Multiplexed Phase qubit readout using SQUID-resonators

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We are developing a SQUID-resonator readout method that addresses all three of these limitations. By operating the SQUID as a resonator, we can measure the state of the qubit quickly (on the order of its coherence time), we can multiplex resonant readout lines, and we can operate on the SQUID’s supercurrent branch eliminating dissipation and decohering radiation. This faster, quieter readout should allow us to use measured results for real-time quantum feedback.