

Microwave readout scheme for a Josephson phase qubit

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We present experimental results on a microwave scheme for reading out a Josephson phase qubit. A capacitively shunted superconducting quantum interference device (SQUID) is used as a nonlinear resonator which is inductively coupled to the qubit. The flux state of the qubit is detected by measuring the amplitude and phase of a microwave pulse reflected from the SQUID resonator. By this low-dissipative method, the qubit state measurement time is reduced to 25 μs , which is much faster than the conventional readout performed by switching the SQUID to its nonzero dc voltage state. The readout scheme presented here allows for reading out multiple qubits using a single microwave line by employing frequency-division multiplexing.

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