

Abstract Submitted
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Progress towards localization in the attractive Hubbard model W. MORONG, W. XU, B. DEMARCO, University of Illinois — The interplay between fermionic superfluidity and disorder is a topic of long-standing interest that has recently come within reach of ultracold gas experiments. Outstanding questions include the fate of Cooper pairs in a localized superfluid and the effect of disorder on the superfluid transition temperature. We report progress on tackling this problem using a realization of the Hubbard model with attractive interactions. Our system consists of two spin states of fermionic potassium-40 trapped in a cubic optical lattice. Disorder is introduced using an optical speckle potential, and interactions are controlled via a Feshbach resonance. We study the binding and unbinding of Cooper pairs in this system using rf spectroscopy, changes in T_c by measuring the condensate fraction, and transport properties by observing the response to an applied impulse. We will discuss progress towards these measurements.

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