Flux qubit on mesoscopic nonsuperconducting ring

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The possibility of making a flux qubit on nonsuperconducting mesoscopic ballistic quasi 1D ring is discussed. We showed that such ring can be effectively reduced to a two-state system with two external control parameters. The two states carry opposite persistent currents and are coupled by tunneling which leads to a quantum superposition of states. The qubit states can be manipulated by resonant microwave pulses. The flux state of the sample can be measured by a SQUID magnetometer. Two or more qubits can be coupled by the flux the circulating currents generate.

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