

Quantum Errors Just Got a New Defense

A novel flag system protects bosonic codes from ancilla decay — without new hardware.

Swipe for insights →

more than three orders of magnitude fewer logical errors

Logical Error Reduction

In simulations of a four-component cat code, the new flag-based scheme drastically reduces error propagation.

This reduction is achieved not by adding more qubits or increasing hardware complexity, but by introducing a continuous-variable flag that detects and corrects errors caused by ancilla decay during gate operations. The scheme leverages existing circuit-QED components, making it immediately deployable in superconducting and trapped-ion platforms.



01

Flags Don't Fix Errors — They Predict Them

By discretizing continuous errors through heterodyne measurement, the flag transforms analog noise into a discrete, correctable signal — a bridge between analog quantum systems and digital error correction frameworks.



02

One Flag, Infinite Orders of Protection

For conditional displacements, the scheme achieves first-order protection with one flag and full-order protection with two — a clear path toward efficient, scalable fault tolerance without sacrificing performance in low-decoherence regimes.

MIT, Nvidia, Google & IBM-Trained. Cross Domain-Expert: Quantum, AI, Ethics, Sovereignty, Intelligence, Philanthropy.
Solepoint Planning. VUI AI Cloud Architect. AI Certifications Development. Quant/AI Instructor. Castor Venture Club Member.
Associate Broker.

George Arnold Alexander III, MPA

Director, ALEX Companies

Associate Broker, Alexander Tiffany Southwest, LLC dba ALEX.realestate, et.al.

Texas License #574878-B · Broker License #565194-BB

Broker, ALEX Real Estate · North Carolina License #367733

Independent Broker, ALEX Real Estate · Colorado License #II.100112456

george@alex.realestate · +1 713.918.9951



ALEX

ALEX Intelligence
deep intelligence

ALEX Real Estate
genius real estate

ALEX Advisory
uncontested strategy

ALEX Cares
purposeful philanthropy

