Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Shock Waves in the BEC to BCS Crossover of a Fermi Gas[1] LORIN BAIRD, JAMES JOSEPH, JOHN THOMAS, North Carolina State Univ — We observe shock waves in a Fermi gas near a Feshbach resonance, using a micro-mirror array to create a spatially controlled, blue-detuned, repulsive optical potential. We separate an optically-trapped gas of ^{6}Li into two clouds with steep density profiles. When the repulsive potential beam is extinguished, the two halves of the cloud collide in the optical trap, producing shock waves. Using in-situ imaging, we find that the steep density gradients associated with shockwaves are most pronounced near resonance and become less pronounced as the magnetic field is tuned above resonance to create a weakly interacting Fermi gas or below resonance to create a weakly interacting Bose gas of dimers. Using this method, we study the crossover from dispersive to dissipative non-linear hydrodynamics as a function of interaction strength and temperature.

[1]Funding by: NSF, DOE, ARO, and AFOSR.

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Date submitted: 28 Jan 2016 Electronic form version 1.4