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Geometry dependent suppression of collective quantum jumps in Rydberg atoms EITAN LEES, JAMES CLEMENS, Miami University — We consider N driven, damped Rydberg atoms in different spatial arrangements. Treating the atoms as two-level systems we model the coupling to the environment via the Lehmberg-Agarwal master equation which interpolates between fully independent and fully collective spontaneous emission depending on the specific locations of the atoms. We also include a collective dipole-dipole energy shift in the excited Rydberg state which leads to collective quantum jumps in the atomic excitation when the system is driven off resonance. We show that the quantum jumps are suppressed as the system makes a transition from independent to collective emission as the spacing of a linear array of atoms is decreased below the emission wavelength.

James Clemens
Miami University

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