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Recent Advances Toward a More Capable Trapped Ion Quantum Computer

Patty Lee

Quantinuum

Abstract

Critical applications of quantum computation require higher performance than today's quantum computers can provide. Towards that end, Quantinuum has continued to improve the performance of H-Series quantum computers in the past year, by increasing the fidelity of quantum operations and the number of qubits in H1 systems, to achieve a Quantum Volume of 8192. With the updated hybrid computing feature, we embarked on fault-tolerant quantum computing by entangling two logical qubits on H1. Additional breakthroughs including junction transport, state preparation and measurement fidelity improvements, and a qubit re-use compiler pave the way to scaling up to larger and more capable quantum computers.