

Abstract Submitted
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Direct Observation of Resonance Condensation in Imbalanced Fermi Mixtures¹ MARTIN W. ZWIERLEIN, ANDRE SCHIROTZEK, CHRISTIAN H. SCHUNCK, WOLFGANG KETTERLE, MIT — We directly observe pair condensation in an unequal mixture of resonantly interacting fermionic ^6Li atoms. Condensation is revealed by the sudden appearance of a bimodal density distribution in the minority spin component below a critical temperature. Already above the critical temperature for condensation, strong interactions between the two spin states are manifest in the deformed density distribution of the larger cloud. Temperatures can be directly determined from the non-interacting wings of the majority component. Beyond a critical population imbalance of 71(3)% on resonance, no condensates are observed, in agreement with our earlier observation of the Pauli limit of superfluidity. We show that for higher than critical imbalance, the central densities of the two components are no longer matched.

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