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Equation of State and Spin Transport in a Fermi Gas with Universal Interactions[1] ARIEL SOMMER, MARK KU, ANDRE SCHIROTZEK, MARTIN ZWIERLEIN, Massachusetts Institute of Technology — We present experiments on the equation of state and spin transport properties of degenerate two-component Fermi gases with interactions tuned in the vicinity of a Feshbach resonance. The density distribution in an external potential directly probes the equation of state under the local density approximation. Regions of low density allow us to extract the chemical potential and the temperature using the virial expansion of the equation of state. The experimental results are compared to recent Monte-Carlo calculations. Spin transport is observed by separating the spin components of a two-component Fermi gas and measuring the evolution of the system as it returns to equilibrium. We determine the spin relaxation rate as a function of interaction strength across the Feshbach resonance and estimate the spin diffusion coefficient.

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