

Abstract Submitted
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Direct observation of edge states in the Su-Schrieffer-Heeger model with bosonic atoms in a momentum space lattice ERIC MEIER, FANGZHAO AN, BRYCE GADWAY, University of Illinois at Urbana-Champaign — We experimentally probe topological systems within the AIII symmetry class, using ultracold atomic matter waves in a momentum-space optical lattice. By writing multiple frequency sidebands on one of our optical lattice laser beams, we couple sites in the resulting momentum-space lattice through stimulated Bragg diffraction. With time-dependent control of the frequency, amplitude, and phase of each laser sideband we are able to locally and dynamically control all system parameters and simulate fully tunable topological systems. We demonstrate this ability through the realization of the Su-Schrieffer-Heeger model in a one-dimensional optical lattice and observe evidence of the predicted dispersionless edge state in the matter wave dynamics therein.

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