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Continuous Impedance measurement of a Superconducting Flux Qubit

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We implement the radio-frequency technique for characterization of superconducting qubits and for measuring their states. In the framework of this method, the qubit is inductively coupled to a high-quality tank circuit. We show that this technique is a powerful tool to study a response of externally controlled superconducting qubit to different types of excitations. Conclusive information about qubits is obtained from the read out of the tank properties. We also show that the tank circuit can be effectively used to monitor an adiabatic evolution of the superconducting flux qubits. By making use the radio- frequency technique the qubit's state can be determined, moreover such kind of measurements belong to the class of quantum nondemolition measurement.