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Suppression of collective quantum jumps in Rydberg atoms by collective spontaneous emission LYNDON CAYAYAN, JACOB PAULEY, JAMES CLEMENS, Miami University — We consider a system of driven, damped Rydberg atoms with dipole-dipole energy shifts which can give rise to Rydberg blockade when the atoms are driven on resonance and collective quantum jumps when the atoms are driven off resonance. For the damping we consider both independent and collective spontaneous emission. For independent emission a quasiclassical model predicts a bistable steady state and quantum fluctuations drive collective jumps between the two bistable branches. We show that collective spontaneous emission strongly suppresses the bistability and therefore suppresses the collective quantum jumps.

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