Abstract Submitted
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Studying matter-wave emission with ultracold atoms in an optical lattice[1] ARTURO PAZMINO, JOONHYUK KWON, LUDWIG KRINNER, MICHAEL STEWART, DOMINIK SCHNEBLE, Dept. of Physics and Astronomy, Stony Brook University — We report experimental and theoretical progress on the implementation of the Weisskopf-Wigner Hamiltonian in an optical lattice scenario. In our system, lattice-trapped atoms are coupled to a continuum of freely moving, untrapped states via an internal state transition. This fully tunable system allows for studies of a plethora of effects including the transition from Markovian to non-Markovian decay and evanescently bound matter-waves. Recent technological advancements in our labroatory, including the development of a blue-detuned optical lattice and a method to measure magnetic fields to high accuracy, will allow for the exploration of new regimes in these models, especially many-body effects such as superradiant dynamics and extended range (tunneling) Hubbard models.

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