

Quantum Computing with Superconducting Circuits

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Abstract

Quantum computing is a rapidly emerging technology using the same physical rules that atoms follow to manipulate information. At this fundamental level, quantum computers execute quantum circuits - like a classical computer's logical circuits - but now using the physical phenomena of superposition, entanglement, and interference. At maturity quantum computers hold the promise of implementing mathematical calculations that are out of reach for even our most advanced supercomputers. In this talk I will present an introduction to quantum computing using superconducting circuits from the anatomy of a single superconducting qubit to a description of the largest superconducting circuit device we have developed at IBM of 127 qubits. Applications and outlook will also be discussed.