram, for both enhanced loading & rearrangement stuffs]
      - Show laser lines
      - Show Control Scheme
  - [Results]
    - [The Bottom Line: What loading rate can we achieve?]
    - [Temperatures]
    - [Loading Rate as a function of...]
      - [Trap Depth]
      - [Detuning]
      - [Other?]
- [Rearranging]
  - [Methods]
  - [Results]
- [Conclusions]

Supplementary information

ACKNOWLEDGMENTS