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Non-Equilibrium Dynamics of Fermi Gases Near A Scattering Resonance S. TROTZKY, C. LUCIUK, S. SMALE, University of Toronto, S. BEATTIE, National Research Council of Canada, E. TAYLOR, University of Toronto, T. ENSS, University of Heidelberg, SHIZHONG ZHANG, Univeristy of Hong Kong, J. H. THYWISSEN, University of Toronto — We present recent dynamic measurements of fermionic potassium (^{40}K) near Fano-Feshbach scattering resonances. In our experiments, we start with a weakly or non-interacting Fermi gas and initiate strong interactions on a timescale that is fast compared to the equilibration mechanisms in the system quasi-instantaneous quench. Equally fast measurements allow us to follow the non-equilibrium many-body dynamics. First, we discuss time-resolved radio-frequency (rf) spectroscopy, and its use to probe the evolution of the short-range part of the many-body wave function – i.e., the contact. Second, we discuss spin-echo measurements that reveal the nature of transverse spin transport. Most recently, we have studied a Fermi gas with repulsive interactions in the metastable upper branch of the energy spectrum near a s-wave scattering resonance.

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