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Many-body effects in momentum-space lattices[1] FANGZHAO AN, ERIC MEIER, BRYCE GADWAY, University of Illinois at Urbana-Champaign — Nonlinear interactions, when added to a tight-binding lattice system, can result in many interesting phenomena. The physics of such a lattice model can be described in terms of a bosonic Josephson junction array, allowing for the study of phenomena similar to those found in tunnel-coupled superconductors. Using a lattice made of coupled momentum states, we show measurements progressing towards the full Josephson array. By tuning the effective interaction strength, we observe the onset of self-trapping in a one-dimensional lattice, and further show collective Bloch oscillations on a tilted array.

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