Abstract Submitted for the TSF07 Meeting of The American Physical Society

Phase Diagram of a Polarized Fermi Gas Across a Feshbach¹ WENHUI LI, Department of Physics and Astronomy and Rice Quantum Institute, Rice University, Houston, TX 77251, USA, YEAN-AN LIAO, GUTHRIE B. PAR-TRIDGE, R.G. HULET, Department of Physics and Astronomy and Rice Quantum Institute, Rice University — We investigate a Fermi gas of 6 Li atoms with unbalanced populations in two spin states, whose interactions are tuned by a Feshbach resonance. At the unitarity limit, we observe three distinct phases connected by a tricritical point on a polarization vs. temperature (P-T) phase diagram: a phase-separated state at low T, a polarized superfluid and a polarized normal gas at higher T. We are currently mapping out the phase diagram as a function of P, T and interaction. At T=0, as the interaction strength is tuned toward the BEC side of the resonance, we expect to encounter a phase boundary between the phase-separated state and the polarized superfluid. Conversely, on the BCS side, for finite P, a transition to the polarized normal gas is expected. We will present our latest results.

¹Supported by NSF, ONR, and The Welch and Keck Foundations.

Wenhui Li Department of Physics and Astronomy and Rice Quantum Institute, Rice University, Houston, TX 77251, USA

Date submitted: 05 Oct 2007 Electronic form version 1.4