

## Charge Qubit Storage and Its Engineered Decoherence via Microwave Cavity

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**Abstract:** We study the entanglement of the superconducting charge qubit with the quantized electromagnetic field in a microwave cavity. It can be controlled dynamically by a classical external field threading the SQUID within the charge qubit. Utilizing the controllable quantum entanglement, we can demonstrate the dynamic process of the quantum storage of information carried by charge qubit. On the other hand, based on this engineered quantum entanglement, we can also demonstrate a progressive decoherence of charge qubit with quantum jump due to the coupling with the cavity field in quasi-classical state.

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**Key words:** charge qubit, engineered decoherence, quantum information storage, microwave cavity

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