

Abstract Submitted
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Rapid Molecular Transport in Pulsed Optical Lattices PETER BARKER, RAY FULTON, ALEXIS BISHOP, Heriot-Watt University, MIKHAIL SHNEIDER, Princeton University — We show that molecules can be rapidly transported using large optical lattices (500 K) using high intensity (2×10^{16} W/m²) far off resonant pulsed optical lattices. Using this method we have decelerated benzene molecules from a cold (2.3 K) molecular beam from 320 m/s to 243 m/s, exceeding earlier results using a single focused Gaussian beam^[1]. This corresponds to an average deceleration of 10^9 g, reducing the translational energy of the benzene molecules by 48%. These results indicate that if the field is rapidly switched-off a significant fraction of the molecules could be brought to rest in a single 2 ns pulse. References:
[1] R. Fulton, A.I. Bishop, P.F. Barker. Phys. Rev. Lett. **93**, 243004 (2004)

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