

# SFB 767 Seminar

Tue Oct 1, 2019  
10:00  
P 812

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## Reservoir engineering for many-body physics with arrays of superconducting qubits

Recent advancements in engineered quantum systems and engineered dissipation give new and promising ways of studying quantum systems. Different approaches using exchange coupling between the system and the engineered reservoir were used to stabilize the system in a certain state.

We study an array of superconducting qubits tunnel coupled to each other and intensity-intensity coupled to a microwave cavity functioning as the engineered reservoir. The coupling to the reservoir conserves the number of excitation on the chain giving rise to interesting dissipative dynamics.

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In the classical limit we find that the complex amplitudes converge to limit cycles in the complex plane. The convergence is explained by a retardation effect due to the coupling to the cavity. After this we show when the quantum evolution of the qubit array can be described by a master equation in Lindblad form. Investigating the long time limit we see that a coupling of this form can possibly be used to stabilize non-trivial states.

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