

Abstract Submitted  
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**Observation of a low-loss radiofrequency-dressed optical lattice in the tight-binding regime** NATHAN LUNDBLAD, EDWARD MOAN, SAAD ANSARI, YANG GUO, Bates College — Traditional optical lattices are limited in length scale to approximately half a wavelength of the lattice laser; the ability to tailor a lattice’s periodicity, band structure, and Wannier functions would be a significant aid in using optical lattices to explore analogous solid-state physics. One pathway to lattice modification is the use of radiofrequency dressing to create adiabatic potentials of novel geometry from “bare” spin-dependent lattices of traditional geometry. We present measurements made on a one-dimensional radiofrequency-dressed optical lattice in the new regime where the dressed lattice is both tight-binding and long-lived. Momentum distributions, loss rates, and dressed-state spin populations are explored. The bare lattices are sufficiently deep and the rf coupling sufficiently strong such that the adiabatic potentials should prove useful for any experiment exploring novel optical lattice geometries.

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