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Title: Topological Phase Space Lattice Waves

Abstract: Phase space crystal is the solid-like many-body state of interacting time crystals. In this talk, we investigate the lattice waves of a crystal in phase space with a honeycomb lattice, which is created by properly periodically driven one dimensional (1D) quantum gas. Compared to the lattice waves of solid crystals, the phase space lattice waves have intrinsic topological properties due to its symplectic dynamics. Our model realises 2D topological phenomena with 1D physical system. Different from the synthetic dimension methods, the momentum dimension in our model is not another independent degree of freedom but a conjugate dimension of position dimension. Our work provides a new platform to study topological physics in dynamical systems.