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Relaxation dynamics in the Fermi-Hubbard model WENCHAO XU, WILLIAM MCGEHEE, WILLIAM MORONG, BRIAN DEMARCO, University of Illinois at Urbana-Champaign, DEMARCO GROUP TEAM — We report measurements of spin-excitation relaxation rates for ultracold 40K atoms trapped in an optical lattice in the metallic regime of the Hubbard model. A spin-polarized gas is prepared in a well-defined state in a cubic optical lattice. Via a quasimomentum-selective Raman pulse, atoms are transferred into another spin state with non-zero center-of-mass momentum. The timescale for relaxation of this excitation is measured as the temperature and lattice potential depth are varied. Non-Fermi liquid behavior is revealed in both the temperature and interaction-strength dependence.

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