

Abstract Submitted
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Analysis of Optical Bichromatic and Polychromatic Forces on Atoms and Molecules¹ LELAND ALDRIDGE, SCOTT GALICA, TONY LE, E.E. EYLER, University of Connecticut — Previous work with optical bichromatic forces (BCFs) has demonstrated their ability to rapidly decelerate and cool atomic beams, and we have recently proposed extensions to molecules and multi-color beams.² We have performed extensive numerical simulations of bichromatic and polychromatic laser forces on a two-level system, including sensitivity to variations of parameters such as intensity, beam balance, and atomic velocity. We discuss progress on multi-level simulations, which are essential for designing optimal deceleration and cooling of molecules. We also discuss ongoing experimental tests of polychromatic forces on helium and of bichromatic forces on molecules, using the $B \leftrightarrow X$ transition in CaF as a test case.

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²M. A. Chieda and E. E. Eyler, Phys. Rev. A **84**, 063401 (2011); S. E. Galica, L. Aldridge, and E. E. Eyler, Phys. Rev. A **88**, 043418(2013).

Leland Aldridge
University of Connecticut

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