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Production and Control of Subradiant States in Optical Lattices[1]
RODRIGO ARAIZA BRAVO, SUSANNE YELIN, Harvard University — The study of dense atomic systems with photon-photon mediated interactions are of uttermost interest in the fields of atomic physics and quantum information science. Subradiant states in dipole-dipole interacting optical lattices are of interest, since, due to collective effects, they possess decay rates far smaller than that of a single atom. Here, we present strategies for subradiant state preparation and analyze the conditions necessary for steady state subradiance in a dissipative driven optical lattice both in vacuum and inside an optical cavity. Our work paves the way towards control of long-lived atomic excitations for the storage of quantum information.

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