Abstract Submitted
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Floquet engineering from long-range to short-range interactions TONY LEE, Indiana University-Purdue University Indianapolis — Quantum simulators based on atoms or molecules often have long-range interactions due to dipolar or Coulomb interactions. We present a method based on Floquet engineering to turn a long-range interaction into a short-range one. By modulating a magnetic-field gradient with one or a few frequencies, one reshapes the interaction profile, such that the system behaves as if it only had nearest-neighbor interactions. Our approach works in both one and two dimensions and for both spin-1/2 and spin-1 systems. It does not require individual addressing, and it is applicable to all experimental systems with long-range interactions: trapped ions, polar molecules, Rydberg atoms, nitrogen-vacancy centers, and cavity QED. Our approach allows one achieve a short-range interaction without relying on Hubbard superexchange. [1] T. E. Lee, Phys. Rev. A 94, 040701(R)

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