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Elastic decay of doublons in the Fermi-Hubbard model DANIEL GREIF, NIELS STROHMAIER, ROBERT JORDENS, LETICIA TARRUELL, HENNING MORITZ, TILMAN ESSLINGER, ETH Zurich — Investigating the non equilibrium physics of a strongly correlated many-body system is amongst the most challenging tasks in modern physics. In the specific case of the Fermi-Hubbard model, which captures many intriguing phenomena in condensed matter physics such as high-temperature superconductivity, only limited theoretical understanding of the dynamics could be gained so far. Furthermore, coupling to the environment often disguises the main equilibration process. Ultracold atoms in optical lattices offer a very clean approach to study condensed matter systems. We study out-of-equilibrium dynamics of the repulsive Fermi-Hubbard model by exciting particle-hole pairs. The dominant physical mechanism leading to the decay of these doublons is found to be a high order scattering process, where the decay time scales exponentially with the ratio of interaction and kinetic energy.

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