

Construction of Superconducting Qubit Arrays Suitable for Demonstrating Quantum Supremacy

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A useful quantum computer should be able to solve well-defined problems that are intractable to state-of-the-art classical systems, a milestone known as “quantum supremacy”. An experiment that demonstrates this involves applying pseudo-random quantum operations to an array of qubits and checking the outcome with a classical simulation. Outperforming the world’s largest classical supercomputers requires arrays of around 50 qubits with high fidelity logic operations. I will describe our progress on developing 2D arrays of Xmon transmon qubits with the numbers needed to achieve quantum supremacy, as well as the control systems needed to operate these devices with high fidelity.