

Superradiance in Linear Chain of Atoms

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The superradiance phenomenon, which is the decay of excited atoms due to collective effects, has garnered significant interests due to its ubiquity and potential applications in various atomic platforms. In this work, we investigate superradiance from a linear chain of atoms in the quantum trajectory framework. We observe that the emission rate is maximized when the interatomic distances are uniform, and that any dimerization would weaken the superradiant burst. Yet, we found that dimerization would lead to larger critical distances, on the order of the wavelength of the light, for achieving superradiance. These properties make the dimerized model a more practical candidate for realizing superradiance experimentally due to its higher distance threshold.