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【407】 Topological pump of ultracold fermions in a one dimensional Floquet optical lattice

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Topological pumps allow robust quantized transport of particles in periodic potentials. Their topological origin is analogous to the quantum Hall effect. In atomic physics, ultracold atoms in optical lattices are versatile systems to observe such effects. Yet, charge pumping has been limited to super-lattices operating with a sliding potential. Here, we experimentally realize a topological pump of ultracold fermions in a simple one dimensional optical lattice. The optical lattice is resonantly shaken to prepare the fermions in a topological Floquet-Bloch band. Pumping is achieved by periodically modulating the shaking waveform slow enough to ensure adiabaticity. Our results pave the way for observing topological pumps in Floquet-Bloch bands in real materials.

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