

Abstract Submitted
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Tunnelling and Reflection of Matter-waves by a Repulsive Barrier¹ JASON NGUYEN, PAUL DYKE, ALINA BLINOVA, HENRY LUO, RANDALL HULET, Rice University — Ultracold atomic systems provide us with a unique opportunity to study matter-waves and their interactions in a controlled environment. The broad Feshbach resonance of ^7Li atoms in the $|1, 1\rangle$ state allows us to tune the scattering length from positive to negative in order to produce quasi-1-D bright matter-wave solitons. In our work, we examine reflection and transmission of a degenerate gas at a repulsive barrier, derived from a near-resonant, cylindrically-focussed Gaussian beam, and the effect of interactions is explored by varying the scattering length.

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Jason Nguyen
Rice University

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