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【531】 Shot-noise of high-impedance quantum devices using impedance matching

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High-impedance devices, such as quantum devices, are difficult to measure fast, due to the large impedance mismatch between the quantum device and 50 Ohm wave impedance of RF circuits. Fast and reliable read-out requires impedance matching, which is achieved through a resonant circuit. We compare two approaches, a) a lumped LC- and b) transmission line resonator on a quantum dot (QD) of which we measure its shot noise. We have tested the two approaches on QDs defined in a single carbon nanotube. We typically find suppressed shot-noise as expected for and in agreement with sequential tunneling through a QD. However, we also find regions of enhanced shot noise within and outside of Coulomb-blockade (CB). We explain this by blocking states.

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