

Abstract Submitted  
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**Shear Viscosity and the Perfectness of Fluid** GAUTAM RUPAK,  
THOMAS SCHAEFER, North Carolina State University — A recent calculation of the shear viscosity for a unitary gas is presented. Here unitary gas is defined as a non-relativistic Fermi gas with infinite scattering length. The unitary gas is a scale invariant strongly-interacting many-body system, and possesses universal properties that are of interest across subfields in physics. A unitary gas can be realized in cold atomic gas experiments near a Feshbach resonance. Conditions approximating the unitary gas emerge in low energy nuclear physics as well. From general principle, the shear viscosity of a strongly interacting gas should be small, however, quantum mechanics places a lower bound. A strict lower bound indicating how “perfect” a fluid can become has been conjectured from calculations in strongly coupled field theories that have a gravity dual. We test this conjecture with an explicit calculation in a unitary gas, the most strongly interacting non-relativistic system experimentally known.

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