

Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Sympathetic Cooling of Quantum Simulators¹ MEGHANA RAGHUNANDAN, HENDRIK WEIMER, Institut für Theoretische Physik, Leibniz Universität Hannover — We discuss the possibility of maximizing the cooling of a quantum simulator by controlling the system-environment coupling such that the system is driven into the ground state. We make use of various analytical tools such as effective operator formalism ² and the quantum master equations to exactly solve the model of an Ising spin chain consisting of N particles coupled to a radiation field. We maximize the cooling by finding the dependence of the effective rate of transitions of the various excited states into the ground state. We show that by adding a single dissipative qubit, we already get quite substantial cooling rates.

¹Volkswagen Foundation, DFG

²F. Reiter et al, **Phys. Rev. A** **85**, **032111** 161, 1500

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Date submitted: 26 Jan 2017

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