

Abstract Submitted
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Dimension control of Superradiance TYLER HILL, University of Michigan, HUI DENG COLLABORATION¹, BARRY C. SANDERS COLLABORATION² — We develop a theory for quantum dipole-dipole coupling when the electromagnetic fields are confined to an open line, open plane, or open space, commensurate with experimental capability for collective atomic effects subject to dimensional confinement. Our mathematical model naturally interpolates for all real dimension between one dimension for the line to three dimensions for open space. We show how superradiant emission can be controlled by dimensional confinement, including near-field and dipole-orientation effects, and we propose a two-dimensional confinement experiment to test our theory's efficacy.

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