

**Abstract Title****Decoherence and Entanglement in Superconducting Qubits****Symposium Track***2. Modeling of Structures and Behaviors at the Nanoscale (Chikako Uchiyama)***Authors' names***Saverio PASCAZIO***Authors' affiliations***Physics Department, University of Bari, Italy***Abstract body**

**Entanglement** is one of the most intriguing features of quantum mechanics. It is widely used in quantum communication and information processing and plays a key role in quantum computation. **Decoherence** due to the interaction with the environment is very detrimental against the preservation of entanglement over long times.

We briefly introduce the notions of entanglement and decoherence and then explore three different strategies, all aimed at controlling and eventually halting decoherence. We compare these three strategies and focus on a case of great practical relevance, that of coupled superconducting qubits (Josephson junctions). The problem is framed in the context of quantum computation.

**Keywords**

Quantum mechanics, entanglement, decoherence, control, quantum computation

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