

Abstract Submitted
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1D scattering experiments with ultra-cold atoms: transient enhancement of high momenta¹ ROCKSON CHANG, University of Toronto, CHRIS ELLENOR, MIRCO SIERCKE, SHREYAS POTNIS, AEPHRAIM STEINBERG — During the scattering of a particle from a repulsive potential, the particle can exhibit an enhancement of high momentum components. This effect is transient in the sense that it only exists when there is an overlap between the particle's wavefunction and the scattering potential, and is inherently a quantum mechanical phenomenon. This effect has been shown to be strongest for scattering potentials that are weak such that the wavepacket is entirely transmitted [1]. In our experiment we use an ultra-cold gas interacting with a thin optical dipole barrier to observe this effect. If time permits, we will discuss experiments in progress to investigate tunneling of our ultra-cold gas in 1D.

[1] S. Brouard and J. G. Muga , Phys. Rev. Lett. **81**, 2621-2625 (1998)

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