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Quantum Quenches of Ultracold Atoms in the Presence of Synthetic Gauge Fields[1] MATTHEW KILLI, STEFAN TROTZKY, ARUN PARAMEKANTI, University of Toronto — Motivated by the experimental realization of synthetic gauge fields for ultracold atoms in optical lattices, we consider quantum quenches in such gauge field backgrounds. We show that the density dynamics following sudden anisotropic quenches can be used as a probe of equilibrium mass currents of atoms. We show, using diverse examples of Bose superfluids and normal Fermi fluids, that bulk equilibrium currents produced by the background gauge fields can be uncovered using this method. Such quenches are also shown to provide an effective route to probing the edge currents in topological states such as quantum Hall or quantum spin Hall insulators.

[1]NSERC

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