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Benchmarking the Success of Scaling

Estimating performance of multi-qubit superconducting circuits is an involved task. Knowing which metrics of performance are relevant and how they scale is an important consideration when trying to increase the number of qubits available on a quantum processor. Numbers alone are not enough, ensuring that coherence of qubits and fidelity of operation are maintained while scaling can be equally as important. Existing measures such as randomized benchmarking are useful, but do not tell the whole story. When investigating structured algorithms the particular type of noise matters and average fidelity does not necessarily match to the observed outcomes. In this talk I will discuss our ongoing scaling efforts at Chalmers and our understanding of the limitations of our architecture.