

Abstract Submitted
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Measuring Spin-Charge Separation in a 1D Fermi Gas¹ JACOB A. FRY, MELISSA C. REVELLE, RANDALL G. HULET, Department of Physics and Astronomy and Rice Center for Quantum Materials, Rice University, Houston, TX 77005 — We present progress on measurement of spin-charge separation in a two-component, strongly interacting, 1D gas of fermionic lithium. A characteristic feature of interacting 1D Fermi gases is that the velocity of a charge excitation propagates faster than a spin excitation. We create an excitation by applying a dipole force at the center of the cloud using a sheet of light. Depending on the detuning of this beam, we can either excite both spin species equally (charge excitation) or preferentially (spin excitation)². Once this beam is turned off, the excitations propagate to the edges of the atomic cloud at a velocity determined by coupling strength. A magnetically tuned Feshbach resonance enables us to vary this coupling and map out the velocities of spin and charge excitations.

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

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