

Abstract Submitted
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Non-equilibrium dynamics of atomic Fermi and Bose gas under lattice geometry transformation CHEN-YEN LAI, CHIH-CHUN CHIEN, Univ of California - Merced — The tunability of ultra-cold atom experiments has provide a new arena of exploring quantum effect in both bosonic and fermionic system in and out of equilibrium. According to recent experiments [Phys. Rev. Lett. 108, 045305 (2012).], a triangular lattice can be dynamically tuned into a square or kagome lattice by adjusting frequency and focus point of laser beams. We simulate the dynamical properties of single component fermions and weakly interacting bosons under various transformation processes, including different ramping time scales, different ramping functions, and more importantly into different types of lattice geometry. A non-equilibrium steady state, which is not thermalized, is found in single component fermion system under different particle densities in both small size system and in the thermodynamic limit. In contrast, weakly interacting bosons do not exhibit observable steady state behavior. This opens new opportunities of research on dynamical multi-band effects.

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