

Abstract Submitted  
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**Measuring the Speed of Sound in a 1D Fermi Gas**<sup>1</sup> JACOB FRY, YI JIN, ANNA MARCHANT, RANDALL HULET, Department of Physics and Astronomy and Rice Center for Quantum Materials — We have undertaken measurements of the speed of sound in a two-spin component, 1D gas of fermionic lithium. The 1D system is an array of one-dimensional tubes created by a 2D optical lattice. To measure the speed of sound, we create a localized density perturbation at the center of the atom cloud using a sheet of light. Depending on the laser's frequency, the atoms feel either a spin-sensitive or insensitive force<sup>2</sup>. Once the lightsheet beam is turned off, the density perturbation propagates to the edge of the atomic cloud with a velocity that depends on the strength of interatomic interactions, which we control using a magnetically-tuned Feshbach resonance. This method may be used to extract the Luttinger parameter vs. interaction strength. We will report our progress.

<sup>1</sup>ARO MURI, NSF, ONR, and The Welch Foundation

<sup>2</sup>A. Recati, P. O. Fedichev, W. Zwerger, and P. Zoller, Phys. Rev. Lett. 90, 020401 (2003).

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