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Quantum information processing with trapped ions

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Abstract

Trapped-ions are among the leading systems for quantum computing, offering the highest accuracy gate operations and long coherence times. Nevertheless, along with all candidate technologies, they face the considerable scaling challenge of transitioning from systems of tens of qubits to hundreds of thousands. I will describe the state of the field, in the context of experiments performed in our group which focus on challenges and possible solutions for scaling up. This includes new technological approaches to delivering light as well as novel methods of trapping or encoding information.