

CP-01-03

Quantum science with tweezer arrays

Manuel Endres*Caltech*

Abstract

I will give an update on experiments in our group on quantum computing/simulation with Rydberg arrays based on two valence electron atoms. The rich level structure of such atoms enables novel cooling, control, and read-out schemes. First, I will show our latest results on creating Bell states with ~ 0.9985 fidelity and associated error budget. Second, I will give an overview on benchmarking a 60-atom quantum simulation in terms of the fidelity for reaching maximum entanglement entropy states. I will also show new results for quantifying the amount of mixed state entanglement in this system. If time permits, I will show results on novel cooling, control and entanglement of motional states in tweezers.