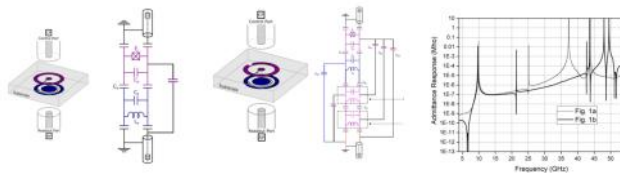


Quantum computing designs with increased qubit lifetimes

Applied microwave engineering concepts to develop method to engineer wideband Purcell filtering without the need to add additional circuits.

Circuit quantum electrodynamics (cQED) is a promising platform for quantum computing, enabling the preparation of stable quantum states with good lifetimes. Oxford have applied microwave engineering concepts to develop method to engineer wideband Purcell filtering without the need to add additional circuits.

Applications: Quantum Computing



Features	Benefits
Addition of symmetry breaking features (i.e. Fig 1b) to conventional Transmon qubits produces interference effects and/or additional functionality	Significantly improves the qubit relaxation time and reduces operational errors in the quantum processor by suppressing the Purcell effect
The interference effects can produce a transmission minima (Fig 2) at the qubit frequencies	Removes the need for a physical circuit or other devices to Purcell filter qubit frequencies
Different positions and geometrical arrangements of the symmetry breaking feature allows a range of functionality to be introduced into the cQED device	Simplifies quantum processor design and facilitates scaling up the system to accommodate more qubits with flexible connectivity and reduced crosstalk

Features	Benefits
Oxford's simulation tools enable calculation of well-defined features that achieve target interference and functionality for a given cQED device	The fabrication of cQED devices with geometric symmetry breaking features is easily controlled, reproducible and low-cost

Patented and Available for

- Co-development
- Consulting
- Licensing

To find out more, contact enquiries@innovation.ox.ac.uk and quote the project number.

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