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Scaling up quantum computing with silicon quantum dots

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Abstract

Spin qubits hosted in silicon-based devices have excellent initialisation, control and readout fidelities in small scale demonstrations [1-3]. A silicon foundation lends itself to large-scale manufacturing [4-6], where in principle millions of qubits can be integrated into a single chip, however this is not readily achievable using the same processes commonly used for current spin qubit devices. Moreover, the translation of modern designs to commercially available processes is nontrivial and requires careful consideration of the design constraints and parameters available. This talk will present Quantum Motion's effort to develop reproducible and scalable silicon spin qubits with a focus on mass characterisation to increase cryogenic measurement throughput.