

Abstract Submitted
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Dynamics of pair correlations in a strongly interacting polarized Fermi gas CHRIS LUCIUK, STEFAN TROTZKY, SCOTT BEATTIE, ALMA BARDON, University of Toronto, EDWARD TAYLOR, McMaster University, SHIZHONG ZHANG, University of Hong Kong, JOSEPH THYWISSEN, University of Toronto — Radio-frequency (rf) spectroscopy has been used to measure the chemical potential, the molecular binding energy, the quasiparticle dispersion relation, and the contact of Fermi gases in equilibrium. Here we present a dynamic study of Fermi-degenerate ^{40}K that is initially fully polarized in a superposition of two hyperfine states. A magnetic field gradient, combined with transverse spin diffusion, causes the gas to demagnetize. We present results of time-resolved rf spectroscopy, used to observe both contact dynamics at unitarity and the formation of molecular dimers below the Feshbach resonance. The time variation of contact shows how an ideal gas dynamically evolves into a strongly correlated mixture. Molecular dynamics allow us to delineate a metastable regime of repulsive atomic interactions.

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