

Modeling Three- and Four- Coupled Phase Qubits

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Abstract—The Josephson junction phase qubit has been shown to be a viable candidate for quantum computation. In recent years, the two coupled phase system has been extensively studied theoretically and experimentally. We have analyzed the quantum behavior of three and four capacitively-coupled phase qubits with different possible configurations, using a harmonic oscillator model. Energy levels and eigenstates have been calculated as a function of bias current and detuning. The properties of these simple networks are discussed.

Index Terms—Coupled phase qubits, Josephson junction, quantum computing, quantum entanglement.

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