

Scalable all-electronic quantum control of trapped-ion qubits

Monday 8 July 2024 12:12 (22 minutes)

Building useful quantum computers means making them better as well as bigger. At Oxford Ionics we replace the lasers conventionally used to manipulate ion qubits with electronics integrated directly into trap chips, which allows us to reach very low error rates in a highly scalable architecture.

Our all-electronic architecture combines laser-free gates with local tuning of electric potentials to enable site-selective single- and two-qubit operations in a multi-zone quantum processor. Integrated antennas deliver control fields common to all qubits, while voltages applied to local tuning electrodes adjust the position and motion of ions in each zone, thus enabling local coherent control.

Author: WEBER, Marius (University of Oxford)

Presenter: WEBER, Marius (University of Oxford)

Session Classification: Quantum Information & Computing