



Contribution ID: 52

Type: **Talk**

【415】 Cavity-QED Quantum Simulator of Random Spin Models

Thursday, June 30, 2022 6:00 PM (15 minutes)

I will present the results obtained with our cavity-QED experiment, where we trap fermionic Lithium atoms in an optical resonator to perform quantum simulations.

I will focus on the simulation of random spin models with long-range spin-exchange interactions. We implement these models by trapping a chain of atoms with tunable random transition frequencies in a cavity. The tunability is achieved by locally light-shifting the excited state of the atoms. In this scenario, we studied the competition between the collective many-body physics and disorder.

Furthermore, I will discuss possible perspectives of using our light-shifting technique for the quantum simulation of holographic matter such as the SYK model.

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Session Classification: Atomic Physics and Quantum Optics

Track Classification: Atomic Physics and Quantum Optics