

# Detection of Quantum Noise from an Electrically-Driven Two-Level System

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The electrical noise of mesoscopic devices can be strongly influenced by the quantum motion of electrons. To probe this effect we have measured the current fluctuations at high-frequency (5-90 GHz) using a superconductor-insulator-superconductor tunnel junction as an on-chip spectrum analyser. By coupling this frequency-resolved noise detector to a quantum device we can measure the high-frequency, non-symmetrized noise as demonstrated for a Josephson junction. The same scheme is used to detect the current fluctuations arising from coherent charge oscillations in a two-level system, a superconducting charge qubit. A narrow band peak is observed in the spectral noise density at the frequency of the coherent charge oscillations.