

Abstract Submitted
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Long-range spatial correlations in a driven-dissipative system of Rydberg atoms ANZI HU, Joint Quantum Institute, University of Maryland and National Institute of Standards and Technology, TONY LEE, ITAMP/Harvard, CHARLES CLARK, Joint Quantum Institute, University of Maryland and National Institute of Standards and Technology — We consider a one-dimensional lattice of atoms with laser excitation to a Rydberg state and spontaneous emission. The atoms are coupled due to the dipole-dipole interaction of the Rydberg states. This driven-dissipative system has a broad range of non-equilibrium phases, such as bistability. Using the quantum trajectory method, we calculate the spatial correlation function throughout the parameter space. Our results show that there are long-range correlations in the bistable region, despite the low dimensionality and the presence of dissipation. We compare and contrast our results with known equilibrium results.

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