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(54) Title of the invention : Quantum Computing System and Method using Superconducting Qubits with Optimized Qubit Coupling and Error Correction

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(57) Abstract :

The invention provides a quantum computing system and method using superconducting qubits with optimized qubit coupling and integrated error correction. The system employs tunable coupling mechanisms to enable precise multi-qubit interactions while minimizing crosstalk and decoherence. Advanced error correction protocols detect and correct bit-flip and phase-flip errors in real time, maintaining logical qubit fidelity. Adaptive control and calibration techniques enhance operational reliability. The architecture is scalable, supporting modular qubit arrays for executing complex quantum algorithms in simulation, optimization, and cryptography, enabling practical, high-fidelity superconducting quantum computation. Accompanied Drawing [FIG. 1]

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