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Dynamics of interacting fermions in optical lattices JASPER SIMON KRAUSER, JANNES HEINZE, NICK FLÄSCHNER, SÖREN GÖTZE, CHRISTOPH BECKER, KLAUS SENGSTOCK, Institute of Laser Physics, University of Hamburg, BFM TEAM — Quantum gases in optical lattices offer a wide range of applications for quantum simulation due to fully tunable lattice and atomic interaction parameters. In particular fermions are of high interest due to their resemblance with conventional solid state systems. In this poster, we present results on ultracold fermionic quantum gases of ^{40}K in optical lattices. We investigate the excitation spectrum with full momentum resolution and resolve an interaction-induced shift of the band structure. The excited particle-hole pairs show confinement-induced higher orbital dynamics in good agreement with a single particle model. To tune the interaction between the fermions, we explore Feshbach resonances in different binary mixtures. We study stable or unstable mixtures and observe a variety of resonances in good agreement with calculations. Our results open new perspectives to study dynamical properties of interacting Fermi spin-mixtures in lattice systems.

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